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EVALUATION

Of the EU Biodiversity Strategy to 2020

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ABBREVIATIONS/GLOSSARY

AECM	*Agri-environment-climate measures*
B@B	*EU Business and Biodiversity Platform*
BEST	*Biodiversity and Ecosystem Services in Territories of European Overseas*
BISE	*Biodiversity Information System for Europe*
CAP	*Common Agricultural Policy*
CBD	*Convention on Biological Diversity*
CFP	*Common Fisheries Policy*
CGBN	*Coordination Group for Biodiversity and Nature*
CIF	*Common Implementation Framework*
CMEF	*Common Monitoring and Assessment Framework*
EAFRD	*European Agricultural Fund for Rural Development*
EASIN	*European Alien Species Information Network*
ECA	*European Court of Auditors*
EDF	*European Development Fund*
EEA	*European Environment Agency*
EFA	*Ecological Focus Areas*
EMFF	*European Maritime and Fisheries Fund*
EP	*European Parliament*
ESPG	*Environmentally sensitive permanent grassland*
EU	*European Union*
FLEGT	*Forest Law Enforcement, Governance and Trade*
FTE	*Full-time equivalent (jobs)*
GAEC	*Good agricultural and environmental conditions*
GES	*Good Environmental Status*
IAS	*Invasive alien species*
ILO	*International Labour Organisation*
IPBES	*Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services*
KIP – INCA	*Knowledge Innovation Project on Natural Capital Accounting in the EU*
MAES	*Mapping and Assessment of Ecosystems and their Services*
MPA	*Marine Protected Areas*
MSFD	*Marine Strategy Framework Directive*
MSY	*Maximum Sustainable Yield*
NBSAP	*National Biodiversity Strategy or Action Plan*
NCA	*Natural Capital Accounting*
NGO	*Non-Governmental Organisation*
OPC	*Online Public Consultation*
PAF	*Prioritised Action Framework*
PES	*Payments for ecosystem services*

RDP	*Rural Development Programme*
RPF	*Restoration Prioritisation Framework*
SDGs	*Sustainable Development Goals*
SEBI	*Streamlined European Biodiversity Indicators*
SFM	*Sustainable Forest Management*
SOER	*State of the Environment and Outlook Report*
TAC	*Total Allowable Catch*
TSD	*Trade and Sustainable Development*
WFD	*Water Framework Directive*

1. 1. INTRODUCTION

This is an evaluation of the EU Biodiversity Strategy to 2020[1], which provided the EU biodiversity policy framework for 2011-20. It was guided by the EU 2050 vision for biodiversity and the EU 2020 headline biodiversity target, endorsed by the EU Heads of State and Government in 2010[2].

1.1. 1.1. Purpose of this evaluation

This evaluation examines the performance of the EU Biodiversity Strategy to 2020 in line with Better Regulation Guidelines[3]. Its purpose is to provide lessons that will help improve the design and implementation of EU biodiversity policies beyond 2020.

At the end of 2019, the Commission published a communication on the European Green Deal[4] – Europe's new sustainable growth strategy. The Green Deal reset the EU's commitment and laid out an ambitious agenda for tackling the ecological and climate crises in the EU, as well as to show leadership by example at global level[5].

As part of this agenda and the political mandate that arose from it – to urgently strengthen the EU framework for biodiversity action – in May 2020 the Commission published an EU Biodiversity Strategy for 2030[6]. Work on this new strategy took place in parallel with the evaluation of the preceding policy period.

Section 6.3 of this report highlights lessons from the previous policy period that have been reflected in the design of the Strategy for 2030, as well as in key initiatives for its implementation.

The findings from this evaluation have further informed, or will inform, the development of measures announced in the Strategy for 2030, such as a proposal for legally binding EU nature restoration targets, an enhanced EU biodiversity governance framework and measures to increase the effectiveness of EU external action to support global biodiversity.

1.2. 1.2. Scope of the evaluation

This evaluation covers the full scope of the EU Biodiversity Strategy to 2020, including implementation of its six operational targets, 20 actions and horizontal measures in 2011-20. It also assesses the extent to which they have delivered the EU 2020 headline biodiversity target: to halt and reverse the loss of biodiversity and ecosystem services in the EU, and to help avert global biodiversity loss.

The evaluation applies five criteria to assess the Strategy: effectiveness, efficiency, coherence, relevance and EU added value.

It takes stock of achievements in implementing the Strategy at the EU level and in the Member States (EU-27+UK[7]), depending on the level(s) at which each specific biodiversity action was to be implemented.

It reflects on the factors that have enabled progress, as well as implementation challenges and the likely underlying causes. It reviews available evidence of significant

[1] Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (COM/2011/244 final).
[2] Biodiversity: Post-2010 EU and global vision and targets - Council Conclusions of 15 March 2010.
[3] European Commission Better Regulation Guidelines.
[4] The European Green Deal (COM/2019/640 final).
[5] Including in the negotiations on a new global biodiversity framework, to be agreed at the 15th Conference of the Parties to the Convention on Biological Diversity in December 2022.
[6] EU Biodiversity Strategy for 2030: Bringing nature back into our lives (COM/2020/380 final).
[7] At the time the Strategy was implemented, the UK was a member of the EU.

environmental, social and economic impacts of implementation vis-à-vis those forecast in the 2011 impact assessment[8], and considers whether the Strategy has been a suitable instrument to help the EU and its Member States to deliver on the 2020 headline target.

The evaluation covers other EU legal and policy initiatives in several ways:

- **Some biodiversity targets and actions aimed to support the implementation of existing EU legislation**. The Strategy included concrete targets and actions to support, for example, the implementation of the EU Birds and Habitats Directives (Target 1) and the Marine Strategy Framework Directive (Target 4). In such cases, the evaluation aimed to cover the extent to which the Strategy's actions have succeeded in providing the intended support.

  In reality, it was very difficult to distinguish what part of the progress is the result of the legislation itself, or the Strategy. The evaluation attempts to provide at least a qualitative assessment of the likely contribution of the Strategy, and also highlights the views of key actors in this respect.

- Some biodiversity targets and actions aimed to influence other EU policies. The evaluation has considered the extent to which the desired change has taken place, and how it has been implemented (as well as the overall consistency between the policies). Examples include:

– **Target 3**, which sought to increase the contribution of the Common Agricultural Policy to biodiversity in the 2014-20 reform
– **Target 4**, which sought to include concrete targets in the Common Fisheries Policy to achieve Maximum Sustainable Yield and healthy stocks
– **Target 6,** which sought to improve the impact of EU trade agreements on biodiversity.

- **Some biodiversity targets and actions aimed to adopt new policies and legislation**, for example the EU Green Infrastructure Strategy (Target 2) and the EU Regulation on Invasive Alien Species (Target 5). The evaluation of implementation takes account of whether these instruments have been adopted.

Some of the above instruments have been subject to separate evaluations or implementation reviews. Where this has been the case, the results have been taken into account in this report. The assessment of coherence also takes into consideration other policy initiatives that do not directly fall under the Strategy's scope.

[8] Commission Staff Working Paper: Impact Assessment accompanying the EU Biodiversity Strategy to 2020 (SEC/2011/540 final).

2. 2. BACKGROUND TO THE INITIATIVE

1.3. 2.1. Description of the initiative and its objectives

Biodiversity – the variety of life on Earth – and the benefits provided by healthy ecosystems to people, have been in steep decline in recent decades, both in the EU and globally. Recognising the urgent need to halt and reverse this trend, in 2010 EU leaders endorsed a 2050 vision and a 2020 headline target for biodiversity[9].

To deliver the headline target, in 2011 the Commission adopted the EU Biodiversity Strategy to 2020, setting six operational targets supported by 20 time-bound actions. Table 1 below summarises the structure of the Strategy. The full definitions of targets, actions and sub-actions are presented in Annex 5.

Table 1. Structure of the EU Biodiversity Strategy to 2020

2050 vision **By 2050, European Union biodiversity and the ecosystem services it provides - its natural capital - are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided.**
EU 2020 headline biodiversity target **Halt the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restore them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.**
Target 1: Fully implement the EU nature legislation (the Birds and Habitats Directives)
Action 1: Complete the establishment of the Natura 2000 network and ensure good management **Action 2: Ensure adequate financing of Natura 2000 sites** **Action 3: Increase stakeholder awareness and involvement and improve enforcement** **Action 4: Improve and streamline monitoring and reporting**
Target 2: Maintain and restore ecosystems and their services
Action 5: Improve knowledge of ecosystems and their services in the EU **Action 6: Set priorities to restore 15% of degraded ecosystems and promote the use of green infrastructure** **Action 7: Biodiversity-proof EU-funded programmes and measures, and ensure no net loss of biodiversity and ecosystem services**
Target 3: Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity
Action 8: Enhance direct payments for environmental public goods in the EU Common Agricultural Policy **Action 9: Better target rural development to biodiversity conservation** **Action 10: Conserve Europe's agricultural genetic diversity** **Action 11: Encourage forest holders to protect and enhance forest biodiversity** **Action 12: Integrate biodiversity measures in forest management plans**
Target 4: Ensure the sustainable use of fisheries resources
Action 13: Improve the management of fished stocks **Action 14: Eliminate adverse impacts on fish stocks, species, habitats and ecosystems and support**

[9] Biodiversity: Post-2010 EU and global vision and targets - Council Conclusions of 15 March 2010.

the implementation of the Marine Strategy Framework Directive
Target 5: Combat invasive alien species
Action 15: Strengthen the EU plant and animal health regimes **Action 16: Establish a dedicated instrument on invasive alien species**
Target 6: Help avert global biodiversity loss
Action 17: Reduce indirect drivers of biodiversity loss **Action 18: Mobilise additional resources for global biodiversity conservation** **Action 19: Biodiversity-proof EU development cooperation** **Action 20: Regulate access to genetic resources and the fair and equitable sharing of benefits arising from their use**
Horizontal measures:
• **Mobilise resources for biodiversity,** • **Strengthen partnerships with stakeholders in key sectors of business and society,** • **Improve governance with the establishment of a Common Implementation Framework.**

The Strategy brought together existing commitments under EU legislation and policies along with new ones, presenting them as a coherent package. It formed an integral part of the Europe 2020 Strategy for smart, sustainable and inclusive growth[10] and the 7th Environmental Action Programme[11].

It was designed to support the implementation of EU environmental legislation[12] and strengthen synergies with a range of EU policies including on the environment, climate, agriculture, rural development, fisheries, regional development, research, trade and development cooperation.

Furthermore, as parties to the Convention on Biological Diversity (CBD), the EU and its Member States are required to prepare a national biodiversity strategy and action plan (NBSAP) or equivalent instrument, and to ensure that biodiversity is mainstreamed into all sectors whose activities can have an impact on biodiversity.

The EU is – along with all the EU Member States – a full party to the CBD. The Strategy is therefore to be considered as the EU level- NBSAP implementing the EU's global commitments under the CBD and its global Strategic Plan for Biodiversity 2011-20, including the Aichi targets[13].

[10] Europe 2020: a European strategy for smart, sustainable and inclusive growth (COM/2010/2020).
[11] Environmental Action Programme to 2020: Living well, within the limits of our planet (Decision No 1386/2013/EU).
[12] In particular the EU Birds Directive (Directive 2009/147/EC), EU Habitats Directive (Directive 92/43/EEC), EU Water Framework Directive (Directive 2000/60/EC) and the EU Marine Strategy Framework Directive (Directive 2008/56/EC). The EU Regulation on Invasive Alien Species (Regulation (EU) No 1143/2014) was adopted in 2014 in implementation of Target 5.
[13] The Aichi targets are set out in the Global Strategic Plan for Biodiversity 2011-2020. The 15th Conference of the Parties to the CBD is expected to adopt a post-2020 global biodiversity framework in December 2022.

1.4. 2.2. Intervention logic

The problem the Strategy aimed to solve is the loss of biodiversity and ecosystem services, both in the EU and globally.

A target to halt biodiversity loss by 2010 had been set by the EU Heads of State and Government already in 2001, and an EU Biodiversity Action Plan[14] had been in place since 2006 to accelerate progress towards it.

However, despite significant action carried out, the EU missed the 2010 target: the status and condition of biodiversity and ecosystems in the EU, and the essential services they provide continued to deteriorate in 2010, driven by changes in land use, pollution, overexploitation, invasive alien species and climate change[15].

The most significant reasons for failure to tackle these drivers were found to be insufficient integration of biodiversity-related objectives across other sectoral policies, incomplete and uneven implementation of existing legislation and policy gaps, as well as shortcomings in funding for biodiversity in the EU[16].

The impact assessment for the EU Biodiversity Strategy for 2020[17] further identified a range of indirect drivers related to demographic and cultural/lifestyle choices, institutional drivers, market failures, economic structure, size and growth, and trade.

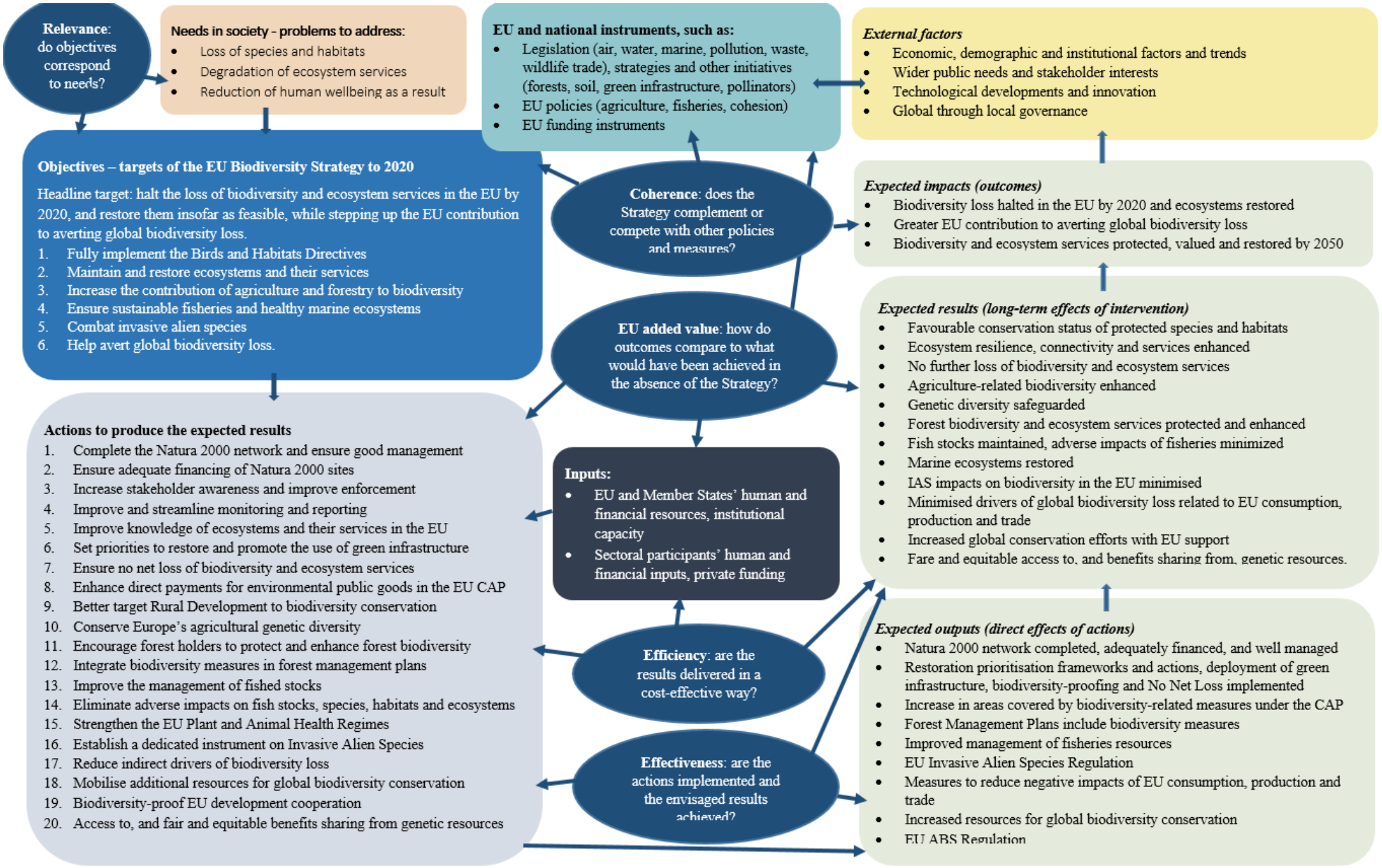
The intervention logic of the EU Biodiversity Strategy to 2020, outlined in the Commission's impact assessment accompanying the Strategy, was based on the analysis of the trends and causes of continuing biodiversity decline in the EU and globally, a business-as-usual scenario until 2020, and the assessment of several policy options for EU action, and their potential impacts.

The intervention logic presents the problem, the objectives (targets) of the Strategy, the action to be taken by the Commission, Member State authorities and other actors to implement it, and the expected results (outputs, outcomes and impacts).

The intervention logic illustrated in **Figure 1** below draws on the 2010 impact assessment underpinning the Strategy, and indicates links to the evaluation criteria.

[14] Halting the loss of biodiversity by 2010 and beyond – sustaining ecosystem services for human wellbeing (COM/2006/216 final).
[15] EEA (2010). EU 2010 biodiversity baseline (European Environment Agency Technical report No 12/2010).
[16] 2010 Assessment of implementing the EU Biodiversity Action Plan (COM/2010/548 final).
[17] Commission Staff Working Paper: Impact Assessment accompanying the EU Biodiversity Strategy to 2020 (SEC/2011/540 final).

Figure 1. Intervention logic of the EU Biodiversity Strategy to 2020 (based on 2010 impact assessment)



1.5. 2.3. Baseline

Due to the complexity and wide range of direct and indirect drivers of biodiversity loss, it was not possible to establish a clear baseline. Two earlier studies were used as a starting point to measure progress to the 2020 biodiversity targets.

In 2010, the European Environment Agency published ***a comprehensive assessment report on the state and trends of biodiversity in 2010*** (called the "2010 EU biodiversity baseline"[18]) using a number of indicators. This assessment provides the starting point to measure and monitor changes in biodiversity status and trends in key drivers of biodiversity loss from 2011 to 2020.

The EEA report revealed that in 2010, only 17% of the assessments of habitats and species protected under the Nature Directives[19] were 'favourable', while 65% of habitats assessments and 52% of species assessments were 'unfavourable' (with the number being as low as just 5% for grasslands). Since 1990, common farmland birds had declined by 20–25%, all common bird populations by around 10% and grassland butterflies by nearly 60%, showing no sign of levelling off.

Corine Land Cover inventories[20] showed continued expansion of artificial surfaces at the expense of grasslands, wetlands and cultivated land. The serious and continuing loss of Europe's biodiversity resulted in a decline in the ability of ecosystems to sustain their natural production capacity and perform regulating functions, such as crop pollination, clean air and water provisioning, and the control of floods or erosion. An increase in provisioning services, such as timber, was also noted. The EEA assessment was subsequently updated in 2015 and 2020.

In 2011, a ***business-as-usual scenario*** was developed as part of the impact assessment underpinning the EU Biodiversity Strategy to 2020[21]. It described how the state of biodiversity, and pressures on it, would likely develop in the absence of an EU Biodiversity Strategy. It made a qualitative projection of the likely level of implementation and consequences of existing policy and legislation.

Overall, the impact assessment suggested that without an EU Biodiversity Strategy to provide the framework for significant additional (i) policy and legislative reforms, (ii) measures to strengthen the implementation of existing legislation and (iii) biodiversity measures, the EU would not attain the 2020 biodiversity headline target.

Ecosystem degradation driven by land-use changes, overexploitation, pollution, habitat loss, climate change and invasion by alien species would likely continue or worsen. It predicted that mean species abundance would continue to decline in Europe, from approximately 40% in 2010 to approximately 37% in 2050.

The support study for this evaluation[22] revisited and introduced minor retrospective changes to the 'business as usual' scenario, reflecting new information and actual developments of EU policies and legislation (insofar as they were not considered to be a result of the Strategy). More detail on the assumptions of the 'business as usual' scenario is provided in Annex 6.

[18] EEA (2010). EU 2010 biodiversity baseline (European Environment Agency Technical report No 12/2010).
[19] EU Birds Directive (Directive 2009/147/EC) and EU Habitats Directive (Directive 92/43/EEC).
[20] https://land.copernicus.eu/pan-european/corine-land-cover
[21] Commission Staff Working Paper: Impact Assessment accompanying the EU Biodiversity Strategy to 2020 (SEC/2011/540 final).
[22] Trinomics B.V. (2021). Support to the evaluation of the EU Biodiversity Strategy to 2020. Final study report.

This scenario was used as a reference point for the purposes of the evaluation support study, while recognising its limitations:

(i) interactions between biodiversity and other EU legislation and policies are complex;

(ii) there are uncertainties about the evolution and impacts of wider indirect drivers (for example those related to lifestyle choices, institutional drivers, market failures, economic growth, or trade), and

(iii) it is difficult to assess whether and how key policies would have developed or would have been implemented in the absence of the Strategy.

The business-as-usual scenario is a useful point of reference for the evaluation, but the limitations outlined above mean that it does not amount to a comprehensive established counterfactual. The evaluation therefore uses progress towards the 2020 biodiversity targets as the most important measure of the Strategy's effectiveness.

3. 3. IMPLEMENTATION AND STATE OF PLAY

Since its adoption in May 2011 and until its target date in 2020, the EU Biodiversity Strategy to 2020 provided the EU framework for action on biodiversity, in a coordinated manner with the Member States and in line with the global Aichi biodiversity targets.

In 2015, the Commission undertook a mid-term review of the implementation of the Strategy[23]. It drew on the monitoring framework with indicators[24] and assessed progress and trends for each target.

It concluded that the EU was not on track to deliver for all but one of its biodiversity targets (Target 5, for which both actions had been implemented according to schedule).

Biodiversity loss and the degradation of ecosystem services had continued in the EU and globally, driven by habitat loss, pollution, over-exploitation, invasive alien species and climate change, with serious implications for the capacity of ecosystems to meet human needs in the future.

The mid-term review considered factors that had impeded implementation, highlighting in particular insufficient financing and mainstreaming of biodiversity objectives into other policies, as well as insufficient integration of the value of biodiversity and ecosystem services in policy and investment decisions.

At the same time, the review pointed to many examples of successful implementation on the ground, which indicated that - with sufficient effort and adequate financing - it is possible to reverse the trend of biodiversity loss.

Efforts were stepped up following the 2015 mid-term review, guided by an EU Roadmap for enhanced implementation[25] that the Commission drew up in 2016, in cooperation with Member State authorities and stakeholders in the Coordination Group for Biodiversity and Nature[26].

This roadmap included measures to step up implementation of existing actions and introduced new actions where needed (e.g. a new EU Pollinators Initiative[27]). It was created and implemented in synergy with the Action plan for nature, people and the economy[28], which aimed to tackle implementation and enforcement weaknesses identified in the fitness check on EU nature legislation[29].

The latest assessments of the state of biodiversity in the EU in 2020 indicate that, despite increased efforts, the targets have not been achieved, as further specified in the next sections: only 15% of habitat assessments under the Habitats Directive show good status (a further deterioration since 2010), and many pressures on ecosystems are stable or increasing, exacerbated by the growing impacts of climate change and invasive alien species.

At the same time, progress made in certain areas show that a persistent implementation effort can be effective. These include pollution reduction, air and water quality, increasing the share of organic farming, the expansion of forests, species assessments under the Habitats Directive showing favourable status or positive trends, and a number of marine fish stocks reaching sustainable levels.

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[23] Mid-term review of the EU Biodiversity Strategy to 2020 (COM/2015/478 final).
[24] As outlined in the EU 2010 baseline revision (European Environment Agency Technical report No 9/2019) and including the Streamlined European Biodiversity Indicators (SEBI 2010) as well as data available from reporting under relevant EU legislation.
[25] EU Roadmap for enhanced implementation of the EU Biodiversity Strategy to 2020 (2016).
[26] The Coordination Group on Biodiversity and Nature was the main Commission Expert Group with Member States and stakeholders coordinating the implementation of the EU Biodiversity Strategy to 2020.
[27] EU Pollinators Initiative (COM/2018/395 final).
[28] Action Plan for nature, people and the economy (COM/2017/198 final).
[29] Fitness check of the EU Nature Directives (SWD/2016/472 final).

The EU-level findings resonate with global assessments. In 2018 the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) published a Regional assessment report on biodiversity and ecosystem services for Europe and Central Asia[30] and, in 2019, a Global assessment of biodiversity and ecosystem services[31].

These comprehensive assessments confirmed the continuing decline of biodiversity and nature's contributions to people, warning that the achievement of the Sustainable Development Goals by 2030 would not be possible unless this trend is reversed. Biodiversity loss was recognised as one of the most critical global environmental threats alongside climate change — and the two are inextricably linked.

1.6. 3.1. State of play on implementation of the EU Biodiversity Strategy to 2020

The Strategy's implementation period finished at the end of 2020. Annex 7 provides an overview of the main outputs delivered under each target and action between 2011 and 2020. When assessing implementation of the targets, progress to each target has been scored using five categories, as follows:

Table 2. Assessment categories for scoring implementation of the EU biodiversity targets

Assessment category	Definition
No progress	The EU and the Member States have not implemented the actions and they have not made progress to the target.
Limited progress	The EU and the Member States have implemented few actions. Progress has been largely insufficient to achieve the target.
Moderate progress	The EU and the Member States have implemented a number of actions. There is moderate progress towards the target.
Significant progress	The EU and the Member State have implemented the majority of the actions. They have gone a long way to achieving the target, but some gaps remain.
Fully implemented	The EU and the Member State have adopted and implemented all actions. This has resulted in the adequate delivery on the target.

Some of the biodiversity targets were not fully SMART[32] (see list of actions in Annex 5), which has implications for measuring and scoring the degree of their delivery.

[30] Regional Assessment Report on Biodiversity and Ecosystem Services for Europe and Central Asia of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2018).
[31] Global Assessment Report on Biodiversity and Ecosystem Services (IPBES, 2019).
[32] Specific, Measurable, Accepted, Realistic, Timely.

Within most targets, implementation progress varied for the actions. A detailed assessment of each individual action has been provided in the final report of the study supporting this evaluation[33].

The overall assessment of progress towards each target is presented in Table 3 below. Scores have been assigned separately on two aspects for each target (except the headline target, which has no actions):

(i) progress in implementing the actions

(ii) progress in delivering on the target (i.e. achieving biodiversity impacts on the ground).

Table 3. Assessment of the implementation of the EU biodiversity targets to 2020

Target	Score and comments
EU 2020 headline biodiversity target: halt and reverse the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and help to avert global biodiversity loss.	**Progress to target: LIMITED** The loss of biodiversity and ecosystem services has continued in the EU and globally. There have been positive examples of pressure reduction, restoration and sustainable management of ecosystems that demonstrate the feasibility of halting and reversing biodiversity loss. However, their scale has been too small to reverse degradation. The main pressures on EU biodiversity have been unsustainable agricultural and forestry activities, urbanisation, species over-exploitation, invasive alien species, hydro-morphological alterations, energy infrastructure, pollution and climate change[34]. In 2020, the potential of EU ecosystems to deliver benefits to people was the same or lower than it was in 2010, while human demand for services continued to increase, resulting in a growing deficit[35]. Globally, biodiversity has been declining faster than at any time in human history, and direct and indirect drivers of change[36] have accelerated during the past decades. Together with climate change, biodiversity loss increases the risk of irreversible changes and undermines economic development and the resilience of societies in the face of new challenges.
Target 1: Fully implement EU Nature Legislation *To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments:* • *100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and* • *50% more species assessments under the Birds Directive show a*	**Progress on implementing the actions: MODERATE to SIGNIFICANT** The majority of the actions under Target 1 were partly or fully implemented. Member States have made good progress in designating **Natura 2000** sites. The terrestrial network is almost complete, and the marine network has increased almost 3-fold since 2010. Actions under the Strategy have supported good practice exchange, enforcement and policy integration, as well as awareness raising on the importance of Natura 2000. Reporting under the Nature Directives has been streamlined and integrated in the State of Nature reports. However, key actions were not fully implemented. Gaps remain especially in the marine Natura 2000 network, the management of Natura 2000 sites, and in ensuring sufficient financing. In 2017-19, following the fitness check on the Nature Directives, the Commission adopted and implemented an Action Plan to tackle a number of the identified gaps and weaknesses[37]. **Progress to target: LIMITED to MODERATE** Despite local improvements following conservation actions, overall only 15% of habitat assessments under the Habitats Directive show good status (down from

[33] Trinomics B.V. (2021) Support to the evaluation of the EU Biodiversity Strategy to 2020. Final study report.
[34] EEA (2020). State of Nature in the EU 2020 (European Environment Agency Report No 10/2020).
[35] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment and Summary for Policy-Makers.
[36] The IPBES Global Assessment identified five main direct drivers of biodiversity loss globally, namely: changes in land and sea use; direct exploitation of organisms; climate change; pollution; and invasion of alien species. Indirect drivers are underpinned by societal values and behaviours, and include production and consumption patterns, human population dynamics and trends, trade, technological innovations and local through global governance.
[37] EU action plan for nature, people and the economy (2017-19) (SWD/2017/139 final).

secure or improved status.	17% in the 2010 biodiversity baseline), and most habitat assessments show poor (45%) or bad (36%) conservation status at EU level[38]. On the positive side, the proportion of species assessments under the Habitats Directive that show favourable status or improving trends has increased from 17% to 27%[39]. However, less than half (47%) of all species assessments under the Birds Directive showed good status in the 2013-18 reporting period, an actual decrease of 5% from the 2008-12 reporting period. The achievement of favourable conservation status has been hindered by management deficiencies such as a lack of adequate conservation objectives and measures for many sites, conflicting land management objectives and funding constraints (funding has increased but remains clearly insufficient). Many Natura 2000 sites continue to suffer from anthropogenic pressures and fragmentation.
Target 2: Maintain and restore ecosystems and their services *By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems*	**Progress in implementing the actions has been uneven, ranging from LIMITED to SIGNIFICANT** The initiative on the Mapping and Assessment of Ecosystem Services (MAES)[40] has developed one of the most advanced regional ecosystem assessment schemes, with the engagement of all Member States. With the publication of the EU ecosystem assessment[41], it has helped to build a significant knowledge base on EU ecosystems and the services they provide. The Commission supported the development of an integrated natural capital accounting system for ecosystems and their services and associated datasets via the Knowledge Innovation Project on ecosystem services and Natural Capital Accounting (KIP INCA)[42]. The EU Green Infrastructure Strategy (2013) has encouraged investment in green infrastructure and mobilised funding from EU instruments. The Commission further provided guidance to Member States on developing Restoration Prioritisation Frameworks to advance towards the 15% restoration target. However, only a few Member States have presented such frameworks and restoration progress has been slow and uneven. A methodological framework was developed for biodiversity-proofing the EU budget[43], however, its use in the national programming of EU funds has remained limited. The Commission has developed guidance on integrating ecosystems and their services[44] into decision-making; however, no initiative was undertaken to enshrine the No Net Loss approach[45] in a dedicated EU policy instrument. **Progress to target: LIMITED** Pressures on ecosystems continue and affect their capacity to deliver essential benefits to people[46]. Studies indicate that restoration activities have taken place in all Member States, but significantly below what would have been required to reach the target of restoring 15% of degraded ecosystems[47].
Target 3a: Increase the contribution of agriculture to maintaining and enhancing biodiversity *By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP, to*	**Progress in implementing the actions: MODERATE** The revised Common Agricultural Policy (CAP) for 2014-20 included strengthened biodiversity provisions for mandatory cross-compliance, greening obligations and a ban on ploughing up environmentally sensitive permanent grasslands, as well as biodiversity support measures under Pillar II (Rural Development). The effectiveness of measures has been influenced by the variety of implementation choices made by the Member States. The available indicators do not point to particular EU level improvements[48].

[38] EEA (2020). State of Nature in the EU 2020 (EEA Report No 10/2020).
[39] Calculated against the 2010 situation, the target of a 50% increase would mean 35% of species assessments showing a secure or improved status by 2020. Note that, for consistency across the reporting under the Birds and Habitats Directives, the term "good" status was used in the State of Nature Report 2020.
[40] Mapping and Assessment of Ecosystem Services (MAES).
[41] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment and Summary for Policy-Makers.
[42] Natural Capital Accounting.
[43] Common Framework and Guidance Documents for Biodiversity proofing of the EU budget.
[44] European Commission (2019). EU Guidance on integrating ecosystems and their services into decision-making (2019). Summary for Policymakers in Government and Industry.
[45] No Net Loss.
[46] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment 2020 and Summary for Policy-Makers.
[47] Eftec et al. (2017) Technical support in relation to the promotion of ecosystem restoration in the context of the EU biodiversity strategy to 2020. Final report.
[48] Evaluation of the impacts of the CAP on biodiversity, soil and water (natural resources) (SWD/2021/424 final).

ensure the conservation of biodiversity and bring about a measurable improvement in (i) the conservation status of species and habitats that depend on or are affected by agriculture and (ii) the provision of ecosystem services, compared to the EU2010 baseline. This will help improve sustainable management.	**Progress to target: LIMITED** Agri-environmental and climate measures have shown some positive local impacts on biodiversity. These impacts have been limited by a relatively low uptake in many Member States. The impact of greening measures at EU-level has also been limited due to insufficient coverage and a preference for low-impact measures. The Target did not explicitly tackle pressures from intensive agricultural practices, nor from land abandonment. Biodiversity continues to decline in agricultural habitats, and to a lesser extent in forests, as shown by a number of biodiversity indicators (e.g. the conservation status of habitats and species targeted by the Nature Directives, and population trends in grassland butterflies and common farmland birds). More than 45% of Annex I assessments of agricultural habitats were assessed as bad in the last reporting period (2013-18)[49]. Over the last few decades, these declines have been primarily due to the effects of two trends: – on the one hand, intensive cultivation techniques on most grasslands and croplands, involving high fertiliser and pesticide use, crop specialisation, increases in field size and losses of non-farmed habitats and landscape features; – on the other hand, substantial agricultural abandonment or conversion of semi-natural habitats, such as semi-natural grasslands[50].
Target 3b: Increase the contribution of forestry to maintaining and enhancing biodiversity *By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM), are in place for all forests that are publicly owned and for forest holdings above a certain size (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that receive funding under EU rural development policy.* *The objective is to bring about a measurable improvement in the conservation status of species and habitats that depend on or are affected by forestry, and in the provision of related ecosystem services, compared to the EU 2010 baseline.*	**Progress in implementing the actions: MODERATE** Forest Management Plans have been used as a tool by forest owners throughout Europe, yet data to assess their effectiveness and the inclusion of biodiversity-relevant measures remain scarce. Significant portions of EU forests are not covered by management plans. Some innovative finance mechanisms such as payments for ecosystem services (PES) have been implemented, mostly at local level. CAP measures to support forest biodiversity have had varying degrees of uptake in the Member States. Investment in improving resilience, including some biodiversity aspects, was included in more than two-thirds of the programmes and represented 20% of total public expenditure planned for forestry measures at EU level. However, payments for voluntary management commitments going beyond legal obligations and for compensation for Natura 2000 related restrictions had a limited uptake. The support measure for managing environment and climate services and forest conservation has been programmed and allocated funding in just 25 rural development programmes in Member States, representing only 4% of the total forestry measures. Budgets and uptake have been far below the scale of implementation required for Member States to meet their legal obligations under the Habitats and Birds Directives[51]. **Progress to target: LIMITED** Assessments reveal that, while 31% of forest habitats assessed have a bad conservation status, 32% of forest bird species show an improving trend, 40% a stable trend and 16% a deteriorating trend[52].
Target 4: Ensure sustainable fisheries and support healthy marine ecosystems *Achieve maximum sustainable yield (MSY) by 2015. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving good environmental*	**Progress in delivering the actions: MODERATE** Under the reformed Common Fisheries Policy, important developments in the conservation and management of marine biological resources have been made in setting Total Allowable Catches (TACs) and quotas, multi-annual plans, landing obligation and discard plans, technical and other conservation measures for commercial fish stocks and fisheries exploiting those stocks. The EU plays an active role in many Regional Fisheries Management Organisations aimed at ensuring the sustainable management of fisheries resources[53]. However, significant challenges remain. Data gaps on the status and trends of marine ecosystems hinder the design of effective measures.

[49] EEA (2020). State of Nature in the EU 2020 (European Environment Agency Report No 10/2020).
[50] Alliance Environnement (2020). Study on the evaluation of the impacts of the CAP on habitats, landscapes, biodiversity. Final Report.
[51] Evaluation concerning the forestry measures under rural development (SWD/2019/389 final).
[52] EEA (2020). State of Nature in the EU 2020 (European Environment Agency Report No 10/2020).
[53] Regional fisheries management organisations (RFMOs).

status by 2020, as required under the Marine Strategy Framework Directive.	**Progress to target: LIMITED** Despite some progress and recovery in a number of fish stocks, others continue to be outside safe biological limits and/or are overfished. In addition to fisheries, further pressures from land and sea use, pollution, invasive alien species and climate change need to be addressed for marine ecosystems to achieve good environmental status.
Target 5: Combat invasive alien species	**Progress in delivering the actions: FULLY IMPLEMENTED** The adoption of the Invasive Alien Species (IAS) Regulation and the strengthening of the EU plant and animal health regimes have been important first steps to combatting IAS in the EU. In October 2021, the Commission published its report on the application of the IAS Regulation[54], primarily based on reports submitted by Member States for 2015-18. Given that the deadlines for implementing the various obligations of the IAS Regulation applied gradually since the adoption of the first list of invasive alien species of Union concern in July 2016 (and subsequent updates), it is premature to draw conclusions on most aspects of the IAS Regulation. **Progress to target: LIMITED** Implementation on the ground is still in its early stages and its full impact is yet to be realised. Invasive alien species remain a persistent and growing threat across EU ecosystems. By 2020, 66 IAS had been prioritised for concerted action at EU level and efforts to control or eradicate them had been initiated by the Member States. Action on the management of pathways has on the other hand been delayed significantly, with most Member States not having adopted the required action plans by 2020. The review of the application of the Regulation in the Member States indicates that despite the very short period of full implementation, restrictions, prevention, early detection, rapid eradication and management of widely spread species deliver benefits. However, the EU list is a priority list to which species can only be added once scientific evidence of impact is available, which means that it cannot include all IAS. In addition, Most Member States have not yet implemented the action plans to address the priority pathways.
Target 6: Help avert global biodiversity loss	**Progress in delivering the actions: LIMITED TO MODERATE** International **financial flows** from the EU and its Member States for global biodiversity have been significant since the Strategy was published. EU initiatives such as BEST have increased the efficiency and access to funding for actions related to biodiversity and sustainable ecosystem management. However, information gaps on (international) biodiversity funding limits the tracking of its effectiveness and efficiency. Limited progress has been made on identifying and eliminating **subsidies that are harmful** for biodiversity[55]. The EU has taken measures to tackle illegal trade, for example as part of the implementation of the FLEGT Action Plan and the EU Action plan against wildlife trafficking[56]. Biodiversity-related provisions have been systematically included in the **Trade and Sustainable Development** (TSD) chapters of EU trade agreements. However, detailed assessment of the biodiversity impacts of trade – and the monitoring and enforcement of these (non-binding) provisions – remain a challenge. There is a clear need to reinforce integrated EU external action for biodiversity and sustainable development, better connect biodiversity targets with the SDGs and ensure coherence with internal EU policy developments.

[54] Commission report on the review of the application of the IAS Regulation (COM/2021/628 final).
[55] Many definitions of environmentally harmful subsidies exist depending on a particular context. For example, one such definition was proposed in the 'Study Supporting the phasing out of environmentally harmful subsidies' (IEEP, 2012), drawing on the definition of a 'subsidy' by the Organisation for Economic Cooperation and Development (OECD): "*a result of a government action that confers an advantage on consumers or producers, in order to supplement their income or lower their costs, but in doing so, discriminates against sound environmental practices"*.
[56] EU Action Plan against Wildlife Trafficking (COM/2016/87 final).

	Progress to target: LIMITED Biodiversity and ecosystem functions and services are deteriorating worldwide[57].
Horizontal measures: Governance	**Progress assessment: MODERATE** A Common Implementation Framework (CIF) structure of Expert Groups was set up in 2012, with the Coordination Group for Biodiversity and Nature (CGBN) at its core, in order to support a coordinated and streamlined implementation of the Strategy. A coherent framework was developed for monitoring, assessing and reporting on progress in implementation. The SEBI indicators set[58] supported the measurement and reporting on progress to the 2020 EU biodiversity targets as well as to the global Convention on Biological Diversity. Progress was assessed in the Commission's report on the Mid-term review of the Strategy[59] in 2015, followed by the Council Conclusions[60] and EP Resolution[61] in response to the mid-term review. In order to step up implementation, the Commission, together with Member States and EU stakeholders at the CGBN, developed in 2016 an EU Roadmap for enhanced implementation of the Strategy. However, the Strategy as an instrument was not sufficient to ensure appropriate political commitment, adequate funding, biodiversity mainstreaming and actions to be taken at each level. The stakeholder consultations showed appreciation of the governance arrangements that had enabled regular information to stakeholders on EU level activities, but also frustration with insufficient engagement of key sector actors in implementation.
Horizontal measures: Partnerships	**Progress assessment: MODERATE** There are many examples of partnership-building activities across targets, with many actions focused on information-sharing and collaboration. The EU B@B platform has facilitated front-running businesses to exchange experience and cooperate on developing tools to assess their impacts and dependencies on biodiversity[62]. Stakeholder platforms have been set up to discuss and develop solutions such as the EU platform on large carnivores[63]. The Natura 2000 Biogeographical Process was launched in 2011 to help Member States and key stakeholders manage Natura 2000 as a coherent network[64]. Nevertheless, just under half of the OPC respondents consider that the Strategy helped to ensure cooperation and learning among Member States (50% 'fully' or 'partially' and 50% 'poorly' or 'not at all') or between the EU and third countries (39% 'fully' or 'partially').
Horizontal measures: Financing	**Progress assessment: MODERATE** Significant action has been taken to integrate biodiversity support measures in EU funding instruments in the 2014-20 budget. Biodiversity support measures under the CAP, or the use of European Territorial Cooperation Programmes have driven green infrastructure policies, as well as the increase in funding for global biodiversity in line with the resource mobilisation commitment by the EU and its Member States. However, lack of funding has continued to be a major impediment to implementation success across targets. The lack of legally binding provisions, and the absence of a dedicated financing instrument have been identified by stakeholders as major challenges for funding mobilisation.

[57] Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019).
[58] Streamlining European Biodiversity Indicators (European Environment Agency 2020).
[59] Mid-term review of the EU Biodiversity Strategy to 2020 (COM/2015/478 final).
[60] Environmental Council Conclusions on the mid-term review of the EU Biodiversity Strategy to 2020
[61] EP Resolution on the mid-term review of the EU Biodiversity Strategy to 2020 (A8-0003/2016).
[62] EU Business @ Biodiversity Platform.
[63] EU Platform on co-existence between people and large carnivores.
[64] Natura 2000 biogeographical process.

4. 4. METHODOLOGY

This evaluation uses the standard policy evaluation criteria and follows a well-defined methodology in accordance with the Better Regulation Guidelines[65]. The evaluation criteria were further operationalised through evaluation questions.

1.7. 4.1. Evaluation questions

This evaluation aims to answer the following evaluation questions:

Effectiveness:

- To what extent have the actions defined under the strategy been implemented at the EU level and in the Member States?
- To what extent is the EU Biodiversity Strategy on track to achieve the six operational biodiversity targets and the headline target by 2020, and to progress towards the 2050 vision?
- To what extent has the strategy been successful in addressing the main drivers of biodiversity loss?
- What have been success factors and have successful approaches been shared and replicated?
- What have been possible gaps or challenges that have hindered progress towards the targets?
- To what extent have stakeholders been actively engaged in the strategy's implementation and how have they been affected?

Efficiency

- To what extent has the strategy been cost-effective?
- What factors could have improved cost-effectiveness by strengthening delivery of the targets while minimising unnecessary costs and avoiding administrative burden?
- How timely and efficient is the process for reporting and monitoring?
- Was the Strategy the most appropriate instrument to achieve the EU biodiversity targets to 2020?
- What significant positive and/or negative long-term and/or short-term socio-economic impacts has the Strategy implementation had?
- What have the main socio-economic impacts been, within the EU and globally, of any identified failure to achieve the EU biodiversity targets?

Coherence

- To what extent has the EU Biodiversity Strategy been coherent with the Europe 2020 Strategy for smart, sustainable and inclusive growth?
- Does the strategy support other EU environmental policy objectives, for example, in relation to clean air and water, the marine environment, the transition to a circular economy, sustainable production and consumption, soil protection, land use and management, waste management, the sustainable use of resources and climate policy? What are the synergies or overlaps?
- To what extent are the biodiversity targets coherent with and mainstreamed into other EU policies, in particular on agriculture, fisheries, regional and urban development,

[65] European Commission Better Regulation Guidelines.

energy, climate change, research and innovation as well as trade and development cooperation?
- To what extent is the strategy aligned with the EU's international commitments under the Convention on Biological Diversity, the Sustainable Development Goals and the United Nations Convention on Climate Change?

Relevance
- To what extent do the objectives and targets of the strategy (still) correspond to the needs of the EU with regard to biodiversity?
- Has the strategy been flexible enough to respond to new or emerging issues?
- How relevant is the strategy for the different stakeholders and to EU citizens in particular?

EU added value
- What is the added value resulting from the EU Biodiversity Strategy compared to what is likely to have been achieved by the Member States in its absence?
- How do Member States' targets and implementation add up or compare to the targets at EU-level?

1.8. 4.2. Process

In line with standard practice for Commission evaluations, after adoption of the Roadmap[66], an evaluation matrix was developed, breaking the above evaluation questions further to allow for their analysis, identifying the success criteria and indicators against which the assessment was performed, and clarifying sources of data and evidence. The evaluation matrix set the framework for the evaluation work.

The Commission used an external contractor to support the evaluation by summarising evidence and analysing the evaluation questions. Answers were provided on the basis of evidence gathered from a wide range of qualitative and quantitative sources including:

- **Review of literature, datasets and indicators:** Numerous literature sources were studied, the majority of which were academic studies, Commission impact assessments, evaluations and fitness checks and reviews of relevant EU policies and legislation; Member States and Commission implementation reports on relevant EU legislation; reports by the European Court of Auditors; publications by the European Environment Agency (EEA), the Commission's Joint Research Centre (JRC), position papers by stakeholders as well as independent studies, policy documents, and projects funded by the EU; as well as national policies, publications and reports, including the EU and Member States' 5th and 6th National Reports to the Convention on Biological Diversity. Key sources of evidence included the European Environment – State and Outlook Report[67]; the State of Nature in the EU[68] (EEA 2020); the EU 6th National Report to the CBD (2020)[69]; the first EU Ecosystem Assessment (JRC 2020)[70] and the Streamlined European Biodiversity Indicators (SEBI)[71].

[66] Roadmap for the evaluation of the EU Biodiversity Strategy to 2020.
[67] EEA (2020). The European environment — state and outlook 2020 (SOER) (European Environment Agency 2020).
[68] EEA (2020). State of Nature in the EU (European Environment Agency Report No 10/2020).
[69] EU 6th National Report to the CBD.
[70] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment and Summary for Policy-Makers (Publications Office of the EU, 2020).
[71] Streamlined European Biodiversity Indicators SEBI.

Box. 1 The Streamlined European Biodiversity Indicators (SEBI)

The set of SEBI indicators was a key source of EU level evidence for the evaluation, building on current monitoring and available data. Each indicator provides a message on an individual aspect of the state of biodiversity, pressures on it and responses to help conserve biodiversity and halt its loss. Together, they provide the big picture and have been used in the mid-term review of the EU Biodiversity Strategy to 2020 and the 6th EU Report to the CBD, among others.

The SEBI indicators included: Abundance and distribution of selected European species (SEBI 001), Species of European interest (SEBI 003), Ecosystem coverage (SEBI 004), Habitats of European coverage (SEBI 005), Livestock genetic diversity (SEBI 006), Nationally designated terrestrial protected areas in Europe (SEBI 007), Natura 2000 sites designated under the Habitats and Birds Directives (SEBI 008), Impact of climate change on bird populations (SEBI 011), Forest: growing stock, increment and fellings (SEBI 017), Forest: deadwood (SEBI 018), Agriculture: nitrogen balance (SEBI 019), Agriculture: area under management practices potentially supporting biodiversity (SEBI 020), Ecological footprint of European countries (SEBI 023), Public awareness of biodiversity in Europe (SEBI 026).

Annex 3 provides an overview of the indicators used to inform the assessment of each evaluation question.

- **Online public consultation** was carried out through an online survey. The questionnaire was available in 23 EU languages on the EU Survey portal for 12 weeks between January and April 2021. The consultation was part of a joint consultation that included three distinct but inter-linked EU topics: i) the evaluation of the EU Biodiversity Strategy to 2020, ii) the implementation review of the Invasive Alien Species Regulation (also relevant to Target 5) and iii) the development of binding EU restoration targets (an initiative that also draws on experience with the implementation of Target 2). The joint survey received a total of 111,842 responses. Annex 2 provides an overview of the responses to the evaluation questionnaire.
- **Targeted consultations** including:
    - Interviews with EU-level organisations: a total of 30 interviews were conducted with representatives of EU-level umbrella organisations selected to represent a wide spectrum of interests across environmental, agriculture, forestry, fisheries, business, research and other domains, as well as to gather perspectives and additional evidence about the implementation of the Strategy.
    - Online survey and interviews with Member States' authorities and key stakeholders in order to gather views and evidence of implementation approaches, successes and failures. These case studies took place in ten selected Member States. As a first step, an online survey was sent out to expert stakeholders. A total of 64 stakeholders provided a response. These were followed by interviews with up to five representatives of key authorities and stakeholder organisations per Member State, in order to explore the respondent's experiences in successes and failures of implementation of specific targets, and the underlying factors.
    - Discussions with Commission Services at the Inter-service group on the evaluation of the EU Biodiversity Strategy to 2020, and online meetings with

individual services where necessary to further discuss specific aspects (see also Annex 1).

Annex 2 provides a synopsis report on the consultation activities carried out for this evaluation. Annex 8 provides a summary of key findings on implementation successes and challenges, derived from consultations in the 10 case study Member States.

1.9. 4.3. Limitations – robustness of findings

Biodiversity knowledge has increased significantly over the past years in the EU, among other reasons because of reporting under environmental legislation, strengthened monitoring, research under Horizon 2020 as well as the mapping and assessment of ecosystems and their services that has advanced in all EU Member States. At the global level, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has provided the first global, peer reviewed assessment of biodiversity and ecosystem services, including of the main direct and indirect drivers of loss, impacts on human wellbeing as well as pathways for transformative change. Advances in the economics of biodiversity and ecosystem services, natural capital accounting and valuation have also been made since the Strategy's publication. Experience gained in the Member States offers insights into implementation successes and challenges, and the factors behind them. Research and innovation projects under Horizon 2020 have contributed to improved knowledge and understanding in many areas such as biodiversity decline (including on indirect drivers of biodiversity loss, for example related to food systems), nature-based solutions, valuing and restoring ecosystem services.

These and further sources, complemented with evidence and views provided by stakeholders, form a good evidence basis for drawing conclusions and lessons learned from the implementation of the individual biodiversity targets.

At the same time, significant evidence and knowledge gaps persist, and they have posed limitations to the evaluation analysis, for example in relation to: (i) the condition and trends of some ecosystems and their services, in particular in the marine environment; (ii) comprehensive cost-benefit data for the entire EU (rather than individual projects) for most targets; (iii) comprehensive EU level information on the national implementation of the biodiversity actions and progress to the targets in the Member States, beyond reporting obligations under existing EU legislation.

While the Strategy itself had a non-binding nature, some of its targets and actions aimed to support the implementation of existing EU legislation. For example, Target 1 was to ensure the implementation of the EU Nature Directives, and success is measured by progress to the achievement of favourable conservation status: an objective already embedded in Nature Legislation. Similarly, an action under Target 4 aimed to support the implementation of the Marine Strategy Framework Directive. In such cases, it has proven very difficult to distinguish what part of progress has been the result of the implementation of the legislation itself, or from the Strategy's actions.

Similarly, some biodiversity targets and actions aimed to influence EU policies in other areas (such as the Common Agricultural Policy, the Common Fisheries Policy, or EU trade policy) rendering clear attribution of impacts to the Strategy challenging (as further discussed in Section 2.1).

This meant that, even when evidence on biodiversity outcomes and impacts was strong, it was often difficult to attribute them with a degree of certainty to the Strategy (rather than

to the impact of other legislation or EU policies). In response, extra efforts were made in discussions with stakeholders to explore the possible impact of the implementation of the Strategy in the case study countries.

Overall, efforts to triangulate multiple sources of evidence and the views of interviewed authorities and stakeholders are considered to lead to robust findings in terms of evidence. Where such triangulation was not possible, the evaluation analysis refers to the nature of the evidence used and flags uncertainties, for example related to inconclusive data, unclear causality or when statements reflect the views expressed by stakeholder groups representing a specific interest.

Part of the Strategy's actions concern implementation at the Member State level, while others were for the Commission to implement, in consultation or in cooperation with the Member States. More robust data on operational implementation at the Member States' level is available for those actions that are linked to legislative instruments and include reporting obligations, for example on the designation of Natura 2000 sites or on the conservation status of protected habitats and species. There are gaps in EU level data on the national implementation of voluntary actions where there has been no reporting obligation or mechanism, such as on restoration or the deployment of Green Infrastructure. Some data has been reported by individual Member States or collected with the help of studies. There is also evidence of implementation activities provided during the public consultations, LIFE projects implementation, as well as implementation success stories (as well as challenges) identified by the support study by means of a survey of national implementation of selected targets in ten Member States.

An overview of the main outputs at the EU level is provided in Annex 7. While there is no comprehensive overview of implementation at the national level, Annex 8 provides a wealth of examples and stakeholder views, based on targeted surveys in 10 Member States.

5. 5. ANSWERS TO THE EVALUATION QUESTIONS

1.10. 5.1. Effectiveness

5.1.1 Progress to the targets

Evaluation question 1: *To what extent has the Strategy worked as expected?*

This question covers the following interlinked questions of the evaluation Roadmap:

To what extent:

- *have the actions defined under the Strategy been implemented at the EU level and in the Member States?*
- *is the Strategy on track to achieve the six operational biodiversity targets and the headline target by 2020, and to progress towards the 2050 vision?*
- *has the strategy been successful in addressing the main drivers of biodiversity loss?*

Overall response: None of the six targets of the Strategy have been fully achieved, despite numerous actions being undertaken. Progress towards the headline target has been limited, as illustrated by data on the status of EU habitats and species (see details under Target 1 below), on the condition of EU ecosystems and their services (see details under Target 2 below) and on global biodiversity and ecosystem services (as evidenced in the IPBES global assessment of ecosystems and their services). The main drivers of biodiversity loss continue in the EU and globally.

This insufficient progress is partly due to insufficient implementation of the actions, and partly due to the scope and formulation of the actions that were not always sufficient to deliver some of the targets. The limitations of the Strategy as an instrument to ensure implementation are further discussed in section 2.2. At the same time, significant local efforts and successes need to be acknowledged, even if their scale has been too small to achieve the targets across the EU.

What is the issue?

The delivery of the 20 actions was envisaged to result in the achievement of the six operational targets set out in the Strategy, which, in turn, should have enabled the EU to deliver on its headline target to halt and reverse the loss of biodiversity by 2020, and to help avert global biodiversity loss.

What are the findings?

Progress towards the headline target has been limited. Biodiversity loss and the degradation of ecosystem services in the EU have continued since 2010, and a number of direct and indirect drivers of loss have accelerated, including the increasing impacts of climate change and invasive alien species[72,73]. Ecosystems' potential to deliver a range of services in the EU is stable or decreasing, while demand for these services is increasing, resulting in a deficit of services and further pressures on ecosystems[74]. Globally, biodiversity has been declining faster than at any time in human history, and direct and

[72] EEA (2020). The European environment — state and outlook 2020 (SOER) (European Environment Agency 2020).
[73] EEA (2020). State of Nature in the EU (European Environment Agency Report No 10/2020).
[74] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment and Summary for Policy-Makers (Publications Office of the EU, 2020).

indirect drivers of change[75] have accelerated during the past decades. Together with climate change, biodiversity loss increases the risk of irreversible changes and undermines economic development and the resilience of societies in the face of new challenges.

This overall insufficient progress should not conceal **significant local achievements**. Evidence of conservation efforts and many success examples are highlighted in the analysis of individual targets below, as well as in Annex 8. However, major drivers of biodiversity loss have remained in place, and the scale of individual actions has not been sufficient to counteract these drivers, and to achieve the targets across the EU.

As reported in more detail below, **limited progress has been made to most of the operational (thematic) targets of the Strategy**, despite numerous actions undertaken. It is important to note that the level of implementation of the actions within each target has varied significantly. Of the twenty actions, several are considered completed, such as actions 4 and 16, whereas other actions have shown limited progress. Given the biodiversity status and trends, these targets and actions have not collectively led to the halting of biodiversity loss.

In some cases, insufficient progress to the thematic targets – and therefore to the headline target - can be tracked down to failures to fully implement some of the actions. For example, gaps in the designation of the marine Natura 2000 network, in the adoption of management objectives for Natura 2000 sites and in the enforcement of protection regimes have negatively affected progress to Target 1. Few Member States have developed green infrastructure strategies and frameworks to set restoration priorities under Target 2. Forest management plans did not systematically integrate comprehensive biodiversity measures in line with Target 3B. The EU and the Member States did not undertake sufficient steps to consumption patterns driving global biodiversity loss, as set out under Target 6. Underlying causes of non-implementation have been highlighted in the analysis of each target below.

In other cases, the actions set in the Strategy have been undertaken but this has not been sufficient to achieve the thematic targets, indicating weaknesses in the scope and formulation of some of the targets and of the corresponding actions. For example, Target 2 aimed to restore 15% or ecosystems in the EU, however the actions stopped short of prescribing the necessary implementation efforts, and focussed on the adoption of EU strategies and national prioritisation frameworks instead. In addition, the Strategy did not provide an instrument to oblige actors in the Member States to implement restoration activities. Restoration on the ground was insufficient even in those few Member States that did develop such frameworks. Actions under Target 3A were formulated in a generic way leaving room for interpretation of the level of enhancement needed, and for Member States' choices to set their level of uptake. The actions under Target 5 were implemented, yet the EU has not made sufficient progress in combatting invasive alien species, at least partly because setting up the EU legal framework, its transposition in the Member States and commencing implementation required significant time before implementation could start on the ground. Further reflections on the Strategy as an instrument are provided under section 5.2. They have informed the design of the biodiversity targets and actions to 2030, as well as work on the development of binding EU nature restoration targets.

[75] Direct drivers of loss are: changes in land and sea use; direct exploitation of organisms; climate change; pollution; and invasion of alien species. Indirect drivers include wider factors such as production and consumption patterns, human population dynamics and trends, trade, technological innovations and local through global governance.

Stakeholder views on implementation

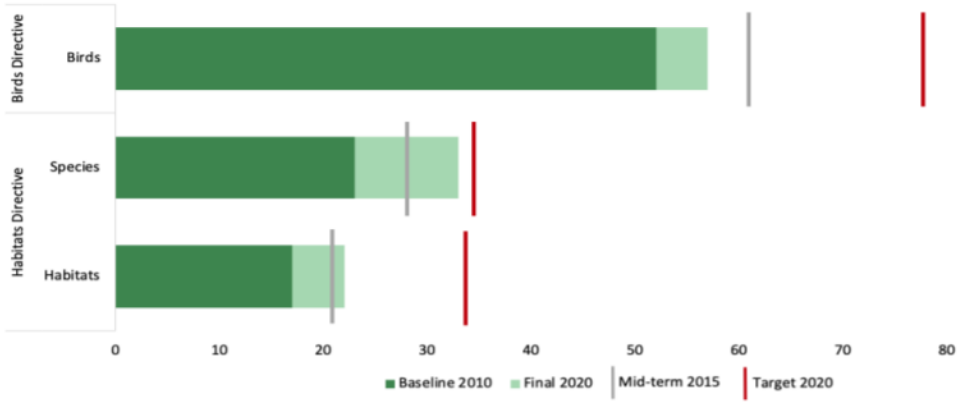
About half or the respondents to the Open Public Consultation considered that the EU had "partially" achieved the headline biodiversity target (48%). Stakeholders who considered that the headline target had been 'fully' achieved largely belonged to the forestry sector (53%, with all but one being respondents from the Polish forestry sector), whereas those who responded 'poorly' belonged mostly to environment (23%), forestry (20%) and culture (19%) organisations. Performance was best-rated under Targets 1 and 3, with 30% of respondents saying that Target 1 was fully achieved, and 22% of respondents considering that Target 3 was fully achieved (again, predominantly answers from forestry sector stakeholders).

Progress to Target 1. Fully implement the Birds and Habitats Directives

To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments:
(i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and,
(ii) 50% more species assessments under the Birds Directive show a secure or improved status.

Progress to Target 1 has been uneven, with a broad set of actions implemented fully or partly, and some significant results visible on the ground. However, as illustrated in Figure 2 below, Target 1 was not achieved. The Strategy aimed to increase by 50% the number of species assessments that show a secure or better conservation status, and by 100% the number of habitats assessments showing a secure or better conservation status.

Figure 2 Progress towards Target 1 as percentage of assessments carried out:



***Note**: Each bar shows the percentage of assessments showing good status or improving. "Baseline" (dark green) is the percentage of assessments with good status or improving in 2010. "Final 2020" is the situation in 2020, based on the latest reporting period under the Nature Directives (2013-18). The grey lines represent the expected mid-term progress (by 2015), and the red lines mark the 2020 target.*
***Source**: State of nature in the EU 2020 (COM/2020/635 final).*

The State of Nature in the EU Report 2020[76] (based on the results of the Member States Reporting under the Nature Directives for 2013-18) reveals that an estimated 47% of European wild bird species assessments show good population status: a decrease of 5%

[76] Commission Report on the State of Nature in the EU 2020 (COM/2020/635 final).

since the last reporting period (2007-12), and 30% of breeding populations exhibit short-term decreasing trends. For species, there was only a 2% gap to the 50% target increase. The majority of habitat assessments show a 'poor' (45%) or 'bad' (36%) status, with only 15% of habitat types assessments showing 'good' status (a 2% decrease since 2010). For habitats not in good status, only 9% of assessments show improving trends between reporting periods, 34% are stable, and 36% are continuing to deteriorate[77]. Some positive trends are noted: an average, 6% of national or regional assessments for habitats and species (other than birds) show improvement. The status of emblematic species has improved thanks to conservation actions, often with support from the EU LIFE Programme (e.g. the recovery of populations of Lynx pardinus and the Cantabrian brown bear in Spain; the brown bear and the wolf in Italy; the chamois and griffon vultures in Bulgaria, the common crane, white-tailed eagle and osprey in the Netherlands)[78]. However, the majority of species within the scope of the Habitats Directive remain in 'poor' or 'bad' status (63% of assessments), with a slightly increasing short-term trend for those in 'good' status (27% of assessments in 2013-18 against 23% in 2007-12 and 17% in 2010). Another remaining challenge is protection outside Natura 2000 sites. Monitoring has improved, however gaps remain in data on status and trends, particularly pertinent for marine species and habitats. The trends of 21% of habitats and 31% of species are unknown[79].

The Member States have progressed significantly with the designation of the Natura 2000 network. The terrestrial network is almost complete and covered about 18% of the EU's land area by 2020. With this extent, the EU has achieved Aichi biodiversity target 11[80]. The marine network has increased significantly, from about 3% of the EU's sea area in 2010 to more than 9% in 2020 for EU-27+UK (and about 8% for EU-27).

However, many Natura 2000 sites continue to suffer from anthropogenic pressures and fragmentation. The most commonly reported pressures on habitats and species are grouped as activities relating to agriculture, urbanization and forestry. For surface water habitats, the predominant factors for not achieving good ecological status under the Water Framework Directive (WFD) include hydromorphological pressures, diffuse pollution and over-abstraction[81].

Management deficiencies, such as delays in the setting of adequate conservation objectives and measures for Natura 2000 sites, as well as constraints related to funding, knowledge, stakeholder engagement, policy integration and human resources have hindered the achievement of favourable conservation status[82]. A special report of the European Court of Auditors concluded that more efforts are needed in the management, financing and monitoring of Natura 2000 network to achieve its full potential[83].

In evaluating progress to Target 1, it is important to note that it aims to support the full implementation of existing legislation. The actions set out in the Strategy aimed to increase stakeholder engagement, strengthen links with other policy areas, raise awareness and provide guidance on different implementation aspects. These actions as well as the Action Plan for nature, people and the economy have supported

[77] EEA (2020). State of Nature in the EU (European Environment Agency Report No 10/2020).
[78] See Annex 8.
[79] Commission Report on the State of Nature in the EU 2020 (COM/2020/635 final).
[80] Aichi biodiversity target 11 of the Convention on Biological Diversity's strategic plan 2011-2020 requires the conservation of at least 17% of terrestrial and inland water and 10% of coastal and marine areas.
[81] Fitness check of the EU Water Legislation (SWD/2019/439 final).
[82] Fitness check of the EU Nature Directives (SWD/2016/472 final).
[83] ECA (2017). More efforts needed to implement the Natura 2000 network to its full potential (European Court of Auditors Special Report No 1/2017)

implementation, good practice exchange, enforcement and policy integration, as well as awareness raising[84] on the importance and benefits from Natura 2000. Partnerships and networks have been developed to share information and experiences among actors, manage and enhance Natura 2000 as an ecological network, as set out in Action 3 of the Strategy. However, it is a challenge to separate with a high degree of certainty the impacts of the actions undertaken as part of the Strategy's Target 1, on the one hand, from other implementation and enforcement actions that would have taken place under the Nature Directives in the absence of the Strategy, on the other.

Progress to Target 2. Maintain and restore ecosystems and their services

By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems.

Limited progress has been made to Target 2, and implementation of the related actions has been uneven.

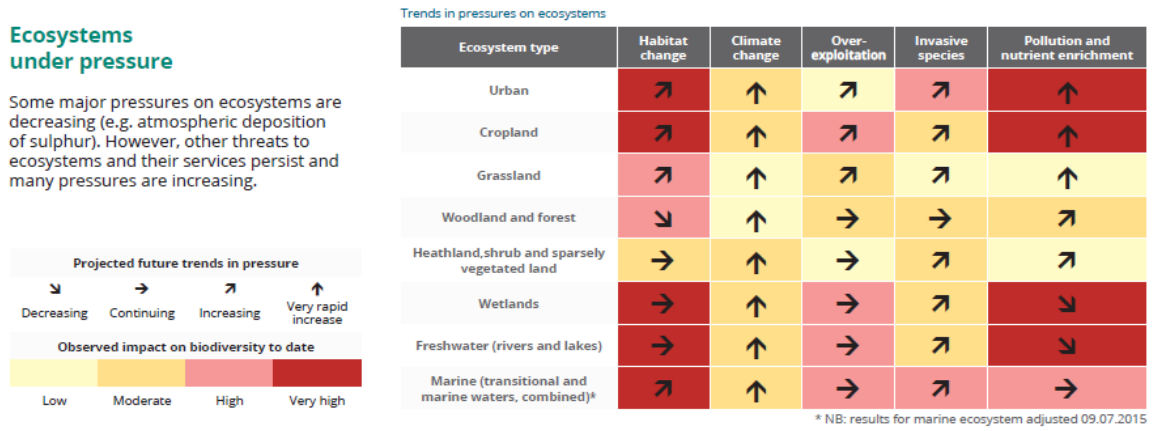
As part of Action 5, the EU initiative on the mapping and assessment of ecosystems and their services (MAES) developed one of the most advanced regional ecosystem assessment schemes, with the engagement of all EU Member States[85]. It has helped to build a significant knowledge base on EU ecosystems and the services they provide, with the publication in 2020 of the first EU ecosystem assessment[86]. Nevertheless, there are still significant gaps in knowledge on biodiversity and ecosystems, underlining the need for a robust biodiversity observation network and more consistent ecosystem condition reporting.

The Commission supported the development of an integrated natural capital accounting system for ecosystems and their services and associated datasets via the Knowledge Innovation Project on ecosystem services and Natural Capital Accounting[87]. Biophysical and monetary assessments of ecosystem services have stimulated projects aiming to improve the conservation status of ecosystems and the development of national natural capital accounts[88].

The EU ecosystem assessment revealed that the main ***pressures on ecosystems*** are broadly similar to those for species and habitats, and exhibit different trends. Atmospheric emissions of air pollutants and critical loads of Nitrogen and Sulphur are decreasing, but their absolute values remain too high. The impacts of climate change on ecosystems are increasing. Invasive alien species of Union concern are observed across all ecosystem types, but their impact is particularly high in urban ecosystems and in grasslands. The combination of pressures on ecosystems from human activities, and their interactions with climate change and the spread of invasive alien species, are posing serious threats. Pressures from overfishing activities and marine pollution are still high.

[84] Eurobarometer survey: Attitudes of European citizens on the issue of Biodiversity (European Commission, 2019) and earlier surveys (2015, 2013 and 2010).
[85] Mapping and assessment of ecosystems and their services (MAES).
[86] An EU ecosystem assessment (JRC, 2020).
[87] Natural Capital Accounting.
[88] See Annex 8 Section 2.2.

Figure 3. Impacts and trends of pressures on the main ecosystem types in the EU.



The EU ecosystem assessment further indicated that societal demand for several ecosystem services that were assessed has continued to increase since 2010, while the potential of ecosystems to provide these services has declined within the same period, resulting in a deficit[89] and increasing the risk of increased pressures and further ecosystem deterioration.

As part of Action 6, and in order to support the restoration of degraded ecosystems, in 2014, the Commission provided guidance to the Member States on the development of **Restoration Prioritisation Frameworks**[90]. Very few Member States formally submitted such frameworks[91]. Data on **ecosystem restoration efforts** in the EU is incomplete. Restoration activity is taking place – often in response to relevant EU legislation, such as the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD). Wetlands and freshwater ecosystems have often been declared as restoration priorities. Restoration projects with support from the EU LIFE Programme have been instrumental for many local and regional conservation successes. They have also demonstrated the added value and effectiveness of transnational conservation approaches, particularly in relation to restoring fish migration routes and coherent site networks for migratory birds[92]. Annex 8 to this report provides a wealth of further examples of restoration initiatives identified in the national implementation surveys.

There is no comprehensive overview of restoration undertaken in the Member States. Estimates in studies suggest that restoration activity has been significantly below what would have been required to reach the target of restoring 15% of degraded ecosystems: between 2,850 km^2 and 5,700 km^2 of habitat restoration is occurring annually in the EU, whereas the restoration needs of Annex I habitats alone (i.e. assessments reported in 'not good' condition) are estimated to concern an area of between 167,000 km^2 to 263,000 km[93].

As part of the implementation of Action 6, the EU published a Strategy on **Green Infrastructure in 2013**[94]**.** Few national green infrastructure strategies have been

[89] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment and Summary for Policy-Makers (Publications Office of the EU, 2020).
[90] European Commission (2014). Guidance to the Member States in relation to the development and application of a strategic Restoration Prioritisation Framework.
[91] Germany, the Netherlands and the region of Flanders (BE).
[92] EASME (2020). Bringing nature back through LIFE. Executive Agency for Small and Medium-sized Enterprises.
[93] Eftec et al. (2017) Technical support in relation to the promotion of ecosystem restoration in the context of the EU biodiversity strategy to 2020. Final report.
[94] EU Green Infrastructure Strategy (COM/2013/249 final).

developed in response to the EU Green Infrastructure Strategy. However, significant development of Green Infrastructure is taking place in some Member States (Germany), and objectives or requirements related to green infrastructure are included in broader biodiversity and nature conservation policies and legislation. There is also evidence of implementation of local, national and transnational green infrastructure initiatives, if often only at a small-scale[95].

Progress to Target 3. Increase the contribution of agriculture and forestry to maintain and enhance biodiversity

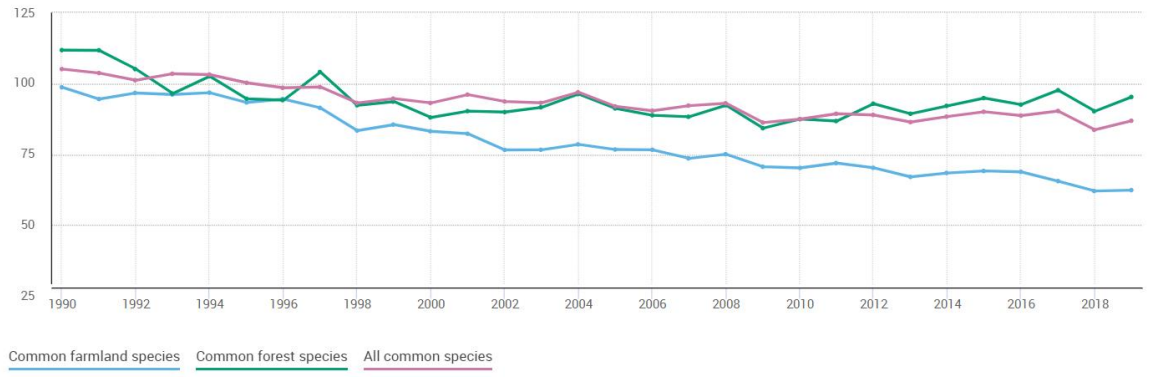
> *By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement(*) in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 Baseline, thus contributing to enhance sustainable management. (*) Improvement is to be measured against the quantified enhancement targets for the conservation status of species and habitats of EU interest in Target 1 and the restoration of degraded ecosystems under target 2.*

Progress towards Target 3A has been limited. The available CAP Common Monitoring and Evaluation Framework (CMEF) indicators do not point to particular EU level improvements[96].

Habitats and species related to agroecosystems, including populations of farmland birds and grassland butterflies, have continued to decline since 2010. These reductions are on top of earlier decreases.

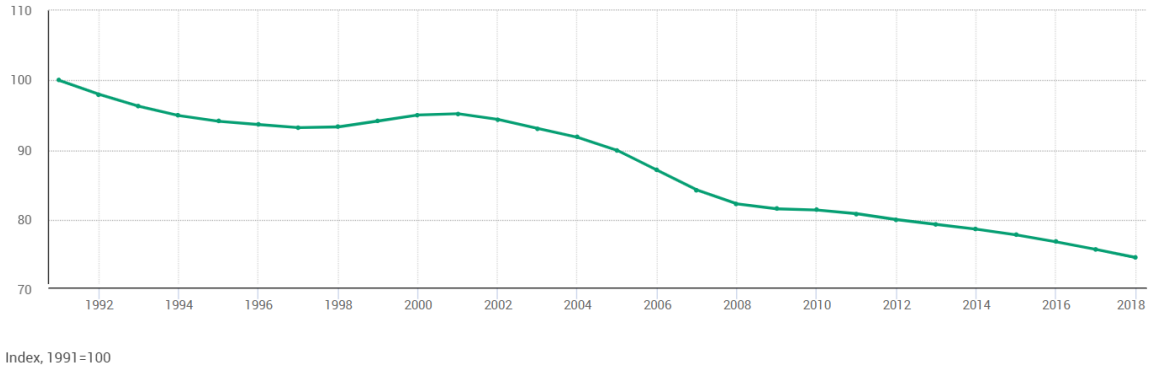
The common birds index shows a certain levelling of the rate of decline of common birds in more recent years. The EU's population of all common bird species is estimated to have declined by 4% but it is showing signs of recovery in recent years. This is particularly the case for common forest birds whose population is estimated to have increased by 9% between 2000 and 2019, whereas the population of common farmland birds is in decline (-17% since 2000).

Figure 4 Common bird index (EU aggregate). Source: Eurostat (2022)[97]



[95] Review of progress on implementation of the EU Green Infrastructure Strategy (COM/2019/236 final).
[96] Evaluation of the impacts of the CAP on biodiversity, soil and water (natural resources) (SWD/2021/424 final).
[97] https://ec.europa.eu/eurostat/databrowser/view/t2020_rn130/default/table?lang=en

Figure 5 Grassland butterfly index (EU aggregate) . Source: EEA, BCE, Eurostat (2021)[98]



Evidence provided in the targeted consultations as well as individual studies in the Member States indicate significant declines in butterfly and farmland bird populations, loss of high nature value farmland as well as exceeded nitrogen loads in over half the area of sensitive ecosystems[99].

The Commission's report on the evaluation of the impacts of the CAP on biodiversity concluded that the extent of uptake and the biodiversity impact of CAP measures, in interaction with other biodiversity-related instruments, are highly dependent on Member States' implementation choices and the priority given to measures to support biodiversity in agroecosystems, or to counteract negative impacts on biodiversity from agriculture.In conclusion, the Common Agricultural Policy has provided options for enhanced biodiversity support measures, in line with the action set out in the Strategy. Their uptake has depended on the choices made by the Member States and regions, and has been overall too low to achieve the quantified target 3A. For example, many Member States have settled for minimum standards under CAP Pillar I. Some of the most beneficial measures for biodiversity under Pillar II, such as Natura 2000 support, have been infrequently used[100]. A special report of the European Court of Auditors concluded that the CAP support had not halted the decline of biodiversity on farmland, despite some instruments having the potential to achieve positive biodiversity outcomes[101]. The Commission's proposals for the future CAP[102] took stock of the strengths and weaknesses of the CAP instruments and included an enhanced conditionality, advisory services, eco-schemes in Pillar I and Pillar II measures.

Following the mid-term review of the Strategy in 2015, as part of its efforts to step up implementation and address identified gaps, the Commission published in 2018 a new EU Pollinators Initiative[103]. The aim was to provide a coherent EU framework for actions to tackle the decline of wild pollinators. In 2021, the Commission published a report on the review of the initiative's implementation[104]. It showed good progress in the

[98] https://ec.europa.eu/eurostat/databrowser/view/sdg_15_61/default/line?lang=en
[99] Umweltbundesamt (2018) Überschreitung der Belastungsgrenzen für Eutrophierung.
[100] Evaluation of the impacts of the CAP on biodiversity, soil and water (natural resources) (SWD/2021/424 final).
[101] ECA (2020). Biodiversity on farmland: CAP contribution has not halted the decline (European Court of Auditors Special Report No 13/2020).
[102] Proposal for a Regulation establishing rules on support for CAP strategic plans to be drawn up by Member States under CAP and financed by the EAGF and by the EAFRD (COM/2018/392 final).
[103] EU Pollinators Initiative (COM/2018/395 final)
[104] Progress in the implementation of the EU Pollinators Initiative (COM/2021/261 final).

implementation of the actions, but also major challenges in tackling the drivers of pollinator decline, particularly habitat loss in farming landscapes and pesticides, as well as the growing importance of drivers such as climate change and environmental pollutants. The Commission will revise the Pollinators Initiative in the second half of 2022, in order to strengthen EU action to resolve the identified challenges.

Target 3B Sustainable forestry

*By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM), are in place for all forests that are publicly owned and for forest holdings above a certain size** (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that receive funding under the EU Rural Development Policy so as to bring about a measurable improvement(*) in the conservation status of species and habitats that depend on or are affected by forestry and in the provision of related ecosystem services as compared to the EU 2010 Baseline.*

(*) Improvement is to be measured against the quantified enhancement targets for the conservation status of species and habitats of EU interest in Target 1 and the restoration of degraded ecosystems under target 2.

(**) For smaller forest holdings, Member States may provide additional incentives to encourage the adoption of Management Plans or equivalent instruments that are in line with SFM.

Progress towards Target 3B has been limited. It is estimated that by 2020, 75% of Europe's forests were covered by a management plan, while 25 out of the 30 countries reporting to Forest Europe have issued a national report on sustainable forest management (SFM)[105]. The degree to which such SFMs include biodiversity measures with beneficial impacts is unknown at the EU level, with the most recent study indicating that biodiversity measures included in such plans are often deemed 'unsatisfactory' in relation to protecting forests and biodiversity from negative effects[106].

Tree species diversity and forest area have been steadily increasing in the EU, while common forest bird species remain in stable conditions overall. Deadwood volumes are increasing but remain below desirable threshold levels for biodiversity. A significant majority of Annex 1 forest habitat assessments show 'bad' or 'poor' status in the EU (85%)[107]. The area indicator shows that bad or poor condition is reported in 21.1% of the Annex 1 forest habitats' area[108], good condition is reported in nearly half of the area (49.5%), and in almost one-third of the area (29.4%), the condition is unknown[109].

Defoliation rates show increasing trends, indicating poor tree health, which corresponds to an increase in various pressures on forest ecosystems[110]. Since 2010, the following pressure indicators have shown a significant upward trend: tree cover loss; water scarcity; warming and extreme droughts (and subsequent impacts on forest productivity). A number of pathways such as conversion of natural forests to plantations, intensification of forest management or harvesting of stumps and roots are a major challenge which can

[105] Forest Europe (2020). State of Europe's Forests 2020.
[106] European Committee of the Regions (2018) Sustainable Forest Management in the Regions.
[107] Commission Report on the State of Nature in the EU 2020 (COM/2020/635 final).
[108] https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-17-national-summary-dashboards/condition-of-habitat
[109] Where 'unknown' can mean both 'no information' or 'information is available, but no capacity to decide if condition is good'.
[110] European Commission (2020). Mapping and assessment of ecosystems and their services: an EU Ecosystem Assessment and Summary for Policy-Makers (Publications Office of the EU, 2020).

exacerbate forest pressures and biodiversity impacts, including when woody biomass is used as a source of renewable energy[111]. On the other hand, biodiversity-friendly practices such as afforestation and reforestation measures that respect ecological principles favourable to biodiversity, agroforestry and other forms of mixed farming can have a positive biodiversity impact.

The EU Forest Strategy (2013) aimed to ensure that all EU forests are managed according to sustainable forest management (SFM) principles by 2020, with objective, ambitious and demonstrable SFM criteria to be developed in cooperation with Member States and stakeholders. A 2018 progress report concluded that the Strategy had made significant progress towards its 2020 objectives, but that implementing the EU biodiversity objectives has remained a major challenge[112]. The 2019 implementation progress assessment noted the lack of an overview of the status of forest management plans throughout Europe, as well as the lack of an analysis of the extent of biodiversity measures included in such plans[113].

An analysis of the implementation challenges of Natura 2000 in forests concluded that the designation of protected areas in forests has met substantial policy challenges and management conflicts with sector stakeholders, and there is still a significant need to strengthen incentive-based conservation instruments for forest management for biodiversity, including compensation payments in Natura 2000[114]. The new EU Forest Strategy for 2030 took account of these findings and set out strengthened measures to protect and enhance forest ecosystems[115].

CAP forestry measures are a key instrument to encourage mainstreaming of SFM in forest planning (being a funding prerequisite for forests above a certain size). However, an evaluation of the CAP forestry measures concluded that it was difficult to assess the support provided by the forest measures to forest management plans[116], due to the differences between Member States in their approach to such plans and the lack of information on implementation. Evidence is scarce on the biodiversity impacts of the CAP forest measures and the afforestation and agroforestry elements of the ecological focus areas in forest areas. These measures are infrequently used by Member States. EFA measures are only targeted at very few high biodiversity areas. Their likely impact may be locally significant but overall limited[117].

The 2012 Prioritised Action Frameworks (PAF) of the Member States did not generally specify forest conservation measures beyond Natura 2000, which could inform CAP funding scheme requirements. Both a comparison of the 2014 PAFs and Rural Development Programmes (RDPs), and the evaluation of the CAP forest measures concluded that CAP forest measures are not widely used to improve forest biodiversity or are not clearly linked to the conservation of the habitat types and species of Community interest identified in the PAFs.

Most of the Member States have programmed investments improving the resilience and environmental value of forest ecosystems, including some biodiversity support measures. Interviewed forest sector stakeholders have noted little evidence of payments for

[111] European Commission (2021) The use of woody biomass for energy purposes in the EU. (Joint Research Centre Science for Policy Report).
[112] Progress in the implementation of the EU Forest Strategy (COM/2018/811 final).
[113] EFI et al. (2019) Study on progress in implementing the EU Forest Strategy. Final Report.
[114] EFI et al. (2017) Natura 2000 and forests: Assessing the state of implementation and effectiveness. Final Report
[115] New EU Forest Strategy for 2030 (COM/2021/572 final).
[116] Alliance Environnement and EFI (2017). Evaluation study of the forestry measures under Rural Development. Final Report.
[117] Evaluation of the impacts of the CAP on biodiversity, soil and water (natural resources) (SWD/2021/424 final).

ecosystem services or other innovative mechanisms deployed at any significant scale (input from forest stakeholders from the targeted consultations in the Member States).

Target 4 Ensure the sustainable use of fisheries resources

Achieve Maximum Sustainable Yield (MSY) by 2015[118]. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020, as required under the Marine Strategy Framework Directive.

Target 4 has shown limited progress overall, however significant progress has been made in relation to fisheries in the Northeast Atlantic where 41% of assessed shellfish and commercial fish stocks have been brought within safe biological limits. The number of Total Allowable Catch (TAC) quotas set in line with the MSY has significantly increased in recent times, from 5 TACs in 2009 to 62 in 2020[119]. Multiannual Management Plans include fisheries measures for the conservation of certain species. Reference to the legal basis under the CFP allows the Member States to adopt measures for the conservation of habitats and species through regionalisation[120]. Ambitious actions and emergency measures have shown success, e.g. in the recovery of the Northern hake and the Northern seabass.

The latest data indicate a reduction in the overall exploitation rate and an increase in the biomass of stocks in the NE Atlantic in the period 2013-20. Nevertheless, many stocks remain overfished and/or outside safe biological limits. The objective of the CFP to ensure that all stocks are fished at or below F_{MSY} in 2020 has not been achieved, due in particular to continued overfishing in the Mediterranean and the Black Sea[121,122], where annual fishing mortality estimates are around twice F_{MSY} for the entire time series (2013-2019)[123].

The 2017 recast Data Collection Framework[124] and the multiannual programme for the collection, management and use of data added a requirement on data to assess the impacts of EU fisheries on marine ecosystems in the EU and in non-EU waters (e.g. incidental bycatch of all birds, mammals and reptiles and fish protected under Union legislation and international agreements). Member States implemented pilot studies to test different methodologies, and this has become part of regular sampling programmes since 2022. This information feeds into the assessments and reporting under the Marine Strategy Framework Directive (MSFD).

The European Maritime and Fisheries Fund has supported investments in on-board equipment that limits or eliminates the physical and biological impacts of fishing on the ecosystem or the sea bed as well as catches of protected mammals and birds, eliminates discards and deals with unwanted catches to be landed. The new EU Technical Measures Regulation[125] completed the framework for conservation measures outside Natura 2000

[118] This target date was postponed to 2020 in the reformed Common Fisheries Policy Regulation No 1380/2013 adopted in 2013.
[119] STECF, (2020) Monitoring the performance of the Common Fisheries Policy (STECF-Adhoc-20-01), Scientific, Technical and Economic Committee for Fisheries (STECF).
[120] Study on regionalisation of Common Fisheries Policy (CFP).
[121] EEA (2019) Marine messages II (European Environment Agency Report No 17/2019).
[122] Review of the status of the marine environment in the European Union. Towards clean, healthy and productive oceans and seas - part 2 (SWD/2020/61 final).
[123] STECF reports on the monitoring of the performance of the Common Fisheries Policy (Scientific, Technical and Economic Committee for Fisheries).
[124] EU Regulation (EU) 2017/1004 and Commission Implementing Decision (EU) 2016/1251.
[125] EU Technical Measures Regulation ((EU) 2019/1241).

sites and other marine protected areas (MPA). The first report on its implementation[126] noted that, only 2 years after the entry into force of the regulation, some Member States have already started to develop additional fisheries measures to protect sensitive species and habitats at both the national and regional levels.

Targeted consultations of stakeholders in the Member States have also highlighted successful examples of technical and other innovations for sustainable fisheries with fewer discards, the closing of some marine Natura 2000 sites for damaging fishing gear or to avoid incidental catches of marine mammals. They have also reported on increasing engagement of fisheries stakeholders in biodiversity conservation efforts, in particular in the removal of marine litter and the recovery of lost fishing gear, reducing the risk of "ghost" fishing, ocean floor erosion and vectors of invasive alien species. However, bottom-disturbing fisheries, incidental catches of other species in fisheries and continued over-fishing of some fish stocks – including such shared with third countries - are identified as key challenges. They continue to severely impact some protected species such as the harbour porpoise, long-lived sturgeon, shark and ray species, benthic organisms and habitats (such as *Posidonia* seagrass meadows) (evidence from case studies in Spain, Italy, the Netherlands)[127].

Target 4 also aims to support the achievement of Good Environmental Status (GES) as required under the Marine Strategy Framework Directive (MSFD). In 2020, the Commission concluded that despite data inconsistencies[128] and missing reports from several Member States[129], evidence indicated that progress to reaching GES had not been enough[130]. Difficulties in defining threshold values[131], inadequate alignment between MS programmes of measures and identified pressures were (inter alia) noted as hindrances to achieving GES[132]. Nearly all of Europe's marine area (93%) is under various pressures from human activities and there is hardly any part of this area that is not affected by at least two such pressures. Comprehensive data on EU level trends of seafloor integrity is currently lacking, with estimates that approximately 35% of the European shelf area has been disturbed by unsustainable fishing practices[133]. Bottom trawling is a key pressure on the seafloor particularly within the demersal zone, although data indicates that such activities may be decreasing in some regions.

Further pressures on the marine environment exist that are beyond the immediate scope of Target 4, such as other seafloor damaging activities e.g. related to the extraction of marine minerals, pollution, invasive alien species and underwater noise. These pressures are being exacerbated by the increasing impacts of climate change and the acidification on oceans. Marine litter is present in all marine ecosystems. The trends and impacts of marine underwater noise are largely unassessed currently, yet various measures under the MSFD are currently in place to assess and mitigate underwater noise emissions[134].

[126] European Commission (2021). Implementation of the Technical Measures Regulation (COM/2021/583 final).
[127] See Annex 8, section 2.
[128] Between what is reported electronically and static text reports in MSFD reporting by MS.
[129] Member States' programmes of measures reports as part of Article 18 of the MSFD were not submitted by Bulgaria, Cyprus, Greece, Italy, Malta, and Portugal at the time of the publication of the Commission's Report on the implementation of the Marine Strategy Framework Directive (COM/2020/ 259 final).
[130] Review of the status of the marine environment in the European Union. Towards clean, healthy and productive oceans and seas - part 2 (SWD/2020/61 final).
[131] A range of values that allows for an assessment of the quality level achieved for a particular criterion, thereby contributing to the assessment of the extent to which good environmental status is being achieved.
[132] Review of the status of the marine environment in the European Union. Towards clean, healthy and productive oceans and seas - part 2 (SWD/2020/61 final).
[133] EEA (2020) Multiple pressures and their combined effects in Europe's seas. (European Environment Agency Briefing 18/2020).
[134] Review of the status of the marine environment in the European Union. Towards clean, healthy and productive oceans and seas - part 2 (SWD/2020/61 final).

Target 5 Combat invasive alien species

By 2020, Invasive alien species (IAS) and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS.

Significant progress was made in implementing the actions under Target 5 with the adoption of the Regulation on Invasive Alien Species (IAS) in 2014[135]. A list of IAS of Union concern was adopted in 2016, and updated in 2017 and 2019, reaching a total of 66 species[136]. Furthermore, revised Regulations on Plant Health and on Animal Health have also been introduced.

By the date of this evaluation, most progress has related to processes and outputs. Full implementation of the IAS Regulation only began in July 2019, 36 months after the adoption of the first Union list. On 13 October 2021, the Commission published its report on the review of the application of the IAS Regulation[137], primarily based on reports submitted by the Member States for the period 2015-18. While it is premature to draw conclusions on most implementation aspects of the Regulation, the report already identified some significant achievements, including:

- Information on the IAS occurring in Europe is now centralised and more complete than ever.
- Mechanisms and platforms are in place to support reporting and early warning of new detections[138].
- Most Member States have set up a surveillance system and carry out official controls for IAS on the Union List.
- There are indications that restrictions (e.g. removal of species from trade), early detection, rapid eradication and management of spread species deliver benefits.
- The number of early-detection notifications and of management measures taken indicates that the listed IAS of Union concern are relevant to most Member States.
- The IAS Regulation has led to increased awareness of the problem of invasive alien species, including among the general public.
- Most Member States have identified priority pathways relevant to them. Due to different methodologies, the identified pathways vary substantially. Two pathways were prioritised by most Member States: 'Escape from confinement: escape of pet, aquarium and terrarium species' and 'Escape from confinement: horticulture'.

The Regulation has encouraged coordinated action between countries[139,140], while the European Alien Species Information Network (EASIN)[141] has facilitated access to harmonised scientific information and on the distribution of around 14 000 alien species throughout Europe[142], leading to increased knowledge sharing and citizen involvement[143,144,145].

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[135] EU Regulation on Invasive Alien Species (Regulation (EU) No 1143/2014).
[136] See list of Invasive Alien Species of Union concern here.
[137] Commission Report on the review of the application of the Regulation (EU) No 1143/2014 (COM/2021/628 final).
[138] EASIN Notification System (Notsys).
[139] Council of Europe (2019) 13th meeting of the Bern Convention Group of Experts on Invasive Alien Species - Review of the Reports Submitted by Parties on Progress in the Implementation of the European Strategy on Invasive Alien Species and on the use of Bern Convention Codes of Conduct and Guidelines on IAS.
[140] Genovesi et al. (2015). EU adopts innovative legislation on invasive species: a step towards a global response to biological invasions?
[141] https://easin.jrc.ec.europa.eu/
[142] Magliozzi (2020). Assessing invasive alien species in European catchments: Distribution and impacts. *Science of the Total Environment, 732.*
[143] Best practices in citizen science for environmental monitoring (SWD/2020/149 final).
[144] EASIN citizen science.

At the same time, the review of the application of the IAS Regulation identified challenges encountered by the Member States, including:

- Continuing increase in newly introduced alien species many of which are likely to become invasive.
- Species can only be added to the Union list once sufficient evidence is available, and this may be hindered by their economic considerations, reducing the impact of the IAS Regulation.
- Listing species not yet present in the EU has a strong preventive effect but evidence necessary to complete a risk assessment is lacking, combined with uncertainties about the dynamics of biological communities and the effects of climate change.
- There is scope for improvement of the coverage of surveillance systems and official control structures in many Member States.
- There are knowledge gaps related to the implications of climate change and to novel methods for IAS management, in particular at pathway level.
- Uncertainty over the exact limits between the native and alien range of some species in the EU is a major obstacle to regional cooperation.

Despite clear progress in implementing the actions of the Strategy, IAS continue to exert significant pressure on EU biodiversity and ecosystems, both terrestrial and aquatic[146]. IAS of Union concern impact Atlantic and Continental regions disproportionately, but high potential impacts occur across all ecosystems and biogeographic regions. Implementation has started in all Member States, but Target 5 has not been achieved by the Target date 2020.

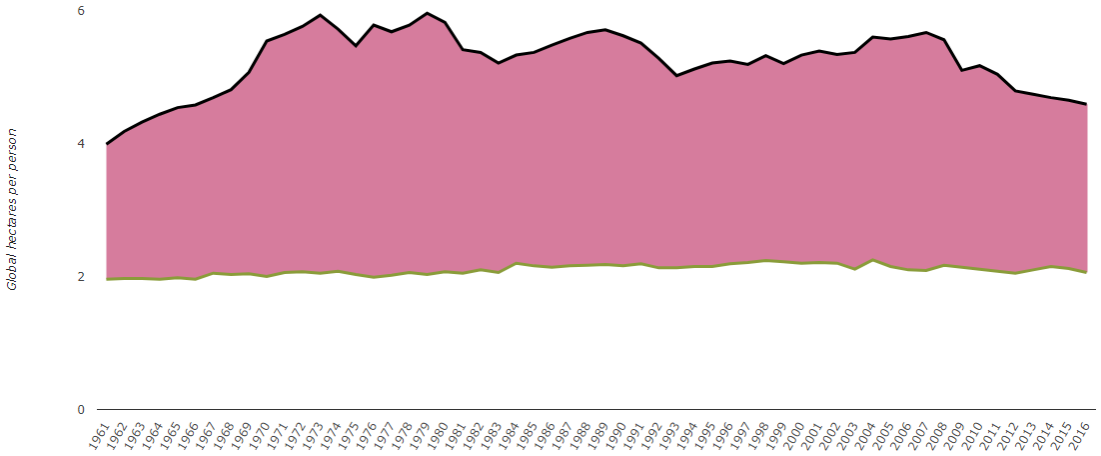
Target 6 Help avert global biodiversity loss

By 2020, the EU has stepped up its contribution to averting global biodiversity loss.

Progress to Target 6 has been limited. Biodiversity and ecosystem functions and services are deteriorating worldwide, as evidenced by the IPBES Global assessment of biodiversity and ecosystem services. The natural capital stock per person worldwide is estimated to have declined by 40% between 1992-14, with global biodiversity decline occurring faster now than at any time in human history[147]. The EU's (EU27+ UK) ecological footprint per person has been steadily falling since 2010, but this is largely due to a reduction in the carbon footprint. The EU still remains in a significant ecological deficit compared to its biocapacity, with over-extraction of resources within the EU or in other regions through the import and export of goods, or through the exploitation of global commons[148].

[145] EU academy MOOC: "Have you seen an alien?".
[146] EEA (2020). The European environment — state and outlook 2020 (SOER) (European Environment Agency 2020).
[147] Dasgupta et al., (2021) The Economics of Biodiversity: The Dasgupta Review.
[148] EEA (2021) Indicator Assessment - Ecological footprint of European countries.

Figure 6. EU-27 + UK Ecological footprint, biocapacity and ecological deficit per person



Source: EEA (2020) SEBI Indicator Assessment- Ecological footprint of European countries. Note: Black line= ecological footprint per person; red line= biocapacity per person; pink area= deficit

Positive developments are noted in relation to some of the actions set out under Target 6. International financial flows from the EU and its Member States for global biodiversity have been significant since the Strategy was published. The Hyderabad commitment to double financial resources for biodiversity to developing countries was achieved or exceeded by a number of Member States. The Bonn Challenge[149] launched in 2011 mobilised national commitments to restore 150 million ha of degraded forests globally by 2020. However, limited progress has been made on identifying and eliminating subsidies that are harmful for biodiversity. Several Member States have published studies, reviews and catalogues of such subsidies, but initiatives to reduce or eliminate them are at an early stage of development.

The EU has taken measures to tackle illegal trade, for example in timber as part of the implementation of the FLEGT Action Plan, and in wildlife as part of the EU Action plan against wildlife trafficking. Biodiversity-related provisions have been systematically included in the Trade and Sustainable Development chapters of EU trade agreements. However, detailed assessment of the biodiversity impacts of trade – and the monitoring and enforcement of these (non-binding) provisions – remain a challenge. There is evidence of limited progress in developing market signals to avert biodiversity loss[150], while comprehensive indicators and robust methods to substantiate trade impacts on biodiversity are still lacking[151].

EU external action has supported the implementation of the global Strategic Framework for Biodiversity 2011-2020, but it has not been able to curb global biodiversity loss which continues at unprecedented rate. There is a clear need to reinforce an integrated approach to biodiversity and development cooperation in the EU's external action, better connecting biodiversity targets with the SDGs, and ensuring coherence with internal EU policy developments.

[149] Restore our Future Bonn Challenge (2020) The Bonn Challenge.
[150] Commission Report on the application of Regulation (EU) No 978/2012 applying a Scheme of Generalised Tariff Preferences (COM/2018/665 final).
[151] Kuik et al. (2018) Trade Liberalisation and Biodiversity: Scoping Study: Methodologies and Indicators to Assess the Impact of Trade Liberalisation on Biodiversity (Ecosystems and Ecosystem Services). Final Report.

5.1.2 *Major achievements and challenges, and underlying factors*

- ***Evaluation question 2:*** *"What have been success factors and have successful approaches been shared and replicated?"*
- ***Evaluation Question 3:*** *"What have been possible gaps or challenges that have hindered progress towards the targets?"*
- ***Evaluation question 4:*** *"To what extent have stakeholders been actively engaged in the strategy's implementation and how have they been affected?"*

Overall response: Despite limited progress to the Headline Target, the implementation of the Strategy has been associated with a range of positive achievements and impacts, such as improvements in knowledge, successful local protection and restoration, increased biodiversity support opportunities in key EU policy instruments, as well as the adoption of a legal instrument to combat invasive alien species. A range of factors that can enable or hinder progress have also been identified, such as in relation to funding, coherence of objectives and the mainstreaming of biodiversity in other policy areas, the nature of the Strategy as an instrument, monitoring of biodiversity (beyond reporting under existing legislation), and of implementation efforts (including the tracking of funding). Contrasting views from stakeholders on the effectiveness of their engagement in the implementation of the Strategy were identified in literature, and throughout the consultation activities carried out as part of the evaluation support study.

What is the issue?

The implementation of the Strategy has been associated with a range of positive achievements as well as challenges to implementation. Many of these achievements and positive biodiversity trends are often localised and would need to be significantly up-scaled to measurably impact the overall negative trends in biodiversity. Furthermore, while some achievements are directly related to the Strategy implementation, attributing others directly to the Strategy remains challenging. This is largely due to the fact that many of the targets and actions of the Strategy or rely upon the implementation of other policies and legislation. Furthermore, the non-binding nature of the Strategy means that there were no reporting obligations and mechanisms linked to it (beyond those established under related legislation).

What are the findings?

Major achievements

There is significant evidence of **successful protection and restoration actions** on the ground, including a significant increase of species' assessments under the Habitats Directive that show favourable conservation status; the restoration of degraded vulnerable habitats and the return of many emblematic species, as well as the deployment of nature-based solutions and green infrastructure[152]. While projects financed to date often do not have the critical mass to reverse the heavy trends of biodiversity loss[153], such successful actions have **demonstrated the feasibility** of biodiversity protection and restoration, as well as the **benefits arising from healthy nature**.

The **Natura 2000 network** has been significantly developed and is almost complete on land. Greater Natura 2000 coverage positively correlates with the conservation status of

[152] For example restoration activities under LIFE projects (see brochure Bringing nature back through LIFE).
[153] Stepping and Meijer (2018). The Challenges of Assessing the Effectiveness of Biodiversity-Related Development Aid. Tropical Conservation Science Volume 11: 1–11.

habitats and species[154]. Under Target 1 of the Strategy, the Commission and the Member States have launched important processes that have supported implementation of the Nature Directives. For instance, the **biogeographical cooperation process**[155] has supported the sharing of experience and good practice, and cross-border action among authorities and stakeholders on the management of Natura 2000. Guidance has been developed to improve understanding of the requirements of EU nature legislation and to support authorities and stakeholders in its implementation and in ensuring compliance. In 2017, the Commission developed an Action plan for nature, people and the economy to tackle the main shortcomings identified in the fitness check of the Nature Directives. Many of its elements built on actions already undertaken under Target 1.

The **EU Green Infrastructure Strategy**[156] has encouraged the inclusion of green infrastructure measures in various national biodiversity strategies and plans and policy documents, such as on the sustainable development of coastal areas, climate change adaptation strategies, and EU urban policy[157]. It has also helped to mobilise support for green infrastructure under EU funding instruments. Increased political momentum and actions by cities to create green infrastructure have been noted in some Member States (as highlighted for example in the Germany case study, see Annex 8).

The biodiversity targets have also stimulated the development of a **range of instruments and measures in other policy areas, with a significant potential to support biodiversity** in the Member States, such as (i) Agri-environment-climate measures, and some Pillar I greening measures that support biodiversity (albeit with limited uptake), (ii) support for forest management plans including biodiversity measures[158], as well as (iii) measures under the Common Fisheries Policy with direct positive impact on marine biodiversity, such as the establishment of TACs, the implementation of closures to protect spawning and the implementation of technical measures to improve fishing selectivity..

A major achievement of the Strategy has been the development of a **dedicated legislative instrument on invasive alien species**: the EU IAS Regulation, to ensure coordinated action across the EU on invasive species included on the Union List. While implementation is in its early stages, some achievements have already been reported as highlighted under section 5.1.1.

The EU and its Member States' have increased their financial contributions to the conservation and sustainable use of global biodiversity in line with the EU's global commitments on resource mobilisation under the Convention on Biological Diversity[159].

A key benefit and achievement of the Strategy is the **formation and support to partnerships with a wide variety of stakeholders.** For instance, the Business@Biodiversity platform has helped businesses to develop tools to assess their impacts and dependencies on biodiversity and to better integrate biodiversity considerations within businesses decision-making. The BEST initiative (Biodiversity and Ecosystem Services in Territories of European overseas) has increased access to funding for biodiversity actions in the EU Outermost Regions and Overseas Countries and Territories through a small-grant scheme involving local stakeholders.

[154] Tucker et al. (2019) Study on identifying the drivers of successful implementation of the Birds and Habitats Directives. Final Report (IEEP 2019).
[155] Natura 2000 Seminars.
[156] EU Green Infrastructure Strategy (COM/2013/249 final).
[157] Review of progress on the implementation of the EU Green Infrastructure Strategy (COM/2019/236 final).
[158] NEPCon (2018). Study on Implementing Sustainable Forest Management According to the EU Biodiversity Strategy and the EU Bioeconomy Strategy.
[159] European Commission (2019). Investing in Sustainable Development - The EU at the forefront in implementing the Addis Ababa Action Agenda.

The implementation of the Strategy has resulted in **significant improvements of the knowledge base on ecosystems and their services**, in particular via the initiative on the Mapping and assessment of ecosystems and their services, with the involvement of national authorities and the science and research community in all Member States. The methodological framework developed under MAES was applied in the first EU-wide assessment of ecosystems and their services published by the Commission at the end of 2020. Member States have also developed initiatives to ingrain stakeholder involvement within the development of knowledge platforms and the collection of monitoring data (e.g. on IAS, or on pollinators), thus supporting both data collection and awareness raising.

Despite these successes, the Strategy has overall **failed to deliver on the headline target to halt and reverse biodiversity loss in the EU and globally.** It is therefore crucial to understand what underlying factors have driven success and failure.

Factors for success or failure

Challenges to the achievement of the Nature Directives have been highlighted in the fitness check of the Nature Directives (2016)[160] and included in particular: the availability and targeting of funding, knowledge gaps, insufficient stakeholder engagement, and human resource constraints, as well as weaknesses in the management of Natura 2000 sites and competing objectives with other sectoral policies. These findings concern the evaluation of the EU Nature Legislation rather than the Strategy, however these same challenges are valid in relation to the achievement of Target 1. At the same time, many of the Strategy's actions designed to support the implementation of the EU Nature Directives were aimed at tackling these same challenges.

Resources for implementation. Funding for biodiversity has increased since 2010 but, while there are differences between different EU funding instruments, overall it remains clearly insufficient. The Strategy did not specify the needs and set no **target on financing** for biodiversity in the EU, which was a major setback in securing the resources needed for implementation. Insufficient funding has been a key barrier to restoration[161], and was also commonly cited by stakeholders and authorities in the Member States' case studies[162]. In addition to inadequate finance, tracking expenditure on biodiversity has been challenging in some areas[163]. Information gaps on funding limited the assessment of its effectiveness and efficiency, for example in relation to Target 2, Target 3 and Target 6. The **lack of a comprehensive overview of harmful subsidies** has also hindered efforts for the removal of such funding in public and private financing, ultimately exacerbating not only biodiversity loss but also other forms of environmental degradation[164]. The EU has initiated some reforms to shift away from harmful subsidies to support for more sustainable practices, for example in relation to fisheries.

Policy integration. Mainstreaming and prioritising biodiversity objectives in other EU policies is essential, considering the complex interactions between biodiversity, the provision of ecosystem services, the impacts of land, water and sea use and management and the potential of nature-based solutions to contribute to wider environmental and socio-economic objectives. While policy integration was supported by several Targets

[160] Fitness check of the EU Nature Directives (SWD/2016/472 final).
[161] Cortina-Segarra et al. (2021) Barriers to ecological restoration in Europe: expert perspectives. *Restoration Ecology*.
[162] See Annex 8.
[163] Langhout, W. (2019). The EU Biodiversity Strategy: progress report 2011-2018. Langhout Ecologisch Advies.
[164] European Habitats Forum (2019) position paper on The implementation of the EU 2020 Biodiversity Strategy and recommendations for the post 2020 Biodiversity Strategy.

and increased under the Strategy, it has remained insufficient. This has posed challenges to tackling pressures, accessing funding for biodiversity and identifying synergies with other areas, including opportunities to deploy nature-based solutions. Approaches and uptake of biodiversity measures have been uneven across the Member States in the implementation of the Common Agricultural Policy, forest management plans and the Common Fisheries Policy. Many **direct and indirect pressures and drivers of biodiversity loss have persisted or increased**, with a significant proportion of these accelerating in recent times. In relation to EU Free Trade Agreements, impacts on biodiversity are often assessed through Sustainability Impact Assessments (SIA), yet details on the means of the assessment are often not specified and left to be determined by individual SIA coordinators. Last but not least, biodiversity loss and climate change are closely linked, yet the potential for synergies between improving ecosystem resilience and nature based solutions, on the one hand, and climate mitigation and adaptation, on the other, has not been sufficiently used.

Knowledge is essential for evidence-based decision-making on biodiversity (both public and private), robust policy development, implementation and monitoring. Gaps in data and monitoring or lack of access to data (including on pressures and on their impacts on biodiversity) have hindered progress in the implementation of the Strategy. Knowledge needs have been recognised and the Strategy encouraged the development and application of common methodologies for the mapping and assessment of ecosystems and their services, as well as approaches to better reflect the value of biodiversity and ecosystem services in decision-making[165]. Nevertheless, significant gaps in knowledge have remained underlining the need for a robust biodiversity observation network and more consistent ecosystem condition reporting.

The choice of policy instrument. The voluntary nature of the Strategy has been commonly cited by stakeholders and environmental organisations as a key reason for limited action and progress on the biodiversity agenda throughout Europe. While some targets aimed to support the implementation of existing legal obligations, or the development of new legislation, others relied entirely on a voluntary approach. This is particularly the case in relation to restoration efforts that have lagged far behind the 15% ambition set in Target 2. The absence of Restoration Prioritisation Frameworks (RPF) has weakened strategic planning, financing, implementation and monitoring of restoration activities. Such frameworks had been requested on a voluntary basis. In 2014, the Commission provided guidance to the Member States on their development in order to improve the quality, scale and consistency of ecosystem restoration, whilst also defining areas of intervention which can be used to target EU funds. However, RPF were developed by only very few Member States.

Clearly formulated, measurable targets. Many of the Strategy's targets and actions were not measurable or specific enough to guide implementation and enable the monitoring of results. For example, challenges to restoration have arisen from the **ambiguity of the 15% restoration target**[166]: the ecosystems it referred to[167], what restoration activities comprise, or how to measure the achievement of the objective[168]. The absence of baseline to define 'degraded' ecosystems was also mentioned by authorities and stakeholders.

[165] European Commission (2019). Guidance on integrating ecosystems and their services into decision-making (2019). Summary for Policymakers in Government and Industry.
[166] European Habitats Forum (2011) Detailed Response to the EU Biodiversity Strategy.
[167] Tucker et al. (2013) Estimation of the financing needs to implement Target 2 of the EU Biodiversity Strategy. (IEEP 2013).
[168] ECA (2020). Biodiversity on farmland: CAP contribution has not halted the decline. (European Court of Auditors Special Report No 13/2020).

Governance and clear responsibilities for implementation, co-ordination and cooperation between relevant stakeholders. While engagement of a range of actors in implementation has increased, and some structures for stakeholder engagement have been set up at the EU level and in the Member States, it is still considered insufficient[169]. Cross-border cooperation is often found to encounter communication issues due to language barriers, a lack of administrative structures in place, and a lack of clear policy direction by Member States to guide cross-border issues[170].

Last but not least, ***political priority*** given to biodiversity protection and restoration, especially vis-à-vis other policy objectives, is essential for successful implementation. Insufficient awareness of the value of biodiversity and policy support for the Strategy in the period of its implementation has been often noted as a key barrier in literature [171] and in the targeted consultations of stakeholders[172].

Views of stakeholders

Political will and leadership for biodiversity policy were mentioned repeatedly by authorities and environment organisations in the targeted consultations in the Member States. Stable and predictable national policy and legal frameworks, and a fair playing field, were seen as crucial by authorities, civil society organisations and sector stakeholders (in particular fisheries). A key ***barrier to achieving the Headline Target****, and indeed subsequent Targets, of the Strategy noted by multiple stakeholders, predominantly from environmental organisations, is the lack of legally binding legislation to incentivise Member States and stakeholders into action. Respondents to the consultations across policy areas and sectors consistently referred to insufficient financing, mainstreaming and stakeholder engagement for implementation. While funding was considered difficult to obtain for some priority initiatives, some case studies have revealed that available funding for nature and biodiversity measures was not always used, or in some cases transferred to other priorities. Authorities and environmental organisations have pointed to the need to raise awareness and understanding of the importance of natural capital and nature-related financial risk, in order to encourage greater private sector engagement. Private sector engagement has been regarded as a significant untapped potential to reduce pressures and mobilise funding for biodiversity.*

In relation to Target 1*, stakeholders and authorities in the Member States have provided evidence of both successful implementation and of major gaps or conflicts of interests. Key factors of failure cited include insufficient funding and human resources for implementation, the division of competences for conservation and for the management of natural resources, weak enforcement (regional government authorities and environment NGOs); governance deficits: low engagement of key stakeholders in the management planning of Natura 2000 sites, unresolved land use conflicts, administrative burden created by biodiversity provisions and insufficient compensation for land owners and users for incomes forgone (agriculture, forestry and fisheries stakeholders, environment NGOs), knowledge gaps and low biodiversity awareness (national and regional authorities, and environment NGOs)[173].*

[169] ECA (2017) More efforts needed to implement the Natura 2000 network to its full potential (ECA Special Report No 1/2017).
[170] WUR et al. (2017). Natura 2000 and Spatial Planning. Final Report
[171] Fisher et al., (2019) What is hampering the effectiveness of existing approaches that aim to restore biodiversity and ecosystem function and services? (An EKLIPSE expert working group report).
[172] See Annex 2 and Annex 8.
[173] See Annex 8, Section 2.

***In relation to Target 2**, factors mentioned by stakeholders include: (i) knowledge to enable restoration planning (national and regional authorities and experts), (ii) stakeholder engagement which is key to set restoration priorities and measures, identify potential conflicts and how to resolve them (sector stakeholders, environmental NGOs, authorities), (iii) binding restoration requirements to ensure that action is undertaken (environmental NGOs), (iv) human and financial resources for restoration, lacking in particular outside of protected areas and often deprioritised for biodiversity in the context for budget cuts (national and regional administrations).*

***In relation to Target 3A**, stakeholders have brought up a range of factors affecting farmer's uptake of biodiversity measures, including (i) insufficient nationally programmed measures and non-activation by the Regions of the Natura 2000 support measures (farmers' associations and environmental NGOs); (ii) insufficient funds to incentivise sustainable land and forest management (stakeholders across the board); (iii) increased complexity in accessing compensation for restrictions in Natura 2000 sites, too low premium ceilings, heavy administration and unclear rules creating difficulties especially for small farmers who often make the highest contribution to the protection of biodiversity (agriculture and forestry sector stakeholders, regional authorities). In some countries, environmental NGOs and sector stakeholders have raised concerns about the efficiency and transparency of spending. Experts from government and environmental NGOs have stated that conservation projects have been most successful and sustainable when planned at the landscape scale together with land users, and when they have also addressed the causes of species decline.*

***In relation to Target 3B**, stakeholders have highlighted insufficient collaboration and conflicting objectives between biodiversity conservation and forestry sector, with forestry stakeholders criticising the lack of engagement in the definition of protection measures. In Lithuania, NGOs have provided examples of Natura 2000 payments under RDP conditional on foresters' signing contracts that would commit them to biodiversity protection measures exceeding the period of compensation.*

***In relation to Target 4**, fisheries stakeholders have expressed frustration about being insufficiently engaged in the definition of actions to preserve marine biodiversity, and about their efforts and positive contributions being insufficiently recognised. Another concern has been that rules and restrictions to preserve marine biodiversity have not applied to all actors, for example third-country fleets, small-scale fishing boats (below 12 meters in length overall), and sectors other than fishing such as tourism, transport or extractive activities, diminishing the results of efforts undertaken to introduce more sustainable fishing practices (inputs from fisheries associations in Spain and Italy).*

***In relation to Target 5**, authorities and experts in the Member States have highlighted insufficient practical tools and expertise on the control and eradication of IAS and insufficient awareness and communication to citizens on the need to combat IAS. Adding some IAS on the Union list is problematic due to economic considerations, e.g. controlling the Japanese knotweed would require drastic solutions in sectorial regulations (e.g. the management of aggregates and soil movements, etc.), and the control of IAS that are pets is even more complex, including for ethical reasons (inputs from regional and local authorities, NGOs, research organisations). Regional authorities have reported operational difficulties in combatting invasive alien species especially in marine areas in the Mediterranean region, given the nature of the problem, due to current climate change trend and different forms of pollution.*

In relation to Target 6, *authorities in the Member States have pointed to advances and national programmes to address sustainable consumption are expected to have some positive effects in the future if they are backed with human and financial resources. However, these initiatives are in their infancy and there is currently no strategic integrated approach to tackling the key drivers of biodiversity loss (inputs from authorities and NGOs in Germany, Italy, Spain).*

Open text responses to the OPC survey *highlighted the benefits for habitats and species stemming from the implementation of the Birds and Habitats Directives and other forms of nature protection (EU citizens and NGOs); increased awareness (EU citizens, business) and bottom-up conservation approaches giving preference to regional/local rather than EU biodiversity measures (EU citizens, business, NGO, public authority). Other achievements mentioned included increased funding for protection (EU citizens, NGO); improved agri-environment payments (EU citizen and business); and the Regulation on Invasive Alien Species (EU and non-EU citizen). Key reasons for failure noted in open text responses were the lack of integrated, holistic approaches to halting biodiversity loss and conflicts in the management of biodiversity (EU citizens, academic) as well as diverging economic interests amongst actors in implementing biodiversity-related measures (EU citizens, academic).*

The formulation of the Strategy itself was regarded as a reason for failure particularly regarding the 'lack of enforceability' due to the non-binding nature of targets and actions (EU citizens, academic/research institution), and poor definition of some of the targets (EU citizens). Lack of enforcement was also noted by several respondents.

As part of the OPC, respondents were asked to reflect on the extent to which the Strategy governance had ensured ***effective engagement of stakeholders*** *in the design and implementation of EU biodiversity policy. Most respondents considered that it had either 'partially' or 'poorly' engaged stakeholders in implementation, in particular at national/regional levels, and in particular stakeholders in the forestry, agriculture and fisheries sectors. Stakeholders noted that the governance of the Strategy has contributed significantly to access of information on the state of biodiversity, improved awareness and engagement of various stakeholders, yet it has not achieved cooperation and coordinated action across policy areas.*

Quotes from stakeholder contributions:
"*the Strategy is an important anchor point but not central because it is not a legislative tool."* (Environmental non-governmental organisation.)
"*There is a disconnect between the strategy and local action. … To strengthen biodiversity work on the ground, the local governments should have a role both in the implementation and have a say in the developments*." (Local government authority.)

Reasons for failure to reach biodiversity targets from German perspective (excerpt from the Germany case study): *"The lack of legally binding targets in the EU Biodiversity Strategy to 2020 meant that the Länder were not obliged to engage and commit resources. Legally binding targets are crucial to ensure implementation. Without a legally binding component they are considered optional and are unlikely to receive political attention and sufficient funding."* (Environmental non-governmental organisation.)

Quotes from stakeholder contributions: "*...[the Coordination Group on Biodiversity and Nature[174]] was extremely useful for coordination amongst ourselves (NGOs) but in terms of breaking silos and reaching out to other administrations, that did not really happen. Even when the Commission were making presentations, DG Environment and DG Agriculture spoke separately. Having a proper governance mechanisms with a whole of government approach could be something to take to 2030."* (Environmental non-governmental organization.)
..."[the Business@Biodiversity platform has led to] businesses becoming more coordinated and active." (Business association.)

1.11. 5.2. Efficiency

5.2.1. Cost-effectiveness and socio-economic impacts

- ***Evaluation question 5:*** *To what extent has the Strategy been cost-effective? What factors could have improved cost-effectiveness by strengthening delivery of the targets while minimising unnecessary costs and avoiding administrative burden?*

Overall response: There are significant variations of magnitude in the estimates of the costs and benefits of implementation of the Strategy. Evidence and example of the costs of individual initiatives have been presented in the targeted consultations in the Member States. It is not possible, based on available evidence, to estimate the total spending needs, actual spending across all targets, the potential benefits from their full implementation as well as the costs incurred for stakeholders - or indeed to separate the actual costs and benefits incurred by the Strategy from those incurred by other policies.

Nevertheless, evidence overwhelmingly indicates that the benefits flowing from healthy ecosystems far exceed the costs related to their protection, restoration and sustainable management, across all biodiversity targets. Better understanding of these benefits and of approaches to tap into synergies with other policy objectives (for example, by deploying nature-based solutions) could have helped to mobilise further financing as well as boost wider policy objectives. Tracking of financing and its effectiveness has been a major challenge to implementation.

What is the issue?

Cost-effectiveness refers to the relationship between the resources used to deliver on the targets of the Strategy (or burdens and costs, including opportunity costs) and the benefits generated by their implementation. The relevant sub-questions for examining the cost-effectiveness of the components of the Strategy are (1) What are the costs incurred in delivering the Strategy? (2) What are the benefits produced by the Strategy and how do they compare to the costs? (3) How timely and efficient is the process for reporting and monitoring? and (4) Are there any factors that could have improved cost-effectiveness?

Several of the Strategy's targets and actions aim to stimulate the implementation of existing legislation. The exact effect of the Strategy on the implementation of these commitments cannot be estimated independently from the legal implementation. In these cases, the actual costs and benefits that arose solely from the implementation of the Strategy cannot be estimated. Therefore, the analysis of whether the Strategy has been cost-effective considers the cost-effectiveness of specific measures, and the extent to

[174] The Coordination Group for Biodiversity and Nature was the Commission's core expert group for the coordinated implementation of the EU Biodiversity Strategy for 2020. It brought together the Commission, Member States' nature and biodiversity authorities as well as EU level stakeholders and the European Environment Agency.

which such measures were implemented to give rise to actual costs and benefits. The analysis also presents evidence, where available, about the Strategy's influence on the emergence of these costs and benefits.

What are the findings?

In relation to Target 1, there are significant variances of magnitude in the estimates of the costs and benefits of implementation of the Nature Directives. The evidence overwhelmingly indicates that, independently of the level of their implementation, the benefits far exceed the costs. Earlier studies[175] have estimated the direct costs of maintaining the Natura 2000 network to be at least EUR 5.8 billion per year across the EU (including UK – excluding Croatia) for 2011, while acknowledging data challenges in this area. The benefits generated by the Natura 2000 network range from various ecosystem services to rural development benefits and have been estimated in the range between EUR 200 and EUR 300 billion per year across the EU[176]. An ongoing study based on the national Prioritised Action Frameworks (PAF) estimates the EU and national funding allocations to actions and sub-measures for Natura 2000 in EU-27 during the period 2014 – 2020 at around EUR 25.5 billion[177], or an estimated EUR 3.65 billion annually on average. This indicates that the financing needs of the network were probably not covered by the realised funding. The LIFE Nature and Biodiversity sub-programme under the EU multi-annual financial framework 2014-20 was set at EUR 1.2 billion, while also helping to mobilise national and other co-funding. For example, between 2014 to 2018, 24 LIFE Nature Integrated Projects had a cumulative mobilisation target of nearly EUR 1.4 billion.

Authorities in the Member States consulted for this evaluation have given indications that the Strategy prompted additional action at Member State level to expand the Natura 2000 network. While it can be inferred that the Strategy contributed to these investments, the outcome is unverifiable and the exact amount cannot be estimated.

In 2017, a European Court of Auditors' report on the implementation of Natura 2000 noted that the EU's approach to financing the Natura 2000 network has been to use existing EU funds, which is the competence of the Member States. The report referred to deficiencies in reliable information on the costs of the network and its financing needs from the EU budget, on actual EU funding up to 2013 and (planned) allocations for 2014-20, and on the conservation results from the support measures under EU funds for the Natura 2000 network.

In relation to Target 2, the specific actions largely aimed at addressing information gaps in relation to ecosystem services and developing strategic frameworks. It is not possible, based on available evidence, to establish the causal link from these actions to impacts on the ground.

Action 5 (Mapping and assessment of ecosystems and their services) has generated minimal costs for research, mapping and assessment.

The one-off costs of the restoration and maintenance of 15% of degraded ecosystems has been estimated at around EUR 9.6 billion. The additional costs for maintaining all restored ecosystems in good condition were estimated at EUR 618 million to EUR 1,660 million per year. Restoration activity has been significantly below what would be required to fulfil Target 2, and the realised total expenditure during the 2010-2020 period

[175] Gantioler et al. (2010). Costs and Socio-Economic Benefits associated with the Natura 2000 Network. Final report.
[176] P. ten Brink et al. (2011) Estimating the Overall Economic Value of the Benefits provided by the Natura 2000 Network. Final Report.
[177] N2K Group and IEEP, (in prep.) Strengthening investments in Natura 2000 and improving synergies with EU funding instruments.

is significantly lower. The total actual costs of Target 2 implementation activities in 2016 have been estimated at between EUR 4.8 million and EUR 33.1 million; however, this estimation is highly uncertain. Green infrastructure investments have received around EUR 915 million per year by public EU funds between 2014 and 2020[178].

The overall benefits cannot be easily monetised due to a lack of systematically collated evidence on the restoration activity undertaken under Target 2 in the EU, but the total economic activity associated with ecosystem restoration has been estimated to be between EUR 11.5 and EUR 79.5 million. Although these estimates are highly uncertain, they indicate that restoration activity generates higher benefits than costs. The cost-effectiveness of restoration is contextual as it depends on factors such as the type of ecosystem being restored, competing uses of the site (land or marine area), restoration approaches and the value of ecosystem services such as crop pollination, carbon sequestration, outdoor recreation and flood protection.

In relation to Target 3A, the analysis focuses on support under the Common Agricultural Policy (CAP) since all target actions are implemented under the CAP. The CAP 2014-2020 provided a range of instruments to support biodiversity.

According to the evaluation of the CAP impacts on biodiversity, it is difficult to draw conclusions on the contribution of the CAP instruments and measures to the conservation and restoration of biodiversity and landscapes. This is due to uncertainties in particular regarding the indirect effects of direct payments, as well as the impacts of measures which depends on the scale of their coverage and their proper implementation**.**

Nevertheless, available evidence indicates that some CAP instruments and measures (in particular the AECM, the Natura 2000 measure, and the ESPG greening measure) have made significant contributions to the conservation, and to a lesser extent restoration, of semi-natural farmland habitats and their species. However, payment rates were not always sufficient to motivate farmers to commit to these measures. Greater benefits could have been secured from the available budget, had Member States allocated more of this funding to measures which deliver benefits for biodiversity most effectively, such as the AECM and Natura 2000 support measures, rather than to other measures such as areas of natural constraints[179].

CAP measures have not sufficiently counteracted the pressures on biodiversity from agriculture and there is room for improvement regarding the design of policy measures to ensure more effective, efficient and coherent outcomes.

The main costs associated with the implementation of Target 3B refer to the development, update and implementation of management plans for forests. The cost of developing and implementing Forest Management Plans as well as the benefits they have generated could not be found in the literature and the case studies in the Member States. Funding for forestry-related actions was mostly realised through the Rural Development Programmes (RDPs). In addition, the Natural Capital Financing Facility leveraged up to EUR 150 million for forestry projects on payments for ecosystem services, green infrastructure, innovative pro-biodiversity and adaptation investment, and biodiversity offsets[180]. However, EEA (2016) indicated that payments for forest ecosystem services have contributed only a minor amount to the income of forest owners[181].

[178] Trinomics et al., (2016) Supporting the Implementation of Green Infrastructure. Final Report.
[179] Evaluation of the impacts of the CAP on biodiversity, soil and water (natural resources) (SWD/2021/424 final).
[180] EFI et al. (2019) Study on progress in the implementation of the EU Forest Strategy. Final report.
[181] EEA (2016) European forest ecosystems: state and trends (European Environment Agency Report No 5/2016).

In relation to Target 4, the efficiency question refers mostly to the cost-effectiveness of achieving biodiversity-related objectives of the CFP and MSFD, on the results of which there is no concrete quantitative evidence in literature. While a comprehensive overview of the costs and benefits of actions related to Target 4 is not present throughout literature, the EMFF Annual Implementation Reports give a rather comprehensive overview of the support measures directly and indirectly benefitting marine biodiversity. Funding allocated to biodiversity through the European Maritime and Fisheries Fund (EMFF) is estimated at around EUR 199 million in 2015, EUR 134 million in 2016, EUR 136 million in 2017, EUR 90 million in 2018, and EUR 128 million in 2019. In 2020, Member States committed a total of EUR 1,637 million of EMFF funding to measures that potentially contribute to the protection and restoration of biodiversity[182]. This includes funding directed to measures for the protection and restoration of marine biodiversity. When including broader measures which have the potential to contribute to biodiversity, the figures are significantly higher. EU and international studies have shown that investments in protection of fisheries and marine biodiversity can generate high economic returns in enhanced yields, higher quality fish products, and tourism.

In addition to the important role of the EMFF in supporting the Member States to reach Good Environmental Status, funding has also been available from the LIFE Programme, research and structural funds. The EU LIFE Programme has supported the identification and designation of marine Natura 2000 sites, spatial planning, stakeholder engagement and trialling of limited habitat restoration techniques. However, there have been very few projects and – mostly local - success stories in marine habitat restoration. This is related to the lack of viable and tested restoration methods for most marine habitats, and data gaps that make it difficult to determine what measures may be necessary. The number of projects dealing with marine habitat conservation has been increasing recently.

In relation to Target 5, the costs that arise from the Invasive Alien Species Regulation were estimated in the accompanying Impact Assessment to be around EUR 1.43 billion per year[183]. Most Member States were not able to give estimates of the costs incurred, in their implementation reports under Article 24 of the IAS Regulation. Costs for IAS management are rarely attributed to exclusively IAS-related projects, but are often integrated with other objectives and procedures. The costs of tackling IAS through regulation include costs to the EU and national governments of the intervention itself, direct costs to affected parties in responding to the regulation, and indirect costs (opportunity costs) to those whose activities might be impeded by the intervention.

The benefits of tackling IAS can be presented as avoided cost of damage from IAS to ecosystems, human health, infrastructure and agricultural losses. These damages were estimated to cost the EU at least EUR 12 billion per year in 2009[184]. The figure is considered to be an underestimate , as it refers to a previous decade situation, and the IAS problem has since then steadily grown. Evidence suggests that the net benefits from controlling IAS will be increasing as the Regulation implementation advances.

It is notable that the cost-effectiveness of preventative measures and early intervention far exceed the cost-effectiveness of IAS management once an invasive species has become

[182] European Commission (2020). FAME SU, EMFF implementation report 2019.
[183] Impact Assessment accompanying the Proposal for a Council and European Parliament Regulation on the prevention and management of the introduction and spread of invasive alien species (SWD/2013/321 final).
[184] Kettunen et al. (2009) Technical support to EU strategy on invasive species (IAS) - Assessment of the impacts of IAS in Europe and the EU. (IEEP, 2009).

established[185]. As such, the boost to IAS preparedness and the additional expenditure by Member States in response to the IAS Regulation is likely to be a highly cost-effective expenditure. The Commission's report on the application of the IAS Regulation[186] noted that the cost estimates by the Member States of complying with the IAS Regulation over the period 2015-18 ranged from EUR 17,000 to EUR 40 million per Member State for measures such as management, awareness-raising and in some cases also personnel and other costs. Since these estimates do not cover the same cost categories and have various limitations, comparisons are not meaningful. Most Member States considered that reported costs are an underestimation. Member States were mostly unable to quantify the overall costs, since implementation activities are carried out by public bodies as part of their existing work or capacity (e.g. for official controls and surveillance systems). In addition, some activities are undertaken by many different players at national, regional, and local levels, making it difficult to collate all the costs. There are knowledge gaps in methods to document the costs and benefits of addressing IAS.

In relation to Target 6, financing from the Commission, Member States and private sources for global biodiversity has increased significantly since 2010. Between 2011 and 2015, the EU has invested more than EUR 1 billion in biodiversity-related projects outside of its borders and had earmarked EUR 1 billion more for the period 2014-2020. The EU has spent around EUR 340 million on projects implementing wildlife trafficking-related actions in countries in Africa, Asia, and South America. However, estimates of the scale of benefit delivered from this expenditure, and the scale of attribution to the Strategy, are not possible based on available evidence. Evidence on cost-benefit analysis of implementing of the Nagoya Protocol is not available. The High-Level Panel on Resource Mobilization estimated that the resources required for building and developing capacity for the Nagoya Protocol (one-off investments over 2013 to 2020) without any recurring costs, for 197 countries, ranges between US$55 million and US$313 million (EUR 49.55 million to EUR 282.000 million). It is not possible to estimate the benefits for the EU-27 resulting from this international biodiversity action but scientific literature indicates that the global value of crop pollination, water purification, flood protection and carbon sequestration reach up to US$125-140 trillion (EUR 108-121 trillion). The global cost of inaction has been estimated at around US$4-20 trillion (EUR 3.5-17.5 trillion) per year in ecosystem services from 1997 to 2011.

Stakeholder views

Further examples of costs[187] and benefits[188] are presented in the summary of the targeted consultations in the Member States. Only a small minority of the respondents in the OPC considered that funding for any of the targets had been fully sufficient. Funding for Target 1 was deemed fully or partially sufficient by just over half of the respondents (51%) while most respondents considered that funding was poorly or not at all sufficient for Target 5. Industry, health and culture sector representatives provided the greatest share of responses identifying funding as 'fully' sufficient to support the implementation of Target 2. The tourism, leisure and education sections provided the greatest proportion of 'poorly' responses.

[185] Arthur, Summerson, & Mazur (2015) A comparison of the costs and effectiveness of prevention, eradication, containment and asset protection of invasive marine pest incursions ABARES report to client prepared for the Biosecurity Animal Division of the Department of Agriculture, Canberra, June.
[186] Commission report on the Review of the application of the IAS Regulation (COM/2021/628 final).
[187] See Annex 8, section 3.1.
[188] See Annex 8, section 3.2.

5.2.2. *The Strategy as an instrument*

Evaluation question 6: *Was the Strategy the most appropriate instrument to achieve the EU biodiversity targets to 2020?*

Evaluation question 7: *How timely and efficient was the process for reporting and monitoring?*

Overall response: The Strategy has had an important role in providing a coherent, strategic EU level framework giving rise to political commitment, setting common targets, actions and mechanisms for their coordinated implementation and progress tracking, and providing links with other relevant EU policies and legislation. At the same time, the Strategy constituted a largely voluntary framework within which a range of instruments, from voluntary to binding ones, needed to work together to ensure delivery.

The review of implementation experience highlighted areas within this wider strategic framework where voluntary mechanisms and incentives had worked well either on their own or in support of existing EU legislation, as well as instances in which reliance on voluntary instruments alone had not been sufficient to ensure delivery. The evaluation indicates that voluntary instruments have played an important role in certain contexts, but a reliance on voluntary instruments alone has been a significant cause of the failures in effectiveness and cost-effectiveness of the Strategy's targets. For the operationalisation of the biodiversity targets, the Strategy could have benefited from a different combination of regulatory and market-based instruments.

What is the issue?

A number of potential policy instruments could be considered to achieve the EU headline target – namely i) regulatory instruments; ii) market-based and financing instruments, and iii) voluntary instruments[189]. This question examined whether alternative policy tools would have had the potential to better deliver the targets in a cost-effective manner. The objective is to assess whether a different policy mix could have improved the implementation of the Strategy.

What are the findings?

The broad scope of biodiversity policy implies the need for a range of different instruments, from voluntary to legislative, that are tailored to ensure delivery of specific targets, while also being complementary so that together, they can lead to the achievement of the overarching biodiversity objective.

Implementation experience highlighted areas of this wider strategic framework within which **voluntary mechanisms and incentives** resulted in significant action by supporting motivated stakeholders to engage in biodiversity efforts. This is for example the case of cooperation between front-running businesses in the EU Business@Biodiversity Platform, through which the Commission facilitates experience exchange and the development of tools to measure companies' dependences on natural capital, and to improve their biodiversity impacts. Another example is the development of green infrastructure in EU regions and cities that had already set for themselves ambitious biodiversity objectives. In such cases, there was already high motivation among certain actors to undertake measures in support of biodiversity, and the Commission facilitated these measures by providing strategic guidance, technical support, funding opportunities and platforms for exchange.

[189] EEA (2005) Market-based instruments for environmental policy in Europe (European Environment Agency Technical Report No 8/2005).

In other instances, voluntary instruments worked very well in support of the implementation and enforcement of EU legislation in the Member States. For example, the Commission provided guidance on Natura 2000 management that helped actors in different sectors in ensuring compliance with the legal obligations. Another example is the biogeographical cooperation process facilitated by the Commission, which brought together Natura 2000 managers and stakeholders at the level of the biogeographical regions to discuss common challenges and work on common solutions.

However, reliance on voluntary instruments alone was clearly not sufficient to ensure delivery in some areas. This was the case in particular when urgent, strategic and large scale action was needed, such as in the case of one of the most important biodiversity targets to reverse biodiversity loss: Target 2 to restore at least 15% of degraded ecosystems in the EU. Voluntary guidance and invitation by the Commission were not followed by the necessary scale of action at the national and local levels, and there was no reporting obligation or mechanism to enable progress tracking or enforcement. The lack of EU legislation also presented a challenge to mainstreaming, in particular to securing funding for restoration from EU funding instruments in other policy areas.

Legislative and regulatory instruments are the main tool for environmental policy and have been widely used at EU level. According to the EEA Report on the State of the Environment and Outlook (SOER 2020), there are significantly fewer binding targets for biodiversity than for other environment areas, such as climate change, air pollution, waste, and chemicals. When biodiversity policy objectives and targets are not met (as has been the case for several consecutive biodiversity policy instruments), there has been a tendency to reiterate them, and extend the timeframe for their achievement. SOER 2020 points to six key areas for bold action, one of which is the development of systemic policy frameworks with binding targets to mobilise and guide actions across actors and levels. The lack of legislative teeth of many of the Strategy's actions has been one of the major drivers of its limited implementation.

It was a clear conclusion of the evaluation support study[190] that the reliance on voluntary instruments in key areas had been a significant cause of the Strategy's failures in effectiveness and cost-effectiveness. The EP Resolution of January 2020 also called upon the Commission to "move away from voluntary commitments and to propose an ambitious and inclusive Strategy that sets legally (and, consequently, enforceable) binding targets for the EU and its Member States".

Regular progress monitoring and reporting took place under EU legislation, in particular the EU Birds and Habitats Directives, which has served as a basis to track progress towards several operational targets and the headline target. The SEBI indicators updated by the EEA, and the Member States' national reports to the Convention on Biological Diversity have provided valuable information for the mid-term review of the Strategy, as well as for its final evaluation. Monitoring and reporting under relevant EU policies, in particular the Common Agricultural Policy and the Common Fisheries Policy, have also provided information on progress to Target 3 and Target 4. Some voluntary reporting has also occurred, for example on national progress in implementing the EU MAES initiative. However, the voluntary nature of the Strategy has impacted the data and evidence available at EU level, in particular in relation to restoration efforts, as no reporting obligation was set by the Strategy on the Member States.

[190] Trinomics B.V. (2021) Support to the evaluation of the EU Biodiversity Strategy to 2020. Final study report.

Views of stakeholders

Several literature sources as well as consulted stakeholders considered the non-binding nature of the targets and actions as an important shortcoming of the Strategy. Several stakeholders – in particular environmental non-government organisations and citizens - mentioned in the targeted consultations and in the OPC that regulatory instruments should have had a greater role in the targets of the Strategy, as they would increase compliance and would have better reflected the urgency of tackling biodiversity loss. Sector stakeholders further stressed that adequate financing and incentives were key to motivate, compensate and reward farmers, land owners and fishers for biodiversity measures and for the provision of ecosystem services.

5.2.3. Socio-economic impacts

Evaluation question 8.1: *What significant positive and/or negative long-term and/or short-term socio-economic impacts has the Strategy implementation had?*

Evaluation question 8.2: *What have the main socio-economic impacts been, within the EU and globally, of any identified failure to achieve the EU biodiversity targets?*

Overall response: Implementation of the Strategy has created significant business and income opportunities through direct jobs in nature protection, restoration and sustainable use, as well as further benefits related to ecosystem services such as the provisioning of clean air and water, climate regulation, carbon sequestration, disaster risk reduction and mental and physical health benefits from interacting with nature. The Strategy implementation has in some cases incurred costs for stakeholders related to implementation of the actions, administrative burden as well as opportunity costs of foregone activities.

The Strategy has not fully achieved any of its Targets. This means not only that the full benefits of the Strategy's targets and actions have not materialised, but also that natural capital and ecosystem services have further deteriorated due to worsening ecosystem degradation and biodiversity loss. The socio-economic implications of this failure to achieve the Strategy's targets is significant although it cannot be estimated precisely. For instance, a study estimated that the failure of meeting the objectives of the Nature Directives can cost up to EUR 10.5 billion to EUR 15.7 billion per year in 2018 prices[191]. Other socio-economic impacts, such as health impacts, social vulnerability, deterioration of quality of life and safety, including increased disaster risks, can also emerge due to the failure to protect biodiversity and the resulting degradation of ecosystems and their services.

Human induced biodiversity loss is one of the main drivers of outbreaks of infectious diseases[192] that can have a profound negative impact on the global population and the economy, as became evident in the recent Covid-19 pandemic. Biodiversity loss also undermines efforts to mitigate climate change and adapt to its inevitable impacts.

What is the issue?

Conservation activities can often have short-term and long-term positive[193] socio-economic impacts, generating income and jobs in the conservation sector as well as

[191] COWI, Eunomia, Consulting Ltd (2019). Study: The costs of not implementing EU environmental law. Final Report.
[192] Loh et al. (2015). "Targeting Transmission Pathways for Emerging Zoonotic Disease Surveillance and Control", Vector-borne and Zoonotic Diseases, Vol. 15/7.
[193] Acknowledging that short-term impacts can include negative socio-economic effects such as displacement or limitation of fishery activities following the designation of marine protected areas.

income in other sectors, such as tourism and recreation. They can also incur costs for the implementation of conservation measures, create administrative burden as well as opportunity costs related to limitations on certain economic activities. At the same time, failure to halt and reverse biodiversity loss comes at an enormous environmental, social and economic cost to society as well as risks to present and future generations.

What are the findings?

In relation to Target 1, the fitness check of the Nature Directives[194] and a range of studies[195,196,197] indicated that the flexible system[198] of protection of Natura 2000 has had a positive impact and a potential to generate business opportunities and incomes from sustainable socio-economic activities. Moreover, studies have shown that the effect of access to nature on life satisfaction is of similar magnitude to that of income[199]. National parks can generate substantial employment both within the park and indirectly in the tourism sector in the broader region[200]. Some negative socio-economic impacts have resulted from restrictions on socio-economic activities especially in Natura 2000 sites[201]. Overall, the evidence suggests that despite some negative socio-economic impacts, the costs of implementation are reasonable and the total costs are outweighed by the total benefits, although they do impact some stakeholders more than others.

In relation to Target 2, restoration and the deployment of green infrastructure have contributed to a range of socio-economic benefits linked to improved air and water quality, flood control, noise reduction, recreation and social opportunities, and health. The restoration of forest, wetlands and other ecosystems has brought millions of euros in savings across the EU due to lower water retention and purification costs[202,203]. Urban green infrastructure can generate multiple benefits in the form of enhanced health and well-being[204]. According to some estimates, 110,000 direct full-time jobs each year can be supported by investment needed to achieve Target 2 (restoration of 15% of degraded ecosystems)[205]. Additional investments in restoration in the range of EUR 506 million to EUR 1,750 million per year would likely result in 15,000 to 50,000 full-time jobs[206].

However, very little of the required investment has materialised and thus most of these jobs were not created. The data available on the actual level of implementation does not allow for an analysis of the exact job creation and positive or negative socio-economic impacts of the implementation of Target 2. Nevertheless, there is ample evidence in the literature of the costs and benefits of ecosystem restoration projects, as well as from the deployment of green infrastructure.

In relation to Target 3, socio-economic benefits mainly relate to employment and income generation through sustainable agricultural and forestry practices. The CAP has provided payments to farmers and foresters to encourage sustainable practices and protect

[194] Milieu, IEEP, ICF (2016). Evaluation study to support the Fitness Check of the Birds and Habitats Directives, Final Report.
[195] Mutafoglu et al., (2016). Natura 2000 and Jobs. Scoping Study.
[196] GHK (2011). Evaluating the Potential for Green Jobs in the next Multi-annual Financial Framework. Final Report.
[197] BIO Intelligence (2011). Estimating the economic value of the benefits provided by the tourism/recreation and Employment supported by Natura 2000. Final Report.
[198] This refers to allowing socio-economic activities to take place within designated Natura 2000 sites, provided they can be implemented in harmony with the site biodiversity objectives.
[199] Methorst et al. (2021). The importance of species diversity for human well-being in Europe. Ecological Economics, 181, 106917.
[200] Nunes et al., (2011) The Social Dimension of Biodiversity Policy. Final Report.
[201] See Annex 8.
[202] EEA (2016) European forest ecosystems: state and trends (European Environment Agency Report No 5/2016).
[203] Siuta and Nedelciu (2016). Socio-Economic Benefits of Wetland Restoration in Central and Eastern Europe. (CEEweb for Biodiversity, 2016).
[204] EEA (2019) Healthy environment, healthy lives: how the environment influences health and well-being in Europe (European Environment Agency Report No 21/2019).
[205] ICF (2012). The EU biodiversity objectives and the labour market: benefits and identification of skill gaps in the current workforce. Final Report.
[206] Eftec (2017). Promotion of ecosystem restoration in the context of the EU biodiversity Strategy to 2020. Final Report

or restore species and/or habitats through agri-environment-climate and other rural development measures. According to a study undertaken for the European Commission, investing EUR 1 billion per year in agri-environment measures could create 6,600 additional jobs (FTE). Income generation in organic agriculture is still quite limited compared to conventional agricultural and forestry practices; however, there is a clear upward trend, which is expected to continue increasing[207] driven by more ambitious policy targets set for 2030, and increasing demand.

The evaluation of the CAP impacts on biodiversity concluded that the measures with the greatest benefits for biodiversity and soil are also those with the greatest administrative cost, due to the complexity of some management practices requiring support. Administrations and farmers found support for organic farming less difficult to manage than AECM. The administrative costs associated with verifications of cross-compliance and greening measures were significant but necessary, and they were included in the general management system of the CAP. Controllability of soil-related GAECs has been a major concern for administrations because of the high associated costs and financial risks for farmers in case of non-compliance. Some Member States increased the administrative complexity for themselves by deciding to give farmers EFA options which were already covered by cross-compliance standards (GAEC).

Data on the direct socio-economic impacts of Target 3B and the accompanying actions is limited. Developing and implementing Forest Management Plans directly creates jobs for forest engineers, forest technicians and foresters, but this benefit is marginal compared to the indirect socio-economic benefits for wider society derived from sustainably managed, healthy forests in terms of services such as climate regulation, flood control and nature-based recreation, as well as tourism opportunities and forest products[208]. An estimate of the direct socio-economic impact of the Strategy cannot be provided based on available evidence.

A few studies have looked at the possible negative socio-economic impacts due to the implementation of Target 3A and 3B and their accompanying actions, mostly related to conflicts between biodiversity-related measures, and farmland use and income. Crop diversification under CAP greening limits farmers' ability to choose which crops to produce that may lead to lower farm income. The permanent grassland ratio requirement could potentially also lower farmers' income, while some protected species whose numbers have been increasing can cause crop losses.

In relation to Target 4, fisheries play a crucial role for employment and economic activity in several EU regions – in some European coastal communities the fishing sector accounts for as many as half the local jobs[209]. Restoring fish populations and maintaining marine ecosystems can have substantial socio-economic benefits in income and jobs due to both increasing fish harvest and generating locally more tourism and recreation opportunities. Healthier fish stocks result in better economic performance of the EU fleet[210]. The total socio-economic benefits of marine protected areas go beyond food provision, and include tourism, coastal security, climate mitigation and research. MPAs in southern Europe generate an estimated EUR 640,000 per MPA in income from services to non-resident recreational users[211]. The possible negative socio-economic impacts due to the implementation of Target 4 and its accompanying actions have not been comprehensively examined by the relevant literature. The OPC as well as survey

[207] Eurostat (2020) Organic operators by status of the registration process (from 2012 onwards). Database.
[208] Vallecillo et al. (2019) How ecosystem services are changing: an accounting application at the EU level.
[209] EC (n.d.) Oceans and fisheries facts and figures - Employment.
[210] Towards more sustainable fishing in the EU: state of play and orientations for 2021 (COM/2020/248 final).
[211] Russi et al. (2016) Socio-Economic Benefits of the EU Marine Protected Areas. (IEEP 2016). Final Report.

and interviews in the case study Member States have indicated socio-economic impacts that mainly relate to MPAs and fishing-related restrictions, which give rise to short run opportunity costs. However, it should be noted that the costs and benefits of MPAs vary significantly depending on the context of their implementation[212].

In relation to Target 5, there is little literature evidence on the actual direct socio-economic consequences from tackling IAS in Europe, in terms of income and employment generation, due to the early stages of implementation and reporting on the IAS Regulation. Employment opportunities for the removal of invasive species and administration positions have been estimated to be between 520 and 2,520 FTE staff annually. Socio-economic impacts are duly considered when deciding whether to include an IAS in the Union list. There are cases where IAS may represent a valuable resource for local communities. Targeting these species may result in loss of jobs and income for a certain stakeholder group. For example, the invasive red swamp crayfish *Procambarus clarkii* in Spain negatively impacts agriculture while it contributes to the income of several hundred local fishermen[213]. The American mink *Neovison vison* was introduced for fur farming and continues to be of economic importance in the fur industry in several Member States. The species was considered for inclusion in the Union list but continuation of the fur farming would be possible under Article 9 authorisation system. The resulting administrative burden though was deemed too high and the species was not listed. The water hyacinth *Eichhornia crassipes* was a popular aquatic plant providing significant annual revenues to the horticultural sector mostly in Northern Europe. The decision to list the species was based on the estimation that future invasions , related management costs and costs to impairment of activities such as water transportation, water quality and fisheries would be much more significant than the income losses for horticultural trade or other known uses.

The review of the application of the IAS Regulation noted that the Union list is a priority list, to which species can be added only once sufficient evidence is available. Uncertainty about potential impacts or the economic significance of certain species may hinder their inclusion in the Union list, thus reducing the impact of the IAS Regulation. Costs are borne by economic sectors that have to adapt their activities (e.g. pet and horticultural traders who must stop trading IAS of Union concern, and zoos that must take measures to ensure that specimens do not escape and do not reproduce). Some stakeholders (for instance those trading alien species) argue that the Union list already includes too many species and that the implementation burden is too heavy.

Benefits include the avoided adverse impacts on biodiversity, human health (e.g. skin burns caused by the giant hogweed *Heracleum mantegazzianum*) and the economy (e.g. damage to infrastructure), as a result of preventing new introductions and of managing existing populations of IAS of Union concern. Damage and management costs tend to increase substantially over time, however there are no comprehensive estimates of these benefits in monetary terms. Studies[214] confirm the statement in the impact assessment for the IAS Regulation[215] that the cost of addressing IAS as early as possible is clearly outweighed by the costs of delayed action or inaction.

[212] ICF, IEEP and PML, (2018) Study on the economic benefits of MPAs. Final Report
[213] EEA (2012) The impacts of invasive alien species in Europe (European Environment Agency Technical report No 16/2012).
[214] See Cuthbert R.N. et al. 'Global economics of aquatic invasive alien species' Science of the Total Environment 775 (2021); Ahmed D.A. et al. 'Managing biological invasions: the cost of inaction', Biological invasions (2021) In review..
[215] Impact Assessment accompanying the Proposal for a Council and European Parliament Regulation on the prevention and management of the introduction and spread of invasive alien species (SWD/2013/321 final).

In relation to Target 6, healthy ecosystems are of vital importance for sustainable development and poverty eradication. About 40% of the total world employment is sustained by sectors that are directly or heavily dependent on ecosystem services[216]. Ecosystem degradation damages human health and well-being and economic activity, increasing the vulnerability of farmers, fishermen, and rural communities who depend on natural capital. It also undermines global efforts to mitigate and adapt to climate change and to achieve the sustainable development goals. The reduction of indirect drivers of biodiversity loss, mainly related to the mitigation of the ecological footprint of the European production and consumption patterns, is likely to entail opportunity costs on certain economic activities, in particular in the short run, but also bring long-term benefits from the preservation and enhancement of natural capital. The mobilization of additional resources for global biodiversity has created jobs and income for companies and organizations outside of the EU, including in restoration, sustainable management and protection activities, in fighting wildlife crime and in tackling illegal, unreported and unregulated fishing. However, the job and growth impacts of biodiversity-related development cooperation and international partnerships have not been comprehensively estimated in the literature. A more integrated approach in EU external action in support of global biodiversity could have resulted in further synergies and socio-economic benefits by connecting biodiversity conservation and sustainable development objectives. Finally, while the Nagoya Protocol aimed to contribute to a more equitable access to and the benefit-sharing of genetic resources, its effectiveness has been disputed by a number of third countries.

Views of stakeholders

Asked about whether they had identified significant positive or negative impacts from the implementation of the Strategy on their sector, field of activity or living area, almost half of all respondents to the OPC identified significant impacts since 2011 (48%), with almost equal numbers of respondents identifying positive (58%) or negative (42%). Environment and forestry sector stakeholders provided the largest proportion of 'yes-positive' responses within their groups, whereas the majority of industry stakeholders responded that they had not identified any significant impacts.

The targeted consultations in the Member States have provided a wealth of examples of benefits from the Strategy's implementation[217], and indicated that failure to achieve the biodiversity targets is linked to negative socio-economic consequences. At the same time, a number of stakeholders have pointed out adverse socio-economic impacts, in particular economic difficulties as a consequence from nature protection restrictions and requirements that are not (sufficiently) backed by social and economic measures to support good practices (NGOs, associations of fishing enterprises, farmers and foresters across the Member States). The return of some emblematic species has been linked with damage to stock by wolves, or flooding of agricultural land by beaver (farmers associations and regional authorities in Spain, Greece, Italy). However, compensations for damage has reduced tensions between farmers and carnivores for example in Greece. Limitations imposed in implementation of the IAS regulation affects private animal holders, zoos (listed species can be kept until natural death but cannot be bred), animal shelters (danger that the regulation will cause shelters to lack placement options), hunters, and gardeners, as well as horticultural and pet trade businesses. Elimination rather than prevention measures can be in conflict with animal welfare.

[216] ILO (2018) World Employment and Social Outlook 2018: Greening with jobs.
[217] See Annex 8, sub-section 3.2.

1.12. 5.3. Relevance

5.3.1. Strategy relevance to biodiversity and wider needs

Evaluation question 9: *To what extent did the targets of the Strategy correspond to the needs of the EU with regard to biodiversity over the period 2011 to 2020?*

Evaluation question 10: *How relevant was the Strategy for addressing the needs and interests of different stakeholders and for EU citizens?*

Overall response: The Strategy and its targets were widely recognised by experts and stakeholders as being relevant to the EU's needs with respect to biodiversity, as evidenced by the literature review, stakeholder interviews and national case studies. However, the Strategy's targets and actions were not comprehensive in addressing all drivers of biodiversity loss, and they relied on implementation of wider EU policy. The overall needs of the EU with respect to biodiversity have not changed since the Strategy was published. EU citizens, businesses and employees depend on biodiversity and ecosystem services. The socio-economic value of services such as pollination, erosion protection or climate mitigation is increasingly understood. Some issues have grown in prominence, such as the decline of pollinators or the links between biodiversity loss and climate change, but these issues to a large extent still fit with the overall framework provided by the Strategy and its targets to protect and restore biodiversity.

Green infrastructure and nature-based solutions offer opportunities for innovation and sustainable development. The importance of access to nature for physical and mental health has also become more evident during the lockdowns to contain the spread of Covid-19 in the course of 2020 and 2021. Lower income groups tend to be more dependent on ecosystem services, and vulnerable to their loss, especially globally. There is also significant evidence on the links between ecosystem disturbance and destruction, on the one hand, and the risk of emergence of new zoonotic diseases, such as Covid-19, Ebola, avian influenza and Zika. Last but not least, healthy and resilient ecosystems are essential to remove and store carbon away from the atmosphere, and to adapt to the inevitable impacts of climate change.

In summary, the relevance of the Strategy has been upheld and in fact increased with the increasing awareness and recognition of the links between biodiversity, health, food security and climate change, and with the renewed environmental ambition of the European Green Deal.

What is the issue?

Biodiversity is essential to protect and restore for its own intrinsic value, as well as for the range of benefits that support human existence, well-being and prosperity. This section considers the extent to which the 2020 biodiversity targets and related actions corresponded to these needs. (Note: trade-offs and conflicts between biodiversity needs and other objectives are flagged under "cost-effectiveness".)

There is a strong (though not comprehensive) evidence base on biodiversity needs in the EU. The 2010 Biodiversity Baseline[218], as well as the Impact Assessment[219] for the Strategy provided detailed evidence of the status and trends in biodiversity. The Impact Assessment articulated the links between these needs and the Strategy's targets. It also emphasised that halting the loss of biodiversity and ecosystem services is important for EU citizens and the economy, identified a range of different stakeholder groups affected

[218] EEA (2010). EU 2010 biodiversity baseline (European Environment Agency Technical report No 12/2010).
[219] European Commission (2011). Impact Assessment accompanying the EU Biodiversity Strategy to 2020 (SEC/2011/540 final).

by the Strategy, and recognised the important role of different stakeholders, sectors and groups in implementation.

What are the findings?

The Strategy and its targets were widely recognised by experts and stakeholders as being relevant to the EU's needs with respect to biodiversity, as evidenced by the literature review, stakeholder interviews and national case studies. The headline target at the EU level has had a very high political relevance. It describes the ultimate destination of the broad range of efforts, brings together the narrative, sets the common level of political ambition and demonstrates its alignment with, and relevance for, global targets on biodiversity, climate and sustainable development.

However, the six targets and the actions within them were not considered comprehensive. For example, Target 1 was criticised for being focused on European protected areas only (Natura 2000) and not targeting **national protected areas**. Target 2 did not explicitly address all **ecosystem types** and the **range of pressures** relevant to each ecosystem type. Target 3 was focused on the positive contribution of agriculture but not on reducing **key pressures** in agroecosystems, such as pollution with pesticides and fertilisers and land use intensification. Target 4 did not comprehensively address the **range of pressures** in the marine environment which include among others pollution, marine litter, climate change, acidification, underwater noise, and the extraction of mineral resources. Target 5 provided a broad framework for tackling IAS in a coordinated manner at the EU level; however its scope is **limited to species that are included on the Union list**, and it does not comprehensively cover all **paths of introduction**. Target 6, while fully relevant to the main area of EU action for global biodiversity, remained at a very **general level** in the definition of the actions.

The EU ecosystem assessment provided evidence of a **growing societal demand for key ecosystem services** that depend on healthy ecosystems. However, many of these services are stable or declining, resulting in a deficit. Lower income groups tend to be more dependent on ecosystem services, and vulnerable to their loss, especially globally. The **socio-economic value** of services such as pollination, erosion protection or climate mitigation is increasingly understood, and the EU Green infrastructure strategy has highlighted the role of **innovative nature-based solutions** for tackling a range of societal challenges. The importance of access to nature for **physical and mental health** has become ever more evident during the lockdowns to contain the spread of Covid-19 in the course of 2020 and 2021. Tackling ecosystem degradation and illegal wildlife trade is necessary to **curb the risk of emergence of new zoonotic diseases** with the potential to result in a catastrophic outbreak of pandemic proportions as seen with influenza in the past, and SARS-CoV2 today, further considering herein that around three quarter of new infectious diseases globally result from direct animal-human interactions. Last but not least, healthy and resilient ecosystems are essential to remove and store carbon away from the atmosphere, and to adapt to the inevitable impacts of **climate change**. There is strong evidence that the protection of natural capital is essential for prosperity and socio-economic development[220] and growing recognition of this interdependence. However, despite this growing recognition, awareness of the contribution of biodiversity to meeting socio-economic development demands needs to be further increased, and the knowledge

[220] Global Assessment Report on Biodiversity and Ecosystem Services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES, 2019), SOER 2020, Dasgupta Review.

accumulated on the value of ecosystems and their services needs to be further systematically integrated into policy and investment decisions[221].

Box 2. Links between biodiversity, climate and food security
(highlights from the EU Biodiversity Strategy for 2030)

"The biodiversity crisis and the climate crisis are intrinsically linked. Climate change accelerates the destruction of the natural world through droughts, flooding and wildfires, while the loss and unsustainable use of nature are in turn key drivers of climate change. But just as the crises are linked, so are the solutions. Nature regulates the climate, and nature-based solutions, such as protecting and restoring wetlands, peatlands and coastal ecosystems, or sustainably managing marine areas, forests, grasslands and agricultural soils, will be essential for emission reduction and climate adaptation. Planting trees and deploying green infrastructure will help us to cool urban areas and mitigate the impact of natural disasters.

"Biodiversity loss and ecosystem collapse are one of the biggest threats facing humanity in the next decade. They also threaten the foundations of our economy and the costs of inaction are high and are anticipated to increase. The world lost an estimated EUR 3.5-18.5 trillion per year in ecosystem services from 1997 to 2011 owing to land-cover change, and an estimated EUR 5.5-10.5 trillion per year from land degradation. Specifically, biodiversity loss results in reduced crop yields and fish catches, increased economic losses from flooding and other disasters, and the loss of potential new sources of medicine.

"Biodiversity loss threatens our food systems, putting our food security and nutrition at risk. […]. For instance, more than 75% of global food crop types rely on animal pollination.

This recognition of these links is reflected in the renewed environmental ambition of the European Green Deal which provided a mandate for strengthened EU action on biodiversity, in a holistic framework that also tackles food security, health and climate change issues, and in the EU Biodiversity Strategy for 2030.

Stakeholder views

The OPC survey responses as well as the EU and national stakeholder interviews carried out in the context of this evaluation, revealed broad agreement that the Strategy and its targets were overall relevant to biodiversity needs in the EU. Stakeholders and authorities indicated issues that could have been given greater prominence such as links with ***climate change****;* ***cultural heritage and landscapes****; the* ***role of sectors*** *other than agriculture, forestry and fisheries; further pressures on biodiversity; as well as actions to tackle* ***consumer demand*** *and encourage g****reen investments****. The Strategy and its targets were criticised by environment organisations as insufficiently ambitious, due to their non-binding nature and inability to address wider challenges identified at the time of the Strategy. Stakeholder consultations revealed criticism of* ***insufficient emphasis given to some ecosystems*** *(e.g. freshwater) in the Strategy, while targets deal explicitly with agriculture and forest ecosystems*[222]*.*

[221] Guidance on integrating ecosystems and their services into decision-making (SWD(2019) 305 final) and Summary for Policymakers in Government and Industry.
[222] European Habitats Forum (2019) position paper The implementation of the EU 2020 Biodiversity Strategy and recommendations for the post 2020 Biodiversity Strategy; AlterNet & EKLIPSE (2019) Key messages ALTER-NET & EKLIPSE conference The EU Biodiversity Strategy Beyond 2020.

Consultation submissions by stakeholder groups representing farming, forestry, fisheries and industry (e.g. public consultation to support the Strategy, consultation on evaluation roadmap, consultations relevant to specific targets such as the Nature Directives' fitness check) suggested that they saw themselves as partners in delivering the Strategy and relevant targets. Interviews with EU and national stakeholders confirmed the relevance of the Strategy to a range of stakeholder needs. However, some groups representing farming, forestry, fishing and business interests felt they had not been properly engaged, their efforts had not been fully recognised, and that the Strategy had taken too little account of business needs alongside those of biodiversity.

The highest rated aspect of the Strategy's governance was ensuring the contribution of research and knowledge to the implementation and monitoring of biodiversity targets, public access to information on the state of biodiversity and on the key drivers of biodiversity loss in the EU, regular progress review and strengthening of efforts and accountability. The framework was deemed to have worked the least well in coordinating efforts at all levels (sub-national, national, EU and global).

A high share of respondents (73%) considered that the Strategy's monitoring framework was fully or partially adequate to track progress towards Target 1. The performance of the monitoring framework in relation to Target 4 and Target 6 was assessed rather poorly. *Key drawbacks noted by stakeholders in open text included the lack of systematic, comprehensive monitoring frameworks (EU citizens, NGOS), the lack of standardised monitoring approaches and general lack of information disseminated between relevant actors.*

5.3.2. Flexibility to adapt to emerging issues

Evaluation question 11: "Has the Strategy been flexible enough to respond to new or emerging issues?"

Overall response: The main challenges affecting biodiversity for the EU remain as they were when the Strategy was published. These challenges have yet to be adequately addressed. While the strategy framework has been broad enough to cover the range of biodiversity needs, some issues have risen in prominence since 2011. Following the mid-term review of the Strategy in 2015, and the calls made in the subsequent Council Conclusions and EP resolution, a number of these emerging issues were reflected in the EU Roadmap for enhanced implementation of the EU Biodiversity Strategy to 2020. In addition, the 2016 fitness check of the EU Nature Directives revealed gaps in implementation and enforcement. To address these weaknesses, the Commission adopted and implemented a comprehensive Action plan for nature, people and the economy (2017-2019). Thus, there has been significant flexibility to adapt and take into account issues that have emerged in the course of the Strategy's implementation and assessment.

What is the issue?

The Strategy was designed to address the biodiversity needs and issues as defined in 2011. This part explores (1) whether new needs arose (or became more prominent) during the decade of its implementation and (2) whether the Strategy's design allowed it to adequately respond to such issues.

What are the findings?

The main challenges affecting biodiversity in the EU remain as they were when the Strategy was published (and have yet to be adequately addressed). While the Strategy framework of targets was formulated in a broad enough way to cover the range of

biodiversity needs, some specific issues have become apparent or risen in prominence since 2011. These include, for example, the decline of pollinators, the links between biodiversity and climate change, biodiversity and health, as well as technological developments with potentially major impacts on biodiversity, such as deep sea mining for rare minerals or synthetic biology.

The Strategy's broad scope was determined by the headline target to address the decline of biodiversity and ecosystems. While the six operational targets focused on priorities and guided actions and resources, they did not preclude additional actions, as evidenced by new actions that have taken place since 2011. The mid-term review in 2015 provided an opportunity to tackle issues of increased importance, some of which were reflected in the Roadmap for enhanced implementation of the Strategy agreed with the Member States and stakeholders in 2016. For example, a new EU pollinators initiative was published in 2018 that laid out strategic objectives and actions to address the decline in pollinators in the EU and to contribute to global conservation efforts. It can be therefore concluded that the Strategy provided a framework that was broad and flexible enough to adapt to new or emerging needs for biodiversity.

Views of stakeholders

Overall, respondents across the Member States considered the Strategy relevant to biodiversity needs. However, biodiversity needs themselves have often remained low in the ranking of priorities for policy and investment decisions (inputs to targeted survey from research entities, regional authorities, NGOs). The evaluation suggests that a range of factors exist that affect ownership at different levels and for different types of stakeholders, including insufficient awareness of the value of biodiversity and underestimation of the socio-economic consequences of biodiversity loss at all levels, from the national programming of EU funds and other policy, planning and investment decisions through to local uptake of biodiversity measures. The consultations have also revealed mixed appreciation by stakeholders of their engagement in the design and implementation of biodiversity measures, which is likely to have affected their feeling of ownership of the policy. Stakeholders in the agriculture, forestry and fisheries sectors have often referred to unresolved conflicting land and sea use interests and to insufficient support, compensation or incentives for biodiversity measures. The choice of policy instrument has also meant that some stakeholders may not have felt concerned by an obligation to deliver.

Two-thirds of respondents to the OPC assessed the EU Biodiversity Strategy to 2020 as having fully or partially responded to the main biodiversity needs and issues in the EU. A number of stakeholders added an open statement that further integration and coordination is needed with agriculture (42%), land use (21%) and energy (21%) policies. Far from being inflexible, the Strategy was criticised by environmental NGOs and experts for being too broad and lacking specificity and precisely defined obligations. Areas considered by different stakeholders to need stronger emphasis include: adapting to the impacts of climate change on ecosystems and species, the promotion of good practices (in farming, forestry, sustainable fishing), more focus on vulnerable ecosystems (e.g. coastal, freshwater) and on pressures from sectors such as renewable energy, more attention to traditional management systems, improvement of biodiversity governance at all levels, education and youth involvement, fair distribution of the costs and benefits of biodiversity conservation and green taxation. (Survey inputs from forest, agroecology, farmers and ranchers associations, regional authorities and environmental NGOs).

1.13. 5.4. Coherence

5.4.1. Coherence with EU environmental and other policies

Evaluation question 12: *To what extent was the Strategy coherent with the Europe 2020 Strategy for smart, sustainable and inclusive growth?*

Evaluation question 13: *To what extent did the Strategy support other EU environmental policy objectives, for example, in relation to clean air and water, the marine environment, the transition to a circular economy, sustainable production and consumption, soil protection, sustainable land use and management, waste management, and the sustainable use of resources? What are the synergies or overlaps?*

Evaluation question 14: *To what extent are the biodiversity targets coherent with and mainstreamed into other EU policies, in particular on agriculture, forestry, fisheries, regional and urban development, infrastructure (in particular transport, energy and environmental infrastructure, ports, and mining), tourism, climate mitigation and adaptation, research and innovation as well as trade and development cooperation?*

Overall response: The EU Biodiversity Strategy 2020 targets had the potential to contribute in many ways to the 2020 Strategy for sustainable growth and wider EU policies for the environment and other key areas. While cross-references are found in most policy documents, they do not always make explicit how these synergies would be realised or what measures would be taken to mitigate conflicts and trade-offs. Overall, the EU Biodiversity Strategy and other environmental objectives were closely linked and mutually supportive. Failures to make sufficient progress on other EU environmental policy objectives, for example on air quality, ecological status of water and marine ecosystems, the reduction of pollution and waste or environmental crime caused significant pressures on biodiversity and hindered the achievement of the EU Biodiversity Strategy headline target.

What is the issue?

Halting and reversing biodiversity is a cross-cutting issue addressing which requires that (1) synergies between sector policies and the Strategy are recognised and promoted; and (2) potential conflicts or negative impacts are identified and addressed. This part of the evaluation assessed the extent to which the Strategy did not contradict other interventions with similar or different objectives at the EU and national levels (=either neutral or complementary); the extent to which other policies included safeguards to prevent negative impacts on the achievement of the Strategy's objectives (=safeguarded or proofed); and the extent to which the Strategy incorporated aspects of other strategic objectives, and created synergies (= mainstreamed).

What are the findings?

There is good evidence to assess the potential for synergies with the 2020 Strategy and EU environmental policies, but less evidence on the Strategy's concrete contribution to sustainable growth, in particular in view of its limited implementation and in the absence of a system to monitor or report such impacts. Examples provided by stakeholders in the context of the case studies in the Member States were used to complement the assessment of coherence by illustrating synergies as well as policy conflicts.

In relation to coherence with the Europe 2020 Strategy for smart, sustainable and inclusive growth: The two strategies referred to each other but they did not make explicit how the joint priorities could be realised, and therefore did not provide sufficient incentives for synergies. The Europe 2020 Strategy included few policy drivers on biodiversity, and the flagship policies did not mainstream biodiversity. Although the EU

Biodiversity Strategy to 2020 identified several needs that are clearly related to the flagship initiatives, including biodiversity-related skills and jobs, digital infrastructure and tools, innovation, and trade agreements, these were not reflected in the priorities set by the flagship initiatives. In practice, the policy instruments and funding streams of the Europe 2020 strategy were used in some ways to advance biodiversity objectives. The headline indicators presented in the 2019 edition of the Indicators to support the Europe 2020 Strategy[223] made no reference to biodiversity, ecosystem services, or resource efficiency.

The Biodiversity Strategy targets depended on the implementation of **EU environmental legislation** and **legislation in other policy areas**. Failure to implement, enforce, and monitor the environmental legislation fully has been a significant factor in the failure to fully achieve the Biodiversity Strategy targets. It is more difficult to draw conclusions with respect to how much the EU Biodiversity Strategy contributed to achieving these environmental objectives, because of the evidence gap with respect to the amount of ecosystem restoration undertaken as a result from the Strategy, and the outcomes of further actions such as on sustainable consumption or harmful subsidies.

In relation to coherence with **other EU policies,** the evidence gap is moderate. The evidence base on the other policy objectives and implementation is good. Evidence of biodiversity mainstreaming in the implementation of EU policies, and situations of policy incoherence, are specific to national or local contexts and sectors, and are drawn from the national case studies and examples. There has been progress on mainstreaming at the level of policy objectives and instruments at the EU level, including better biodiversity proofing of EU funds, but gaps remain at the implementation level where many of the key decisions are made at the Member State level or at regional levels of governance, and uptake varies significantly. Cases of incoherence have been identified between EU policy-driven and funded projects for economic sectors, and the conservation of biodiversity, ecosystem services, and ecosystem restoration.

The EU Biodiversity Strategy included targets and actions **directly aimed at biodiversity mainstreaming in the EU policies on agriculture, forestry, and fisheries,** and the coherence of these policies with the biodiversity objective has improved since 2011. The evaluation indicates that integration with sectoral policies has been the strongest at the level of broad policy objectives; that biodiversity-proofing has been insufficient resulting in support measures that still encourage unsustainable land and sea use practices; that biodiversity support measures in other policies have remained optional and uptake has often been insufficient, or that preference has been given to measures with low biodiversity benefit. Nature-based solutions that provide benefits for biodiversity as well as solutions to wider environmental and socio-economic challenges have not been taken up sufficiently.

Some aspects of implementation have improved, but there are still elements of incoherence and even conflicts, as well as a failure to use measures to their fullest potential to create synergies (including inadequate funding and reach of measures). All three sectors have significant pressures on biodiversity[224], but they have a key role to play in moving towards sustainable use that is compatible with biodiversity conservation.

- **The Common Agricultural Policy (CAP)** is coherent with the EU Biodiversity Strategy 2020 at the level of policy objectives and instruments, with evidence that biodiversity has been mainstreamed to a certain extent in the policy instruments

[223] Smarter, greener, more inclusive? Indicators to support the Europe 2020 strategy.
[224] As described in this report's section on Effectiveness. In the marine realm, although there has been improvement in commercial fish stocks towards MSY, other protected species groups are declining.

addressed by the Strategy. However, the absence of a strategic framework which required Member States to give greater priority to biodiversity has left them able to prioritise other objectives and measures. Failures to maximise synergies were mostly related to national implementation choices and inadequate uptake of the most effective options for biodiversity, failure of CAP planning process to adequately identify the needs for biodiversity[225], and failure to allocate sufficient funding to meet needs of biodiversity conservation in agriculture[226]. Examples of positive coherence with the CAP include targeted agri-environment-climate measures (AECM) with benefits for biodiversity. CAP forest measures were generally coherent but with very limited scope, and Member States have programmed the measures for biodiversity objectives mainly through targeted investments addressing also improved resilience. The evaluation of the impacts of the CAP on biodiversity, soil and water concluded that, had Member States made different implementation choices and had they always used the most effective and efficient measures, the CAP could be delivering greater synergies with the EU's biodiversity strategy to 2020 - and the implementation of the Birds and Habitats Directives.

- The **Common Fisheries Policy (CFP) reform in 2013** increased coherence of the policy with the Biodiversity Strategy by applying the ecosystem-based approach that aims to ensure that negative impacts of fishing activities are minimised, and that aquaculture and fisheries avoid degradation of the marine environment. The CFP also included measures specifically contributing to Good Environmental Status (GES) under the MSFD and a toolbox of measures contributing to biodiversity conservation, as well as the regulation of fishing activities and their impact on the marine environment. However, the review of the implementation of the Marine Strategy Framework Directive[227] identified as one of the critical areas for improvement coherence in the operational objectives of key EU policies (such as the common fisheries policy and the common agricultural policy). It pointed to the need for sectors such as fisheries, energy, transport, agriculture and climate to further integrate measures for the achievement of GES of marine ecosystems. Data from the Member States to assess the impacts of EU fisheries on marine ecosystems in the EU and non-EU waters (e.g. incidental by-catch of all birds, mammals and reptiles and fish protected under Union legislation and international agreements) is not systematically reaching the MSFD assessments and reporting.

- **Economic development sectors (transport, energy (including renewable energy), mining, tourism and EU funding for regional and urban development:** In general, the EU Biodiversity Strategy did not include targets and actions directly aimed at these sectors but it did programme actions to improve Natura 2000 protection and governance in relation to them (such as guidance documents, training for judges and public prosecutors, green infrastructure planning, improved methods for assessing impact of EU funded projects, plans and programmes on biodiversity). The EU Bioeconomy Strategy sets out a framework for improving our understanding of environmental boundaries of the EU bioeconomy and for addressing its pressures on ecosystems.

  One of the investment priorities of the **ERDF** and **Cohesion Fund** (2014-20) was "protecting and restoring biodiversity and soil and promoting ecosystem services,

[225] Ecorys, IEEP and WUR (2016) Mapping and analysis of the implementation of the CAP. Final Report.
[226] N2K Group (2016) Integration of Natura 2000 and biodiversity into EU funding (EAFRD, ERDF, CF, ESF): Analysis of a selection of programmes approved for 2014-20, Brussels: The N2K Group.
[227] Review of the implementation of the MSFD (COM/2020/259 final).

including through Natura 2000, and green infrastructure"[228]. Nineteen Member States (EU-28 including the UK) programmed Cohesion Policy funds under this priority.

As some of the above sectors receive significant EU funding, the biodiversity proofing of EU funding was also an important relevant action. However, the methodology for biodiversity proofing was not consistently applied at the national level. Many sectoral policies continue to drive biodiversity decline rather than incentivising synergies, and examples of policy incoherence were found in the case studies[229].

Strengthened biodiversity proofing will help to strengthen the connection between biodiversity policies and sectoral ones (both at the EU and Member State levels) for example, in line with the Do No Significant Harm principle. Awareness needs to be built of nature-based solutions to a range of societal changes - such as ecosystem restoration for long-term carbon storage, water purification and regulation by healthy ecosystems, local climate adaptation, soil improvement and integrated pest control. Resolving potential trade-offs while building on potential synergies between biodiversity and other policy objectives requires transparent dialogue, input from science and a long-term, holistic approach. Moreover, systematic application of the Energy Efficiency First principle across all sectors, and notably in energy and water, can bring significant cross-sectoral benefits and indirectly help to reduce pressures on biodiversity.

Views of stakeholders

The OPC responses to the question on the contribution of the EU Biodiversity Strategy to the objectives of other EU policies revealed very mixed views. The strongest positive responses were given for coherence with the policy areas of climate action, the CAP, energy policy, the forest strategy, regional policy, and water policy. There were stronger positive responses in relation to contributions of the Strategy to the air quality and climate action objectives. This may be influenced by the large proportion of responses received from the Polish forestry sector, as these are environmental objectives widely associated with forests. The targeted consultations in the Member States provided numerous examples of policy coherence as well as incoherent policy instruments at the national and regional levels[230].

5.4.2. Coherence with EU global commitments on biodiversity, climate, Sustainable Development

Evaluation question 15: *To what extent is the Strategy aligned with the EU's international commitments under the Convention on Biological Diversity, the Sustainable Development Goals, and the United Nations Framework on Climate Change?*

Overall response: the Strategy has been designed to implement the EU's international commitments under the CBD, and it is largely coherent with the SDGs and the UNFCC.

What is the issue?

The EU policy framework for biodiversity, which also implement the EU's commitments under the Convention on Biodiversity, needs to ensure links with sustainable

[228] Article 5(6)(d) of Regulation 1301/2013 on the ERDF and Article 4(c)(iii) of Regulation 1300/2013 on the Cohesion Fund.
[229] Trinomics B.V. (2021) Support to the evaluation of the EU Biodiversity Strategy to 2020. Final study report, Appendix C.
[230] See Annex 8, section 4.

development and climate objectives, in line with global efforts to strengthen links between the global frameworks on biodiversity, sustainable development and climate.

What are the findings?

The EU Biodiversity Strategy was designed to implement the EU's commitments under the Convention on Biological Diversity. The 2020 Aichi biodiversity targets, set to guide global biodiversity efforts in the period 2011-2020, were integrated across the different EU targets and actions. The 5th and 6th National Reports to the CBD provide analysis of progress by the EU and the Member States towards the Aichi targets.

The Strategy is also generally in line with the ***2030 Agenda for Sustainable Development.*** The most relevant SDGs to the Strategy's targets and actions are SDG 14 and SDG 15 on life under water and on land, as well as SDG 12 and SDG 13. While the Strategy directly relates to only a minority of the 17 SDGs, the SDGs themselves are interconnected. Natural capital is at the foundation of societal wellbeing and prosperity, and the achievement of the SDGs in relation to water, climate and life on land and underwater is a precondition for the achievement of all other SDGs. A more integrated, coherent approach to support biodiversity and sustainable development in EU external action could have brought even more synergies and benefits.

The Strategy makes numerous references to the ***links between biodiversity and climate action***, recognising both the importance of mitigating climate change in efforts to halt biodiversity loss, and the role of ecosystems in climate change mitigation and adaptation. It states that the EU will promote enhanced cooperation between the CBD, Climate Change and Desertification Conventions to yield mutual benefits. Synergies are identified with respect to Target 2 (ecosystem restoration) and 3b (forest management) but are also relevant to other targets (including 1, 3a and 6). Coherence with climate change policy is discussed in the answer to evaluation questions 12 and 13. Overall, the Strategy is coherent with international climate commitments, but it is less clear how potential synergies are being maximised.

1.14. 5.5. EU Added Value

Evaluation question 16: *What is the added value resulting from the EU Biodiversity Strategy compared to what is likely to have been achieved by the Member States in its absence?*

Evaluation question 17: *How do Member States' targets add up or compare to the targets at EU level?*

Overall response: The structure of the Strategy provided a framework for coordinated and coherent action on biodiversity and its targets likely boosted biodiversity ambition for many Member States. This created an added value at EU level, however the value was lower than it would have been with stronger governance arrangements and financing instruments, driving greater implementation.

What is the issue?

The purpose of the Strategy builds upon several components of potential EU added value, including setting a high level of ambition for biodiversity across the EU and a common framework for action, providing additional and innovative interventions at the EU level; transboundary features of biodiversity (no aspects of biodiversity inherently coincide with national borders); information sharing between EU Member States;

coordinated action; policy coherence at EU level; governance and enforcement through infringement procedures and financing through the allocation of additional resources at Member State and EU level.

What are the findings?

There is clear evidence of **new and innovative outputs** from the Strategy's implementation, but little evidence of their impact. A large array of specific outcomes have occurred as a direct result of the Strategy, such as the IAS Regulation, and tools for strengthened biogeographical regional cooperation, monitoring and reporting systems in support of the implementation of the Nature Directives. Action 5 of the Strategy produced a methodological framework for the Mapping and Assessment of Ecosystem Services. Target 2 raised the profile of green infrastructure in the EU including the development of a green infrastructure strategy, among other initiatives. Across Targets, most progress that is clearly attributable to the Strategy relates to establishing strategic EU level policy frameworks, coordination of implementation, communication and information sharing, and new tools and measures designed to increase the knowledge base to inform decision-making. These are significant and valuable developments.

Attribution of the Strategy's outcomes in support of the Nature Directives Natura 2000 can only be made for additional action that the Strategy inspired, for which evidence was limited in literature and not highlighted in consultation. One area of additional outcome is related to communications, fostering cooperation and providing training for judges and public prosecutors in relation to the Natura 2000 network, which have increased awareness of Natura 2000, supported enforcement and informed decision-making.

Several examples of ***transboundary cooperation*** exist that have links to the Strategy, such as support for biogeographical cooperation, guidance for strategic EU level Green and Blue infrastructure, coordinated action at the EU level to tackle the threat if invasive alien species, links with global commitments under the Convention on Biological Diversity, as well as cooperation with the Council of Europe to tackle illegal trapping, killing and trade of birds. However, the European Court of Auditors 2017 report into the Natura 2000 network noted insufficient structures in place to ensure cross-border cooperation and in particular habitat connectivity of the Natura 2000 network[231]. Also, despite much discussion and work in relation to green infrastructure, some stakeholders in EU-level organisations noted the insufficient EU investment in green infrastructure.

Many working groups and events have been convened to provide ***knowledge sharing between Member States***, and can be attributed to the Strategy and its Common Implementation Framework. For example, through the IAS Regulation, networks such as EASIN have increased knowledge-sharing and cooperation between stakeholders, encouraging coordinated action between countries which share invasive alien species, and facilitated harmonised monitoring of invasive alien species throughout Europe[232,233], and leading to increased citizen involvement[234]. The EU MAES initiative has brought national experts, the research community and stakeholders together to work on improving the knowledge base on ecosystems and their services and to help integrate ecosystem-based approaches in other EU policy areas.

[231] ECA (2017). More efforts needed to implement the Natura 2000 network to its full potential (European Court of Auditors Special Report No 1/2017)

[232] Magliozzi (2020) Assessing invasive alien species in European catchments: Distribution and impacts. *Science of the Total Environment, 732*.

[233] Tsiamis K et al. (2017); Pergl et al. (2020); Tsiamis et al. (2017, 2019, 2021), Cardoso et al. (2021).

[234] https://easin.jrc.ec.europa.eu/easin/CitizenScience/BecomeACitizen

Evidence suggests that ***funding decisions related to the Strategy*** have facilitated the implementation of biodiversity projects and initiatives. Such linkages could have been further strengthened, for example if Restoration Prioritisation Frameworks had been developed by all Member States under Target 2. A clear understanding of biodiversity-related expenditure from EU and Member State sources is a key challenge being addressed in ongoing efforts by the Commission, while challenges in attribution of outcomes to the Strategy is a recurrent theme in this analysis.

The structure of the Strategy as an instrument, including a lack of reporting obligations or of legal consequence if Member States failed to deliver on outcomes, is likely to have impeded the added value that it might have produced.

Views of stakeholders

Targeted consultations of stakeholders in most Member State case studies identified support for the Strategy in influencing the ambition of national implementation through leadership and frameworks, and in providing a transboundary dimension, although stakeholder views on the added value of the Strategy were mixed. A number of Member States had no biodiversity-related strategy nor targets in place prior to the EU Strategy, and biodiversity knowledge was insufficient. In these Member States, the Strategy has been seen to have raised the ambition of national biodiversity objectives, helped to set deadlines for their achievement, as well as to attract funding for biodiversity from EU instruments, and to generate investments in large biodiversity projects. It has also encouraged a more coherent approach and cross-border cooperation on biodiversity in the EU. (Environmental NGOs, association of farmers and ranchers, regional authorities, association of fishing enterprises,). The added value of the EU Strategy was seen as lower by respondents in the context of countries which already had a comprehensive biodiversity strategy in place, such as Germany (public authorities), but it was recognised that the Strategy was useful to keep the topic on the national agenda and to push for delivery. Some experts have questioned the added value of Target 1 in comparison to what would have happened in implementation of the Nature Directives.

The Strategy is seen as adding value in integrating biodiversity objectives in different sectors, however, biodiversity conservation is still considered as a separate policy area (regional authorities, environmental NGOs, sector forest associations). The added value of the Strategy has been further reduced by its ambiguity on some targets and by governance weaknesses, in particular gaps in defining the responsibilities for implementation (Environmental authorities, research organisations, NGOs in Spain, Italy, Greece, Germany, Lithuania, Bulgaria). Some stakeholders considered that the Strategy did not provide for sound implementation instruments, and that better results would have been achieved in the agricultural, forestry and aquaculture sectors by providing more dedicated funding from EU instruments to compensate and incentivise biodiversity measures (farmers, fisheries, forestry associations); or by setting the biodiversity targets and measures directly in other policy instruments (regional authorities).

It is notable that while fairly evenly split, the majority of respondents to the OPC thought that cooperation and learning with third countries and Member States was achieved poorly or not at all through the Strategy. There was prevalence in the opinion that the Strategy had provided a good overarching framework for intervention in relation to biodiversity, with (as one example) an interviewee from an international organisation arguing that through the Strategy, Member States knew where to focus to address the main drivers of biodiversity loss. Feedback from consultation supports the idea that governance mechanisms associated with the Strategy were weak and that the lack of

progress in delivering on outcomes reflect insufficient budget allocated to implementation. These themes were frequently raised in case study development and through interviews with EU organisation representatives.

A greater proportion of respondents to the OPC stated across all Targets that funding 'poorly' supported the implementation of the Strategy. Case studies undertaken as part of the stakeholder consultations on the evaluation identified strong stakeholder support for a specific financing instrument to reduce conflicts in the destination of economic resources and strengthened the effectiveness of the Strategy[235]*, a finding also made in other studies*[236].

Quotes from the consultations:

"The moment the BDS was there, it started to influence action. Not to say there are no improvements necessary, but there is no region in the world with a similar level integrated strategy that links to sectoral strategies, like it." (EU level NGO.)

"I think the governance mechanisms for ensuring the targets were being met were lacking. […]there was no dedicated budget. There was a very slow implementation by Member States, and there were no requirements specifically on Member States to spend money on managing besides achieving the conservation objectives. There was a long discussion about green infrastructure which did not result in investing in strategic and connected physical restored network of biodiversity areas." (EU level NGO.)

[235] See Annex 8.

[236] Kettunen et al. (2017) Integration approach to EU biodiversity financing: evaluation of results and analysis of options for the future. Final report. (IEEP 2017).

6. 6. CONCLUSIONS

1.15. 6.1. Findings

6.1.1. Effectiveness

Overall, the EU has fallen short of achieving the headline target to halt and reverse biodiversity loss in the EU, and to contribute to averting global biodiversity loss. Biodiversity and the benefits it provides have continued to degrade in the EU and globally. Insufficient progress has been made to all but one of the six operational targets. While a number of actions have been fully or almost fully implemented, many of them concerned the development of policy and strategic frameworks and knowledge. Others, in particular those involving the implementation of conservation and restoration measures on the ground, or tackling key drivers of biodiversity loss, have lagged behind.

Positive achievements associated with the implementation of the Strategy include:

(i) some local biodiversity improvements on the ground as a result of protection and restoration actions, and a significant increase of species assessments under the Habitats Directive showing favourable conservation status or improving trends;

(ii) progress in the designation of Natura 2000 areas and increased transboundary cooperation between authorities and stakeholders;

(iii) improved knowledge on ecosystems and their services;

(iv) green infrastructure developed at the local and regional levels in many Member States, providing cost-effective nature-based solutions for disaster risk reduction, health and recreation, and other benefits, while also improving ecological connectivity and biodiversity habitats;

(iv) inclusion of biodiversity objectives and biodiversity support measures in EU programmes for agriculture, fisheries, regional development and research and innovation, and increased access to EU funding for biodiversity in the Member States;

(v) new EU legislation on invasive alien species as a basis for coordinated actions across the Member States to prevent and control invasions;

(vi) increased EU and Member States' financial contributions to global biodiversity, and examples of integrated approaches in external action promoting biodiversity and sustainable development;

(vii) strengthened partnerships such as the EU Business@Biodiversity platform;

(viii) significant improvements in the knowledge base via the mapping and assessment of ecosystems and their services, strengthened biodiversity monitoring and Member States' initiatives to involve stakeholders in knowledge development.

Factors that have influenced effectiveness:

- ***The level of political priority given*** to biodiversity protection and restoration, especially vis-à-vis other policy objectives and in the context of budgetary constraints and competing demands, has had a major impact on the implementation of the Strategy at all levels. This, in turn, has been influenced by understanding of the importance of biodiversity and of the synergies between biodiversity protection and restoration, on the one hand, and wider environmental and socio-economic objectives on the other.

- ***Effective mainstreaming of biodiversity objectives and support measures in key policy areas*** has been of major importance for tackling key drivers of biodiversity loss. Insufficient integration has been cited by actors across the board, often in relation to conflicting objectives and measures that encourage practices harmful to biodiversity, and to biodiversity measures of low or no positive biodiversity impact favoured in the programming of EU funds.
- The ***choice of instrument*** has played an important role. Legal requirements, for example those set by the Nature Directives, have helped to ensure enforceability of the Strategy's targets and measures. Clear definition of nature and biodiversity financing needs, for example in the national Prioritisation Action Frameworks, have helped the integration of biodiversity support measures in the programming of EU funding instruments in a number of Member States. Conversely, biodiversity targets of voluntary nature were not systematically prioritised for support in the design and implementation of EU funding instruments. Vaguely formulated targets without commonly agreed definitions, for example on restoring 15% of degraded ecosystems, or on eliminating harmful subsidies, presented an obstacle to coherent strategic implementation by Member States. There were few mechanisms to track progress or ensure the implementation of those targets that were largely voluntary.
- Tackling the ***drivers of biodiversity loss*** is essential to reverse the negative trends. There were no clearly set actions to address the indirect drivers of loss as well as key direct pressures such as land use change, pollution or unsustainable maritime activities beyond overfishing.
- ***Adequate financial and human resources for implementation and enforcement of biodiversity policy and legislation.*** For example, it has been estimated that, as of 2011, almost EUR 6 billion / year were necessary only for the direct management costs of the Natura 2000 network, while an assessment of the PAFs indicates that total spending (beyond direct management of Natura 2000) has been in the range of EUR 25.5 billion in the period 2014-2020, i.e. significantly below the estimated needs. Insufficient administrative capacities, combined with difficulties for some stakeholders to access support for conservation and restoration measures, have been cited by interviewees across the board as major obstacles for implementation.
- ***Transparency, cooperation and dialogue*** between authorities and stakeholders across policy areas to exchange experience, raise awareness on biodiversity, identify common issues, including potential conflicting objectives, develop common solutions for biodiversity and ensure acceptance, ownership and engagement in implementation among actors in other policy areas and economic sectors, as well as support among EU citizens.
- ***Knowledge and capacity*** to support the monitoring of progress, the design and implementation of biodiversity conservation and restoration measures, and the deployment of nature-based solutions that benefit biodiversity, climate change mitigation and adaptation, and wider socio-economic objectives. Cooperation and dialogue between policy-makers and science and research stakeholders is essential for evidence-based policy-making.

6.1.2. Efficiency

Overall, the Strategy had the potential to give rise to economic benefits far exceeding the costs incurred from the full implementation of its targets and actions (both in terms of

conservation spending and administrative and opportunity costs). Implementation has supported the creation of economic value, employment and quality of life linked to ecosystem services and the preservation of natural capital. However, the full potential of such benefits has not been realised, due to limited implementation.

Factors that have influenced efficiency:

- ***Knowledge*** on biodiversity, ecosystem services and nature-based solutions has enabled the development of higher-impact conservation measures as well as integrated solutions providing a wider range of benefits (such as urban greening measures that create biodiversity habitat, help climate adaptation, reduce flood risk and provide recreation opportunities). Remaining gaps in knowledge especially in relation to certain ecosystem types (such as marine ecosystems) and ecosystem services (such as their dependency on ecosystem health) are making it more difficult to design well-targeted biodiversity measures.
- ***Stakeholder engagement*** has helped to identify and minimise potential negative impacts of conservation measures on specific stakeholders (for example due to opportunity costs). Partnerships and cooperation mechanisms have also supported experience exchange and learning from good examples. Mechanisms to minimise socio-economic impacts of biodiversity measures and develop alternative sustainable use solutions for affected economic stakeholders.
- ***Investment in prevention and early intervention*** to tackle pressures on biodiversity has increased the effectiveness of spending, for example in the case of invasive alien species (as controlling established invasions can be very costly and less effective).
- ***Coherence of biodiversity and other policy objectives*** and measures: support for economic activities that damage biodiversity, for example such that result in land use intensification and the over-extraction of natural resources, have reduced the impact of biodiversity conservation actions. Increasing coherence with internal EU policies can further reinforce EU external action to curb global biodiversity loss.
- ***Access to well-targeted funding*** is a major driver of delivery of biodiversity benefits. Since funding was generally insufficient for protection and restoration, or in some cases it was not well-targeted (e.g. support for measures with low positive impact on biodiversity), or it entailed major administrative burden and risk compared with support for alternative management practices, many of these benefits were not realised. Comprehensive and transparent monitoring of biodiversity expenditures across all key policy areas is also needed to keep track of implementation and of impacts on biodiversity and ecosystem services
- ***Clear and predictable policy framework, and a fair playing field for stakeholders.*** The efficiency of measures has been hampered by uneven implementation, different rules and interpretation (linked also to flexibility for choices at the national level) and in some cases, low predictability of biodiversity measures arising from the non-binding nature of the Strategy's targets.
- Insufficient implementation has hampered the achievement of the full potential of the Strategy to deliver a range of socio-economic and environmental benefits from healthy ecosystems.

6.1.3. Relevance

The Strategy was underpinned by strong evidence on the decline of biodiversity and ecosystem services, and its targets are widely recognised by experts and stakeholders as relevant to the EU's needs with respect to biodiversity. However, the Strategy's targets and actions were not comprehensive in addressing all drivers of biodiversity loss, such as

land use intensification in agriculture, or pressures on marine ecosystems arising from other economic activities beside fisheries.

The overall needs of the EU with respect to biodiversity have not changed since the Strategy was published. Some issues have grown in prominence, such as the decline of pollinators, the links between biodiversity loss and climate change, and between biodiversity and health. These issues to a large extent fit with the overall framework provided by the Strategy but they have been addressed to a different degree within its scope.

The Strategy is relevant to EU citizens and the economy overall, as well as to the needs of a wide range of stakeholder groups. However, some stakeholders considered that the Strategy put too little emphasis on business.

Factors that have influenced the relevance of the Strategy include:

- ***The broad and flexible*** implementation framework of the Strategy, which has enabled a mid-term review and additional action to be undertaken, once issues of increased importance have been identified, such as pollinator decline, alongside existing commitments.
- ***Evidence-based target setting*** has enabled better targeting of efforts to address biodiversity needs. However, the targets and actions could have addressed more explicitly the range of pressures that are relevant for specific ecosystems, such as pesticide pollution in agroecosystems.
- ***Engagement of stakeholders*** in the design of conservation measures - where it happened - has helped to take account of their needs, and of knowledge held by different groups, thus increasing the Strategy's relevance for these groups and helping to identify and tackle potential problems early on. Resolving significant potential trade-offs, while building on significant potential synergies between biodiversity and other policy objectives, requires transparent dialogue, as well as input from science and a long-term, holistic approach.

6.1.4. Coherence

The Strategy contributed to the Europe 2020 Strategy objectives through training, job creation, building the knowledge base using digital tools, promoting innovation (for example for green infrastructure), and citizen engagement and awareness raising activities. Overall, the EU Biodiversity Strategy is closely linked with other environmental objectives and instruments, and they are mutually supportive.

The EU Biodiversity Strategy included targets and actions directly aimed at biodiversity mainstreaming in the EU policies on agriculture, forestry, and fisheries, and the coherence of these policies with the biodiversity objective has improved since 2011. There has been progress on biodiversity mainstreaming especially at the level of broad policy objectives and instruments at the EU level, as well as frameworks for biodiversity proofing of EU funding instruments. Some aspects of incoherence have remained, including significant pressures on biodiversity, as well as limited uptake in the Member States of biodiversity support measures available under the EU agriculture, rural development, regional development, fisheries and other policies.

Factors that have influenced coherence:

- Measures to ***reward practices favourable to biodiversity***, and to compensate for incomes lost due to limitations on certain activities in protected areas. Strengthened biodiversity proofing of EU funding for biodiversity has helped to increase mainstreaming and coherence. However, despite coherent broad policy objectives,

there have been insufficient mechanisms to realise joint priorities, and insufficient incentives for seeking synergies. There are still significant pressures on biodiversity from economic activities, and investments that promote increasing pressures (such as intensification) rather than incentivising synergies.

- ***Long-term and holistic planning approaches*** have been important to ensure the preservation and regeneration of natural capital for the benefit of biodiversity and socio-economic development, and to develop win-win solutions, such as nature-based solutions to tackle wider environmental and socio-economic challenges. A strategic long-term planning approach has also been difficult due to different timelines of the Strategy and key relevant EU policies and budget cycles.
- ***Enforcement of environmental legislation*** has been crucial, and this has been supported to some extent in other policies, e.g. by cross-compliance under CAP direct payments, or CFP delegated acts restricting or banning fishing activities in marine protected areas.
- In some cases, ***insufficient monitoring frameworks, mechanisms and capacities*** to track biodiversity financing and to biodiversity-proof interventions under EU funding instruments (failures of tracking and proofing) that have resulted in continued conflicts of policy objectives.

6.1.5. EU added value

There is clear evidence of new and innovative outputs from the Strategy's implementation as well as benefits from increased cooperation, coordination and experience exchange at the EU level. The Strategy have also facilitated access to funding for biodiversity from EU instruments. It has had helped to ensure higher ambition of biodiversity objectives and attract funding under EU instruments. It's added value is lower in this regard in Member States that have long-standing established national biodiversity policy frameworks, although authorities and stakeholders in these Member States have also recognised the Strategy's value in increasing the visibility of biodiversity challenges and needs on the EU policy agenda, and in providing a coherent EU level framework for cooperation in tackling these challenges.

Factors that have influenced EU value added include:

- The establishment of mechanisms to ***facilitate transboundary cooperation*** and ***coordinated implementation***, exchange and learning, setting common best practice frameworks across the EU.
- ***Leveraging financing*** for biodiversity and support for ***innovative approaches***.
- The ***non-binding nature*** of the Strategy has been considered as a weakness ***reducing its added value***, as it has made it difficult to ensure coherent and even implementation, and reporting to the EU level.
- The lack of ***dedicated EU financing instruments*** associated with the Strategy have also been seen as a factor that has decreased its added value, although stakeholders and authorities have noted that it has increased availability of funding for biodiversity under other EU instruments, such as the EAFRD, EMFF, research and cohesion policy funds.

1.16. 6.2. Lessons learnt and follow-up

The EU Biodiversity Strategy for 2030[237] was adopted in May 2020. It responded to the high environmental ambition set by the European Green Deal[238], and drew on implementation experience[239], exchanges with stakeholders and emerging findings from the evaluation. The following section summarises how key lessons derived from the evaluation of the strategy to 2020 have been reflected in the design of the new strategy, as well as in related follow-up actions.

Lesson 1. Effective implementation requires specific, measurable targets with clear definitions, set timelines and assigned responsibilities for implementation.

Clear, quantified and time-limited targets, including such set in key relevant EU instruments like the common fisheries policy, have helped to steer and accelerate progress to the 2020 EU biodiversity objectives.

Response - The strategy for 2030 lays out a comprehensive framework of measurable and time-bound commitments, with clearly indicated responsibilities, to protect, restore and sustainably manage biodiversity in the EU and support global biodiversity. It further sets related time-bound actions and clearly indicates the responsibilities for their implementation. This includes enabling measures to boost implementation and the necessary societal transformation, as well as a detailed agenda for external actions in support of global biodiversity. Its flagship initiative, a Commission proposal for a new EU Regulation on nature restoration[240], aims to set concrete EU targets to restore degraded ecosystems.

Lesson 2. Well-designed measures for biodiversity protection, restoration and sustainable use can bring wider environmental and socio-economic benefits.

Evidence reviewed in the course of the evaluation indicates that the benefits flowing from healthy ecosystems far exceed the costs related to their protection, restoration and sustainable management, across all biodiversity targets. Better understanding of these benefits and of approaches to tap into synergies between policy objectives - for example, by deploying nature-based solutions - could have helped to mobilise more financing and support, while contributing to wider policy objectives. There is also a clear need to strengthen links between EU action for global biodiversity and for sustainable development to achieve the SDGs.

Response – the strategy for 2030 puts a strong emphasis on the potential for synergies between protecting and restoring biodiversity and wider environmental, social and economic objectives. The Commission's proposal for a new regulation on nature restoration aims to deliver benefits for biodiversity, climate mitigation and adaptation, disaster risk reduction, health and the provision of a range of further ecosystem services such as pollination and erosion protection. Furthermore, the Covid-19 pandemic raised awareness of the links between biodiversity and health, including the importance of access to nature for mental and physical health. The strategy envisages actions to strengthen these synergies, for example in the greening of urban ecosystems. It also aims to significantly reinforce an integrated approach to biodiversity and sustainable

[237] EU Biodiversity Strategy for 2030: bringing nature back into our lives (COM(2020) 380 final).
[238] European Green Deal (COM(2019) 640 final).
[239] Such as the Mid-term Review of the EU Biodiversity Strategy to 2020 (COM/2015/478 final), the State of Nature in the EU (EEA Report No 10/2020), the European environment — state and outlook 2020 (SOER 2020) and the EU Ecosystem Assessment.
[240] Proposal for a Regulation of the European Parliament and of the Council on nature restoration (COM/2022/304 final).

development in EU external action, as well as increasing coherence with internal EU policy developments.

Lesson 3. Action to halt and reverse biodiversity loss needs to cover the range of pressures on all main ecosystem types.

The evaluation found that the 2020 biodiversity targets and actions were not comprehensive in addressing all drivers of biodiversity loss across the range of ecosystem types, including key pressures such as land use changes, pollution or unsustainable maritime activities beyond overfishing.

Response – the strategy for 2030 outlines a plan to restore and sustainably manage Europe's ecosystems. For each ecosystem type, it sets targets and measures to minimise key pressures on biodiversity, and these have been mirrored in related policy initiatives, including the EU Farm to Fork Strategy, the EU Soil Strategy, the EU Forest Strategy and the EU Bioeconomy Strategy. They have also been taken into account in designing EU programmes and funding instruments under the 2021-27 multi-annual financial framework, which aims to ensure that EU investments 'do no significant harm', in line with the European Green Deal.

Lesson 4. A mixture of policy instruments is needed to deliver the biodiversity commitments.

The evaluation found that the Strategy had played an important role in providing a coherent and strategic EU level framework of targets to foster political commitment and coordinated implementation. Within it, some voluntary mechanisms and incentives worked well, either on their own or in support of existing EU legislation. However, voluntary instruments alone did not succeed in ensuring sufficient progress to the biodiversity targets. The evaluation revealed that a lack of specific binding targets often led to a failure to ensure appropriate action at different levels of governance, in particular for ecosystem restoration.

Response – the strategy for 2030 provides a coherent EU policy framework within which a range of policy instruments will help deliver its commitments. These include new legislation (where binding obligations are considered necessary – notably a Commission proposal for a Regulation on nature restoration), strengthened partnerships, guidance and financing, and voluntary instruments to incentivise economic actors and other stakeholders to act as required.

Lesson 5. A substantial increase in funding for biodiversity is necessary, with a robust tracking system.

The 2020 Strategy resulted in a significant increase in funding for biodiversity. However, it did not define clear biodiversity funding needs and targets, and was unable to ensure that the necessary funding was committed for all the action to be taken under the Strategy.

Response – the strategy for 2030 set out to meet the implementation funding needs from private and public funding at national and EU level. It indicates the scale of funding needed for its implementation and sets out measures to meet the funding needs, from private and public sources, at both EU and national level. This is matched by an increased funding ambition for biodiversity in the EU budget for 2021-27, which aims to invest 7.5% of the EU budget in support of biodiversity in 2024, and 10% in 2026 and 2027. Biodiversity objectives and measures are integrated across EU funding instruments, including in the Recovery and Resilience Facility. Developing binding restoration obligations will strengthen the legal basis for mobilising funding for

restoration measures. Improved tracking methodologies for EU funding programmes are under development.

Public funding is essential to tackle the challenges of biodiversity loss, but private finance will also be necessary. As set out in the Strategy to Financing the Transition to a Sustainable Economy, a clear and robust EU sustainable finance framework can help channel private finance to support the transition to sustainability, including the EU biodiversity objectives.

Lesson 6. EU programmes and instruments should be biodiversity-proof to ensure no significant harm.

A methodological framework was developed for biodiversity-proofing the EU budget[241]. However, its use in the national programming of EU funds has remained limited. The evaluation indicates that integration with sectoral policies has been the strongest at the level of broad policy objectives. However, the methodology for biodiversity proofing was not consistently applied at the national level to eliminate support measures that encourage unsustainable land and sea use practices.

Response – biodiversity-proofing frameworks are being improved and applied across specific sectors. The Commission has developed checklists of criteria to ensure that EU investments do no significant harm to biodiversity in line with the do no significant harm principle, for example in the context of the Recovery and Resilience Facility[242]. Strengthened biodiversity proofing will help to minimise pressures on biodiversity and increase the contribution of sectoral policies to biodiversity objectives, both at the EU level and in the EU countries.

Lesson 7. A robust biodiversity governance framework is needed to ensure responsibility for implementation, enforcement, monitoring and review, stakeholder engagement and evidence from research and science-based policy-making.

Biodiversity governance was strengthened under the Strategy to 2020, yet the evaluation found weaknesses when it came to establishing a "whole of government approach", mobilising broad ownership and accountability for the delivery of the Strategy, ensuring adequate capacity and funding, as well as effective progress reporting and review.

Response – under the strategy for 2030, an enhanced governance framework is being set up including a transparent progress-tracking mechanism with public tools to monitor implementation of the actions and the delivery of the targets, and to enable regular progress reporting and review. In this new governance framework, research and science will be better connected with political decision-making through a new Science Service, funded by Horizon Europe, and a new Knowledge Centre for Biodiversity[243]. The monitoring and review mechanism will be further developed and aligned with other monitoring frameworks under EU legislation and policies, as well as the post-2020 global biodiversity framework. Coordination among EU and national actors, stakeholder engagement and the science-policy interface have been strengthened with the launch of the EU Biodiversity Platform[244].

Lesson 8. Knowledge, awareness, capacities and skills are crucial for supporting action on biodiversity across all parts of society, sectors and levels.

[241] Common Framework and Guidance Documents for Biodiversity proofing of the EU budget.
[242] Commission Notice: Technical guidance on the application of 'do no significant harm' under the Recovery and Resilience Facility Regulation (2021/C 58/01).
[243] Knowledge Centre for Biodiversity.
[244] Commission Expert Group EU Biodiversity Platform.

The strategy to 2020 has helped to significantly improve the knowledge base on biodiversity and ecosystem services. Nevertheless, there are still significant gaps in knowledge on biodiversity and ecosystems, underlining the need for a robust biodiversity observation network and more consistent ecosystem condition reporting. Further effort is also needed to ensure that available knowledge reaches decision-makers and that it informs policy decisions and the design of policy tools.

Response – the strategy for 2030 sets out actions to strengthen biodiversity monitoring and ecosystem condition assessment for a more robust knowledge base for biodiversity policy, and ensure this knowledge is available, taken up and used in designing and implementing biodiversity measures. Such actions include for example a Commission proposal on new modules for European environmental economic accounts[245], the integrated forest monitoring system envisaged in the EU Forest Strategy for 2030, and Horizon Europe projects to strengthen biodiversity monitoring[246].

The Knowledge Centre for Biodiversity will play a key role in this process. A range of initiatives will aim to ensure that actors across the board develop the knowledge, skills and attitudes to contribute to the green agenda, such as the Council Recommendation on Learning for Environmental Sustainability and the new European sustainability competence framework[247].

Lesson 9. Biodiversity loss and climate change are interlinked and need to be tackled together.

Nature regulates the climate, and nature-based solutions, such as protecting and restoring wetlands, peatlands and coastal ecosystems, or sustainably managing marine areas, forests, grasslands and agricultural soils, are essential for emission reduction and climate adaptation. The evaluation concluded that the potential for deploying nature based solutions has not been sufficiently used to achieve synergies between improved ecosystem resilience and climate mitigation and adaptation.

Response – the strategy for 2030 sets out measures to support solutions that address both biodiversity and climate mitigation/adaptation, including the proposal for a regulation on nature restoration. Such solutions have also been integrated in key EU climate policy and legislative initiatives, including the EU Climate Adaptation Strategy, the revision of the Land Use, Land Use Change and Forestry Regulation and the Renewable Energy Directive.

As outlined above, the EU Biodiversity Strategy to 2020 did not succeed in putting in place a robust governance framework that could ensure urgent implementation efforts at scale, sufficient financing commitment as well as ownership and responsibility by all actors for delivering the biodiversity targets.

The EU Biodiversity Strategy for 2030 responds to these weaknesses. It provides a comprehensive EU framework with concrete, time-bound and measurable targets and a strong focus on win-win solutions for biodiversity, health, climate and development, as well as a range of policy instruments to ensure their delivery, with clearly assigned responsibility for implementation. Lessons learnt from the evaluation have also fed into key initiatives under the EU Biodiversity Strategy for 2030, in particular the EU proposal for binding EU nature restoration targets, the new EU biodiversity governance

[245] Commission proposal amending Regulation (EU) No 691/2011 as regards introducing new environmental economic accounts modules (COM/2022/329 final).
[246] https://europabon.org/, https://www.biodiversa.org/
[247] https://education.ec.europa.eu/focus-topics/green-education/learning-for-environmental-sustainability

framework, EU guidance documents on different aspects of implementation as well as the programming of EU funding instruments.

One of the flagship initiatives of the EU Biodiversity Strategy for 2030 is a Commission proposal for binding EU nature restoration targets. The impact assessment of this proposal has systematically built on emerging findings from this evaluation, such as:

- positive experiences in habitat restoration and the deployment of green infrastructure which demonstrate the feasibility of restoration, as well as the potential for major synergies with climate objectives;
- insights on the need for a robust governance framework that (i) sets clear quantified targets and obligations to ensure coherent and urgent restoration effort at scale across the EU, and (ii) ensures sufficient resources for implementation from a range of sources, and for tracking its effectiveness and efficiency,
- evidence on restoration approaches, costs as well as the socio-economic benefits from restoring ecosystems;
- the need for comprehensive ecosystem monitoring to build the knowledge and evidence base for policy implementation.

ANNEX 1 – PROCEDURAL INFORMATION

1) Lead DGs and internal references

This evaluation is led by DG Environment. It was included as item PLAN/2017/1319 in DECIDE.

2) Organisation and timing

An Inter-service Group to steer and provide input for the evaluation was set up in June 2018, with representatives from the Directorate Generals ENV; AGRI; BUDG; CLIMA; DEVCO (INTPA); ECFIN; ECHO; EMPL; ENER; ESTAT; FPI; GROW; JRC-Ispra MARE; NEAR; REGIO; RTD; SANTE; SJ; TRADE; and SG, as well as EASME, EEA and the EEAS. In view of the close links, the same group provided steer on the EU's Sixth National Report to the Convention on Biological Diversity (6NR).

The group met 5 times during the evaluation process.

Table 4 ISG meeting dates and topics of discussion

DATE	*TOPICS OF DISCUSSION*
01/06/2018	1st ISG meeting: discussion of overall process, draft roadmap
11/09/2018	2nd ISG meeting: presentation of public feedback on roadmap, discussion of technical specifications for support study, 6NR
26/06/2019	3rd ISG meeting: external support study inception report, consultation strategy; 6NR
June-Sept 2020	Written consultation on interim deliverables, draft stakeholder consultation questionnaire
22 March 2021	4th ISG meeting: discussion of external draft final report
5 May 2021	5th ISG meeting: external final report and discussion of draft SWD

3) Exceptions to the better regulation guidelines

No exceptions were made to the Better Regulation Guidelines[248] during this evaluation.

4) Consultation of the Regulatory Scrutiny Board

a. Upstream meeting

An upstream meeting was held with the Regulatory Scrutiny Board on 15 July 2019, with the following conclusions:

RSB Upstream comments	Reflection in text
Use existing monitoring/indicator framework as much as possible, i.e., as used in the impact assessment, mid-term evaluation, etc.	The evaluation of the Strategy uses the monitoring / indicator framework and the 2010 biodiversity baseline developed to assess progress in the Strategy's implementation (updated in 2015 and used for the mid-term evaluation and for the 6th National Report of the EU to the Convention on Biological Diversity) as explained in the "methodology" section.
Be clear on whether the focus is on evaluating the effectiveness of the Strategy or what is happening to biodiversity in the EU	Section 1.2 of the introduction specifies that the evaluation covers both the effectiveness of the Strategy (delivery of the operational targets) and what is happening to biodiversity in the EU (delivery of the headline biodiversity target).
Evaluate actual measures/implementation rather than slogans such as "avoid x"	The report reflects on implementation on the ground including actual measures undertaken (see also Annex 7 and Annex 8) and impact on the ground.
Investigate why the necessary actions are not being taken, i.e., which incentives were not aligned	Drivers of both success and failure are assessed both via the evidence review and in discussions with authorities in the Member States and stakeholders.

[248] European Commission Better Regulation Guidelines.

Discuss the follow-up of the mid-term evaluation. Was anything changed based on its findings?	Follow-up to the 2015 mid-term review is highlighted in section 2.1 (EU Roadmap for enhanced implementation in synergy with the Action plan for nature, people and the economy).
Use the public consultation to find out whether awareness in the various stakeholder groups has increased.	The public consultation included a question to self-assess respondents' degree of familiarity with the targets of the EU Biodiversity Strategy to 2020. The Commission also monitors attitudes of Europeans citizens on the issue of biodiversity via Eurobarometer surveys, the latest of which was published in May 2019.
When analysing the consultation results, do not aggregate the responses of different stakeholder groups. Instead of doing a statistical analysis, describe which group of stakeholders thought what on each issue.	The consultation report highlights differences where they could be identified in the views of different stakeholder groups. In particular, it notes a campaign by NGOs linked to the development of EU restoration targets (which provides identical responses) and a likely coordinated, but less aligned, action of forestry sector stakeholders in Poland which accounted for most of the responses to the evaluation survey of the wider consultation.
Be cautious in the use of the term "counterfactual". Views of experts on what would have happened in the absence of the Strategy do not form a counterfactual. A point of comparison could be where the EU hoped to be in 2020. Use clear benchmarks for measuring success.	The report describes a "business-as-usual" scenario (i.e. the likely development of the problem in the absence of the Strategy) that was developed in the impact assessment in 2011, with some fine-tuning. However, it acknowledges that this does not amount to a counterfactual, establishing which is complicated by interactions with existing and new EU legislation and policies (and the difficulties in separating the impacts of those, or gauging the extent to which they were influenced by the Strategy), as well as uncertainties related to wider indirect drivers. The evaluation therefore considers progress towards each of the 2020 biodiversity targets, against the 2010 biodiversity baseline as a starting point.
Be honest what the real expectations were regarding the Strategy. Do not focus on justifying past actions. Were the objectives too ambitious?	The evaluation points to the high level of ambition for biodiversity action that was set by the Heads of State in 2011, in view of the urgent need to halt and reverse biodiversity loss. However, it recognises that the success of the targets was determined not only by their own level of ambition and technical feasibility, but also by political priority and support given to this ambition at the EU and Member States' level, and by the level of acceptance by a range of actors. This is discussed in section 6.
Investigate whether the right measures were chosen and prioritised.	This is reflected in the report to the extent possible, for each of the targets (e.g. especially in the assessment of relevance).
Evaluation should reveal the main constraints to making progress.	The evaluation report reflects on the factors of both success and failure to progress towards the targets. The main constraints are presented in the conclusions (section 6).
Reports from the European Court of Auditors can be key input into evaluation. If you disagree with a finding of the Court, be clear why.	Findings from reports to the European Court of Auditors are reflected in relevant sections of the report.

On 14 January 2021, an upstream support meeting was held with the Regulatory Scrutiny Board on a different but related file: developing an impact assessment for EU nature restoration targets. The RSB advised the Commission to make clear a logical link between the findings and lessons learned from the evaluation of the EU Biodiversity Strategy to 2020, and the needs / impact assessment for EU restoration targets. This link has been highlighted in the responses to the evaluation questions, as well as in the chapters on the conclusions and lessons learnt.

On 18 May 2021, the Commission submitted to the RSB its draft Staff Working Document on the evaluation of the EU Biodiversity Strategy to 2020. On 9 June 2021, the RSB provided preliminary comments and questions that were responded in written by the Commission on 12 June 2021, and discussed at the RSB meeting on 15 June 2021. The Board gave a positive opinion on 18 June 2021

but considered that the report should further improve on a number of aspects. The RSB recommendations, and the way they have been reflected in the revised report, are presented below.

b. Changes resulting from the RSB opinion

To address the weaknesses of the evaluation identified by the RSB, the following changes were introduced to the SWD:

RSB comments	Reflection in text
Given the overall limited progress achieved on key targets and the identified implementation issues, **the evaluation should reflect on what a horizontal strategy framework can realistically achieve and what it cannot**. It should analyse how it could have better steered and interacted with the legal (possibly enforceable) acquis on biodiversity at sector and Member State level.	A reflection on the Strategy as an instrument **(Section 5.3)** has been strengthened in line with the RSB comments, providing also examples of how effective different policy instruments (under the Strategy or under related EU legislation and policies) have been in different contexts, and how they have interacted with each other.
[The evaluation] should discuss the appropriateness, scale and relevance of [the Strategy's] actions to achieve the targets. It should also reflect on whether the scope and scale of the operational targets are still sufficient to comply with the headline target in a rapidly evolving context. It could explore whether EU biodiversity policy sufficiently stepped up its political and policy profile, including in the climate debate.	Reflections on the appropriateness, scale and relevance of the Strategy's actions have been added in the analysis of **effectiveness (Section 5.1)** focussing in particular on instances where progress in implementing the actions has not resulted in similar progress in achieving the targets. Reflection on the relevance of the scope and scale of the operational targets, and on the political priority given to the Strategy, has been added to the analysis **of relevance (Section 5.3).**
The report should explain how the evaluation and the lessons learnt contribute to the 2030 Strategy and other initiatives, given that the 2030 Strategy was published in May 2020.	Section 6.2 provides a summary of how emerging insights and lessons learnt from the evaluation have been integrated in the design of the EU Biodiversity for 2030 and in key initiatives for its implementation.
The report should better identify the scope of the 2020 Strategy, clearly indicating the covered legal instruments and actions, and the links with other policy areas.	The requested clarifications on the Strategy's scope and intervention logic have been made in **Section 2. Background to the initiative**. The way the Strategy interacts with other legal instruments and EU policies, and the related difficulties in separating the impact of the Strategy from the impacts of the existing EU policies (in its absence), has been described in more detail in **Section 1.2 Scope of the evaluation,** and **Section 4.3. Limitations – robustness of findings** and in the analyses of the evaluation questions in relation to targets 1, 3 and 4**.**
It should assess more thoroughly the drivers for the lack of implementation (including at Member State level such as the enforcement and compliance aspects and accountability) across the various ecosystems, sectors and stakeholders. It should highlight more the difficulties of mainstreaming of biodiversity across the various policy areas, and identify more clearly the factors that could help to promote common policy ownership.	Further reflection on the drivers of successful – or weak - implementation has been added in the evaluation of **effectiveness (Section 5.1)**. Mainstreaming aspects are discussed in more detail in relation to Targets 1, 3 and 4 (but not exclusively). The targeted surveys and interviews in the Member States have been designed to gain insights especially into the drivers of success and failure from national implementation. The revised report now includes a detailed summary of these findings (new **Annex 8**), with examples integrated in the relevant parts of the main text.
The analysis in the stakeholder consultation should be completed, including the targeted stakeholder consultation.	The analysis of the stakeholder consultation has been completed adding further detail on the range of

	consultation activities **(Annex 2)** as well as a comprehensive summary of insights from the national level consultations **(new Annex 8)**.
The stakeholder analysis should differentiate between the views of the different stakeholder groups. It should inform the report across its various sections.	The analysis of the open public consultation (Annex 2) now also differentiates between the different stakeholder views. The new Annex 8 clearly indicates the views of different stakeholder groups. References to these views have been integrated in a systematic manner to relevant sections throughout the report.
Some more technical comments have been sent directly to the author DG.	A variety of improvements have been made on style and formatting taking into account the comments received.

5) Evidence, sources and quality

The most important sources of evidence used in the evaluation include a review of relevant literature and other documents, an online public consultation and a series of targeted interviews with Member States authorities and stakeholders at the EU level and in 10 selected Member States. Literature review covered notably reports of the EEA, the Commission and where relevant, the European Court of Auditors. These include for example the State of Nature in the EU 2020 (EEA report drawing on Member States' reporting under the Nature Directives), the State of the European Environment and Outlook Report 2020 (EEA, 2019), the first EU Ecosystem Assessment (JRC, 2020), the EU and Member States' 6th National Reports to the Convention on Biological Diversity (2019-2020), fitness checks and evaluations of key relevant EU legislation and policies. Furthermore, official national documents (such as biodiversity strategies and restoration frameworks) were reviewed in ten Member States which were selected for an in-depth evaluation of specific targets. Peer-reviewed scientific data and studies as well as biodiversity projects were further collected and analysed to complement evidence as needed.

The evaluation was supported by an external study that considered the delivery of the headline target as well as the individual operational targets and actions against each evaluation criterion in line with Better Regulation and presented its findings in an evaluation study report[249]. The technical specifications for the study and all deliverables were discussed with the Inter-service Steering Group for the evaluation of the Strategy, and comments were reflected in the final specifications.

The external evaluation study is comprehensive and provides a good evidence base for the evaluation. It acknowledges major limitations and explains how they have been addressed. For example, there is no comprehensive EU level overview of implementation efforts in the Member States in relation to restoration, green infrastructure development, forest management plans and other areas in which no reporting obligations exist. The study approach has been to draw lessons from national implementation in selected case study Member States. Furthermore, there have been very significant difficulties in attributing impacts on the ground to the EU Biodiversity Strategy and distinguishing these from impacts due to the implementation of EU legislation and policies that the Strategy aimed to support or influence (such as the EU Nature Directives, the EU Common Agricultural Policy and the EU Common Fisheries Policy). The survey has aimed to obtain information from stakeholders involved in implementation, in order to gain insights on the extent to which the Strategy's integrated approach and specific actions have helped. Findings systematically indicate whether they draw on official documents, evidence from research or views expressed by different stakeholders (also indicating the background and interest groups).

[249] Trinomics B.V. (2021) Support to the evaluation of the EU Biodiversity Strategy to 2020. Final study report.

The final report of the study was discussed at two consecutive meetings of the Inter-service steering group on the evaluation of the EU Biodiversity Strategy for 2020, in addition to written comments provided by the services. The final report of the external support study has been published.

Stakeholder consultation and targeted data collection were an important element of the exercise (see Annex 2).

ANNEX 2 – SYNOPSIS REPORT OF STAKEHOLDER CONSULTATIONS

1. Introduction

This Annex provides an overview of the consultation activities carried out in line with the consultation strategy for this evaluation, as well as the responses and results received. The **objectives of the consultations** were to collect insights on how the EU Biodiversity Strategy to 2020 had been implemented, its main achievements and failures, success factors and obstacles; how it had interacted with other policies; and how stakeholders had been engaged, or impacted in positive or negative ways, with the ultimate goal of integrating these findings into the Strategy's evaluation. Furthermore, consultations helped to explore preliminary evaluation findings with a range of stakeholders holding different perspectives.

The **main stakeholder groups** identified for the consultations were: national and sub-national authorities in charge of implementing the EU nature legislation, EU and national biodiversity and other key relevant policies (especially for targeted consultations in the ten Member States selected for case studies), socioeconomic actors, in particular EU, national and sub-national umbrella organisations of stakeholders in key sectors (such as agri-food, forestry, fisheries, hunting, tourism, health, industry, business and finance) that have been involved in the Strategy, or have been affected by its implementation, international organisations engaged in EU and global biodiversity and related policy areas (climate, sustainable development), non-governmental organisations active in conservation, wider environmental and social issues or animal welfare, research and academia as well as the citizens.

The main **consultation activities** were:

- Feedback on the Evaluation Roadmap was received in the period 20 June – 18 July 2018
- A stakeholder conference to discuss preliminary evidence to be taken into account and identify key issues and stakeholder concerns to address in the evaluation (Brussels, 24 June 2019). The conference report is published on the webpage of the EU Biodiversity Strategy to 2020.
- Targeted EU-level stakeholder interviews conducted between October 2020 and March 2021;
- Case studies on the implementation of the Strategy in 10 EU Member States, including more in-depth surveys on selected biodiversity targets. The related consultation activity included written surveys and targeted interviews with a small number of national level stakeholders, conducted between November 2020 and March 2021.
- An online public consultation (OPC) open for feedback to all interested stakeholders as well as individual citizens, which ran from January 2021 until early April 2021.

In addition to these consultation activities as part the evaluation exercise, discussions on the implementation of various aspects of the EU Biodiversity Strategy to 2020 continued with Member States and stakeholders at the Coordination Group for Biodiversity and Nature.

2. Outcomes of the consultation activities

2.1. Feedback on the evaluation Roadmap

The Roadmap for the evaluation of the EU Biodiversity Strategy to 2020 was published on 20 June 2018 and remained open for public feedback until 21 July 2018. A total of 16 responses were submitted, mostly by business and stakeholder organisations (5) and NGOs (4), as well as 2 citizens, a public authority, a research institution and an international conservation organization. Most responses provided a combination of recommendations for the evaluation study approach and for the post-2020 biodiversity policy framework.

The main recommendations for the evaluation scope and approach are summarised below:

- Apply an evidence-based evaluation approach (robust data and monitoring)
- Engage sector stakeholders, use non-technical language in the consultations
- Seek to identify underlying causes of failure and wider contexts and factors
- Assess policy coherence with other policies such as agriculture, marine and fisheries, trade, forestry, as well as trade-offs between biodiversity targets and other policy objectives.
- Reflect on the global biodiversity impacts of EU consumption.

These recommendations have been taken up in the evaluation scope and approach.

The main recommendations for post-2020 are summarised below:

- Use the evaluation findings to inform the EU as well as the global post-2020 debates
- Formulate ambitious and measurable post-2020 objectives as well as new tools for implementation.
- Strengthen links between biodiversity goals, climate and the Sustainable Development Goals.
- Reflect biodiversity objectives and needs in the Multiannual Financial Framework
- Step up biodiversity governance.
- Support research into the links between biodiversity, ecosystem services and food.

These points have been taken into account in the design of the EU Biodiversity Strategy for 2030.

2.2.Public Consultation

A joint consultation was open for public feedback over a period of 12 weeks, from January to April 2021. The survey (in addition to a common section on the background of the respondents) consisted of three distinct questionnaires on interrelated EU biodiversity policy initiatives:

1. Evaluation of the EU Biodiversity Strategy to 2020
2. Review of the application of the EU Regulation on Invasive Alien Species
3. Development of binding EU nature restoration targets

The consultation on these initiatives was carried out in one joint survey due to their clear interconnections and in order to reduce the risk of confusion or consultation fatigue. Respondents could choose to answer only one, two or all three surveys. Most questions were multiple-choice and included one or more ‘opt-out’ responses, as well as an opportunity for the respondent to expand on their answers in an open text response box. An open question was asked near the end of the questionnaire, to allow respondents to provide further feedback, information, links or files.

This analysis focuses on Part 1 (evaluation) covering 15 questions, of which 12 were multiple choice. The analysis also provides a concise overview of the responses to part 2 (IAS application review), which is relevant to the evaluation of Target 5 or the EU Biodiversity Strategy to 2020.

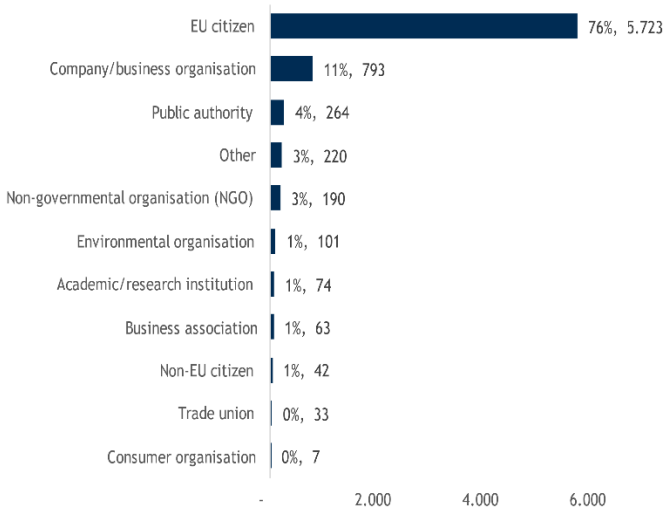
- **Distribution of responses**

A total of 111,842 respondents filled in the questionnaire, among which a large number answered as part of campaigns. The majority of the responses were part of an NGO campaign "#RestoreNature" which targeted the questionnaire on developing EU binding nature restoration targets. Beside this, 7,510 individual responses remained that formed the majority of contributions on the evaluation of the EU Biodiversity Strategy to 2020. These filtered responses are analysed in this report.

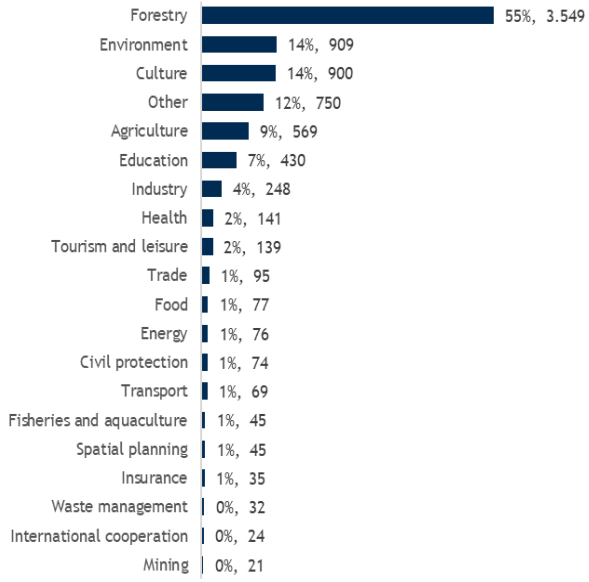
- **Overview of geographical spread of responses and stakeholder categories**

Out of the 7,510 respondents, the majority originated from Poland (6,710; 89%), followed by Germany (251; 3%), Belgium (82; 1%) and France (70; 1%). The types and main area of activity of the respondents are presented in figure II-1 and figure II-2 below:

Fig. II-1. Type of respondents to the survey



II-2 Area of activity of respondents



Notably, 83% of trade unions (24) and 82% of companies/businesses (616) selected forestry. The fact that a very high share of the respondents originated from Poland, and those were primarily active in the field of forestry, is important to take into account while analysing the results of this OPC. Firstly, even in the absence of a formally announced campaign, it suggests that stakeholders from this sector and Member State did communicate more intensively and mobilised in some form to respond, showing particular interest in the topic of the consultation. Secondly, the resulting high share of respondents from this sector means that their views were represented to a higher degree than other interest groups in each answer.

1.1.1. Overview of survey results: Evaluation of the EU Biodiversity Strategy to 2020

There was no requirement to respond to all questions. The percentage of respondents who have given a specific answer to each question is based upon the total number of responses to this question, and not on the total number of respondents in the survey. This applies also to open text responses. The sections below present for each question:

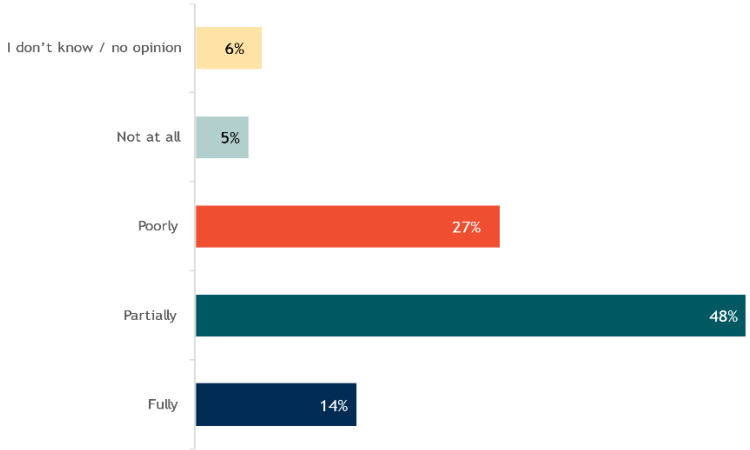
1) An overview of all quantitative responses;
2) An overview of quantitative responses in selected questions;
3) A breakdown of key diverging responses (where applicable) per sectoral stakeholder type.
4) Campaign responses are separately analysed at the end of this chapter of the report.

Question 1. *The 2020 Biodiversity Strategy set six targets, which together should have enabled the EU to halt and reverse the loss of biodiversity and ecosystem services. How familiar are you with these targets?*

	Very familiar	Moderately familiar	Slightly familiar	Not at all familiar
Target 1. Fully implement the EU Birds and Habitats Directives	42%	39%	14%	5%
Target 2. Maintain and restore ecosystems and their services	39%	41%	16%	4%
Target 3. Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity	48%	34%	13%	4%
Target 4. Ensure the sustainable use of fisheries resources and marine ecosystems	25%	22%	36%	17%
Target 5. Combat invasive alien species	37%	39%	18%	6%
Target 6. Help avert global biodiversity loss	32%	42%	21%	5%

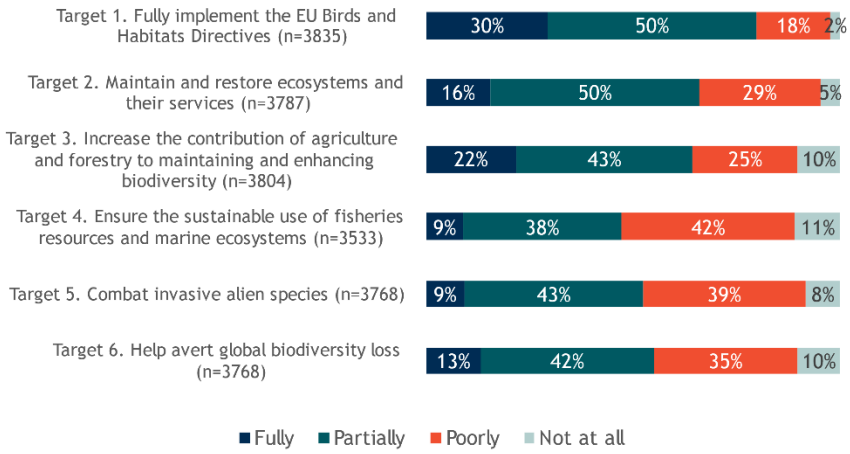
Overall, participants Most respondents indicated that they are fairly familiar with the six targets of the Strategy, with 82% answering “moderately familiar” or “very familiar” for Targets 1 and 3. Target 4 was markedly the least familiar to respondents.

Question 2. *To what extent has the EU met the objective of halting biodiversity loss and the degradation of ecosystem services in the EU by 2020, and restoring them as far as feasible?*



Almost half of the respondents to this question assessed the EU as having partially met the headline biodiversity target (1,995; 48%). The majority of respondents (2,583; 62%) had a rather positive view answering either "partially" or "fully" to this question, compared to 32% (1,305) who answered "poorly" or "not at all". Stakeholders who answered 'fully' largely belonged to the forestry sector (310; 53%, with 309 of respondents from the Polish forestry sector), whereas those who responded 'poorly' belonged mostly to environment (252; 23%), forestry (224; 20%) and culture (208; 19%).

Question 3. *To what extent has the EU achieved the following targets?*



Performance was the best rated under Targets 1 and 3, with 1,033 (30%) of respondents saying that Target 1 was fully achieved, and 764 (22%) of respondents considering that Target 3 was fully achieved. Target 1 scored best in terms of combined "fully" and "partially" responses (80%), followed by Target 2 (66%) and Target 3 (65%). Target 4 was the only one for which more respondents answered "poorly" or "not at all" (1,217; 53%) than "partially" or "fully". Target 4 was also the one with the highest share of "I do not know/no answer" (1,234).

The table below presents the predominant response given by respondents in several main fields:

Agriculture	Partially (48%)	Partially (46%)	Partially (40%)	Poorly (41%)	Partially (41%)	Partially (36%)
Culture	Partially (47%)	Partially (44%)	Partially (36%)	Poorly (41%)	Partially (43%)	Poorly (38%)
Education	Partially (43%)	Poorly (43%)	Poorly (38%)	Poorly (45%)	Partially (46%)	Poorly (43%)
Environment	Partially (52%)	Poorly (42%)	Poorly (35%)	Poorly (48%)	Poorly (44%)	Poorly (44%)
Forestry	Partially (53%)	Partially (63%)	Partially (56%)	Partially (44%)	Partially (48%)	Partially (49%)
Industry	Partially (50%)	Partially (48%)	Partially (43%)	Poorly (44%)	Poorly (43%)	Partially (42%)

Question 3a. *Please highlight significant achievements and/or success factors*

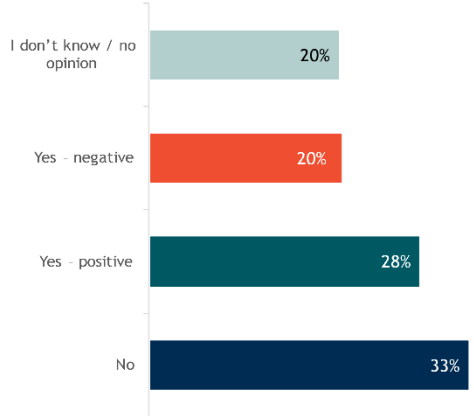
A total of 55 open text responses were received. They highlighted the benefits for habitats and species stemming from the implementation of the Birds and Habitats Directives and other forms of nature protection (11: 9 EU citizens, 2 NGOs); increased awareness (6: 5 EU citizens, 1 business association) and bottom-up conservation approaches giving preference to regional/local rather than

EU biodiversity measures (8: 4 EU citizens, 2 company/business organization, 1 NGO, 1 public authority, with six of the responses originating from Poland forestry). Other achievements mentioned included increased funding for protection (3: 2 EU citizens, 1 NGO); improved agri-environment payments (2: EU citizen and company/business organization); and the Regulation on Invasive Alien Species (2: EU and non-EU citizen).

Question 3b. *Please highlight significant gaps and/or reasons for failure*

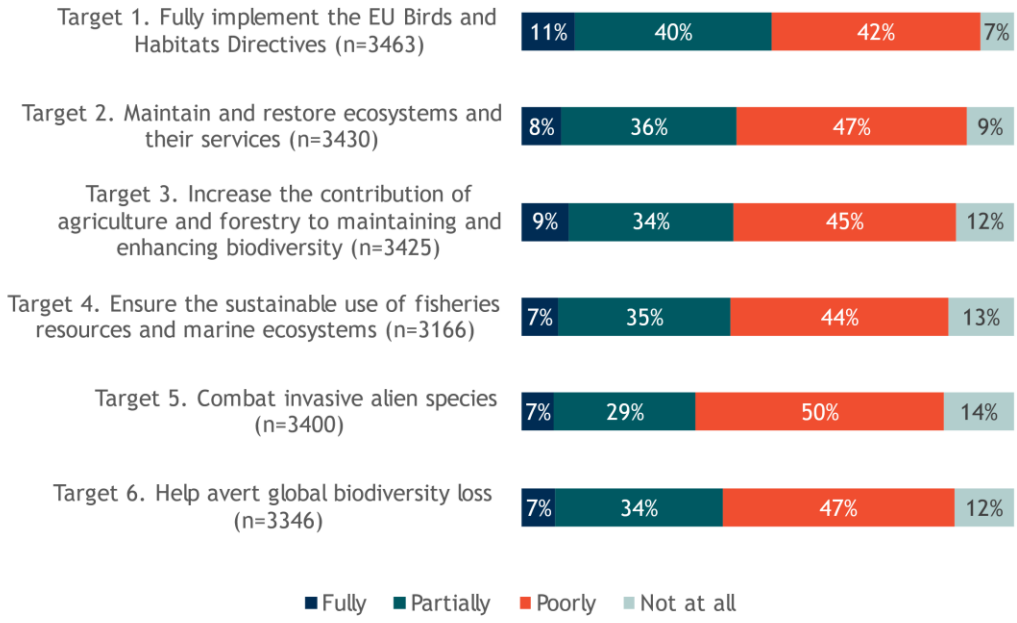
A key reason for failure noted by stakeholders in open text responses was the lack of integrated, holistic approaches to halting biodiversity loss. 12 respondents noted conflicts in the management of biodiversity and contrasting approaches between MS and EU/international decision making (4: 3 EU citizens, 1 academic/ research institution) and diverging economic interests amongst actors in implementing biodiversity-related measures (5: 4 EU citizens, 1 academic/ research institutions). The formulation of the Strategy itself was regarded as a reason for failure in 7 open responses, particularly regarding: the 'lack of enforceability' due to the non-binding nature of targets and actions (5: 4 EU citizens, 1 academic/research institution), and poor definition of the targets (2 EU citizens). Lack of enforcement was noted by 3 stakeholders (1 EU citizen, 1 NGO, 1 company/business organisation).

Question 4. *Have you identified, since 2011, significant impacts on your sector, field of activity or living area that have resulted from the implementation of the EU Biodiversity Strategy to 2020?*



More respondents identified significant impacts (1,558; 48%) than those who didn't (1,071; 33%). Within the identified significant impacts, most were positive (908; 58%), but there was also a significant share of identified negative impacts (650; 42%). As shown in the figure below, environment and forestry sector stakeholders provided the largest proportion of 'yes-positive' responses within their groups, whereas the majority of industry stakeholders (48; 55%) responded that they had not identified any significant impacts.

Question 5. *Has funding for biodiversity been sufficient to support the implementation of the EU 2020 biodiversity targets?*

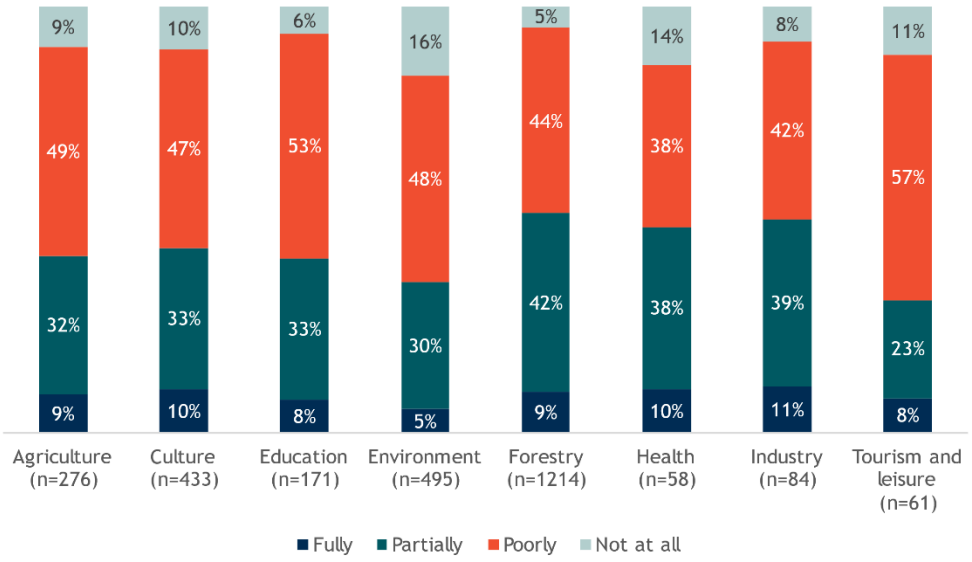


Note: The answers "I do not know/no opinion" are not included in the percentages.

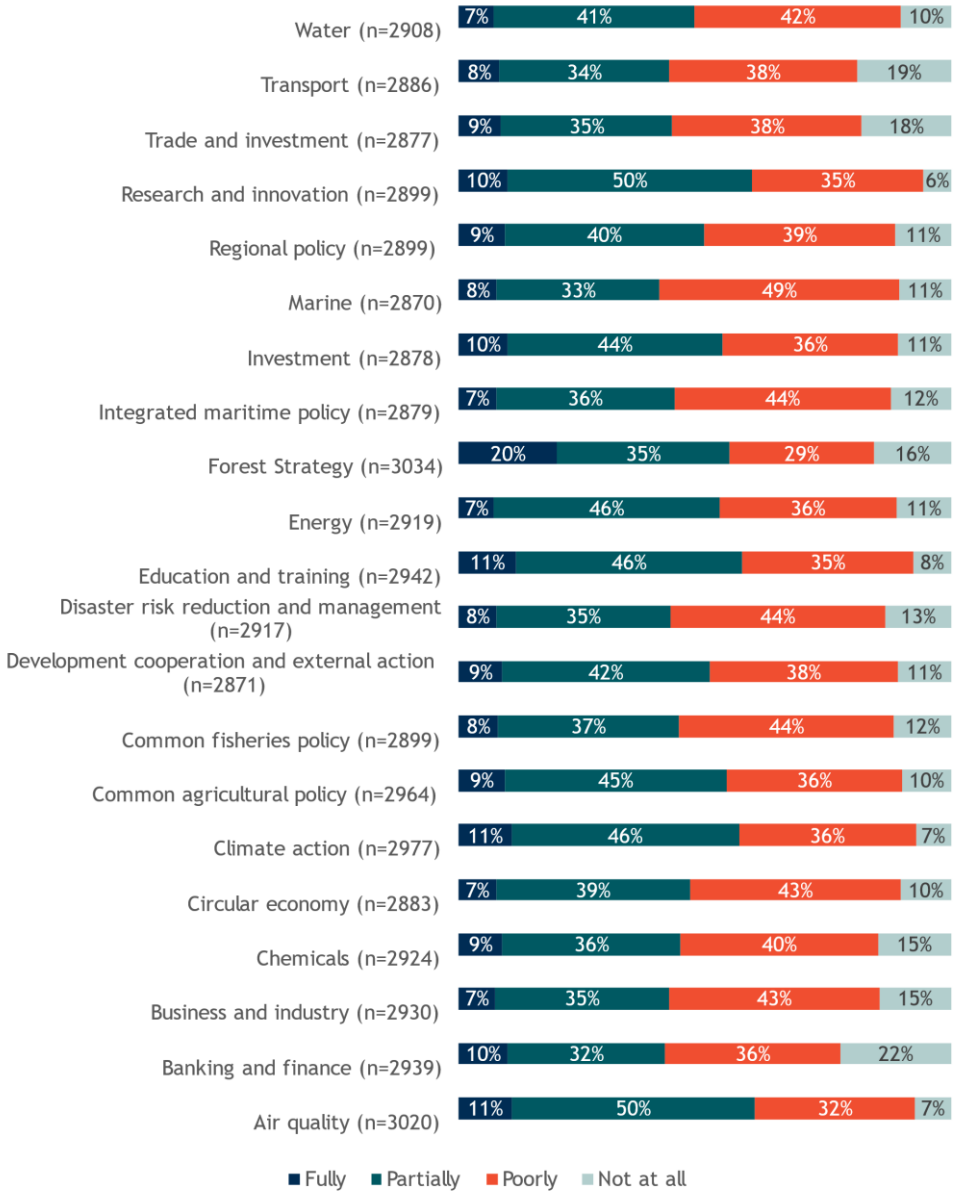
Only a small minority of the respondents considered that funding for any of the targets had been fully sufficient. Funding for Target 1 was deemed fully or partially sufficient by just over half of the respondents (1,395; 51%) while most respondents considered that funding was poorly or not at all sufficient for Target 5. Question 5 received the most "I do not know/no opinion" responses.

Industry, health and culture sector representatives provided the greatest share of responses identifying funding as 'fully' sufficient to support the implementation of Target 2. The tourism, leisure and education sections provided the greatest proportion of 'poorly' responses. The figure below shows the distribution of responses among representatives of different fields of activity (only showing the key sectors from which more than 50 representatives responded).

Question 5. *Has funding for biodiversity been sufficient to support the implementation of the EU 2020 biodiversity targets?*



Question 6. *To what extent have the EU biodiversity targets to 2020 been integrated in the design and implementation of the following EU policies?*



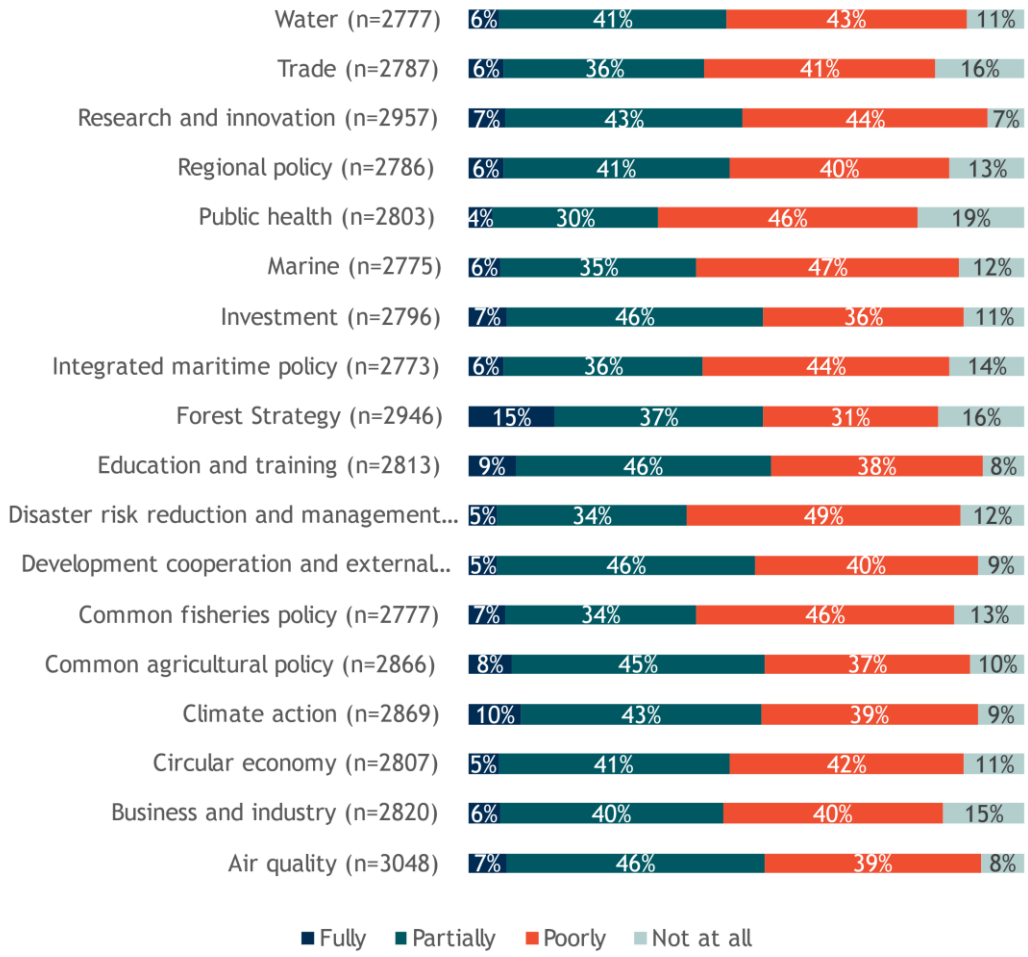
Note: The responses "I do not know/no opinion" are not included in the percentages.

The Forest Strategy was the EU policy area for which the highest share of respondents believed that the EU biodiversity targets to 2020 had been fully integrated in its design and implementation (531; 20%). This result represents the views of the high number of respondents to the questionnaire from the forestry sector (37% of respondents were from forestry sector, of which 25% stated 'fully', 42% 'partially', 18% 'poorly', 7% 'not at all' and the remaining answered 'I don't know/no opinion').

Air quality was the best rated EU policy in terms of full and partial integration of the EU biodiversity targets to 2020 (1,520; 60%), followed by Research and Innovation (1,265; 60%), Education and training (1,324; 58%) and Climate action (1,450; 57%). The EU policy area with the highest share of respondents believing that it has not aligned itself at all with the EU biodiversity targets to 2020 was Banking and finance (360; 22%). The area with the highest combined share of

"not at all" and "poorly" responses was Marine policy (884; 59%). Marine policy was also the area where most respondents did not know or had no opinion on the question (1,378; 48% of the total number of respondents to this sub-question).

Question 7. *To what extent has the EU Biodiversity Strategy to 2020 contributed to the objectives of the following EU policies?*



Note: The answers "I do not know/no opinion" are not included in the percentages.

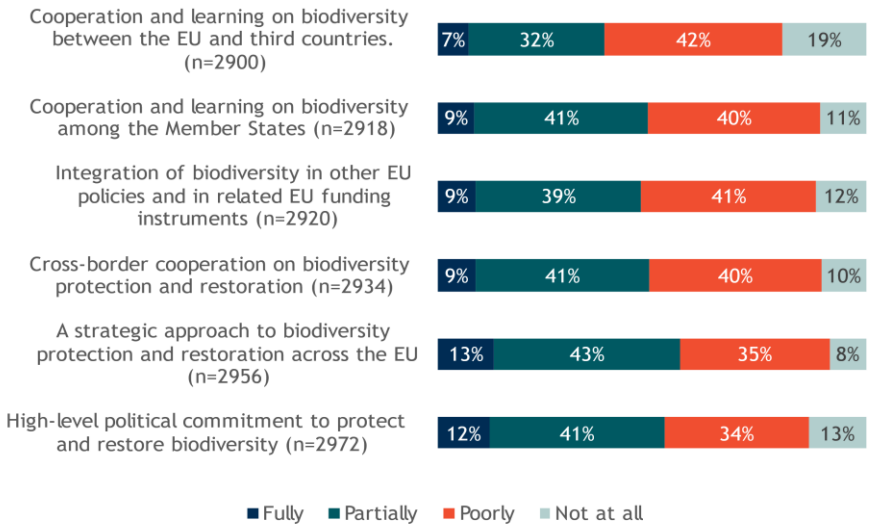
The Forest Strategy was the EU policy with the highest share of respondents believing that the EU Biodiversity Strategy to 2020 had fully contributed to its objectives (393; 15%) (see note to the previous question on the share of forest sector representatives). Education and training was the policy with the highest share of respondents whom believed that the EU Biodiversity Strategy to 2020 had fully or partially contributed to its objectives (1,194; 54%), closely followed by several policies for which this share reached 53% (Air quality, Climate action, the Common Agricultural Policy, the Forest Strategy, and Investment).

The EU policy area with the highest share of respondents believing that the EU Biodiversity Strategy to 2020 had not contributed at all to its objectives was Trade (282; 16%), and the area with the highest combined share of "not at all" and "poorly" responses was Public health (1,352; 66%). Again, Marine policy was the area where most respondents did not know or had no opinion on the question (1,378; 50% of the total number of respondents to this sub-question).

Question 8. *To what extent has the EU Biodiversity Strategy to 2020 responded to the main biodiversity needs and issues in the EU?*

Two-thirds of the respondents to this question assessed the EU Biodiversity Strategy to 2020 as having fully or partially responded to the main biodiversity needs and issues in the EU (2,329; 65%). A number of stakeholders added an open statement that further integration and coordination is needed with agriculture (42%), land use (21%) and energy (21%) policies.

Question 9. *To what extent has the EU Biodiversity Strategy to 2020 helped to ensure*



Note: The answers "I do not know/no opinion" are not included in the percentages.

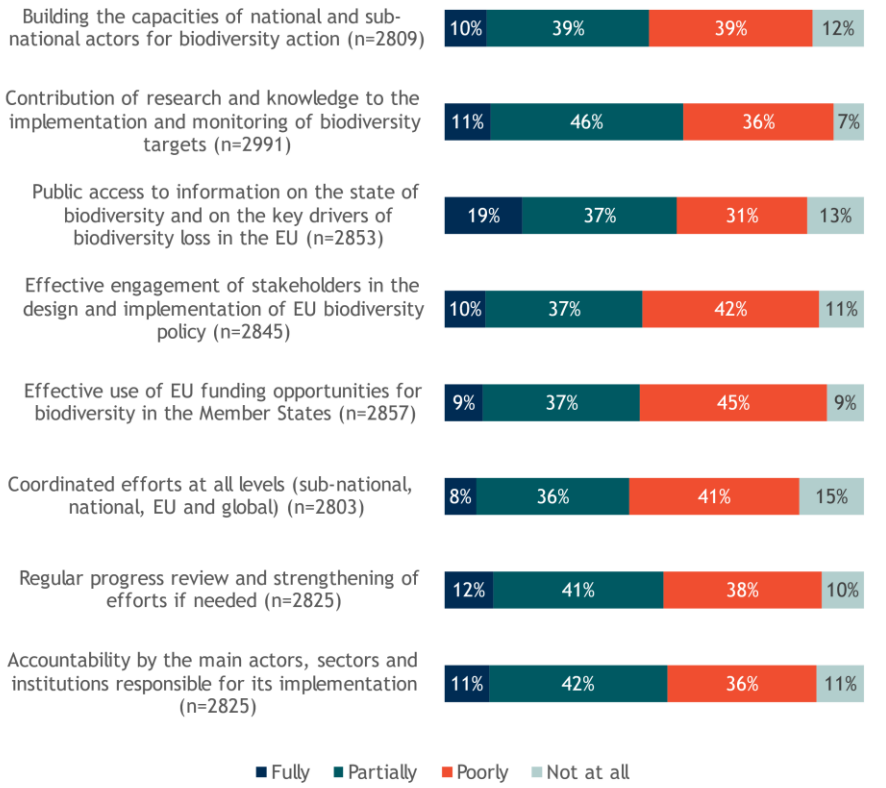
The contribution of the EU Biodiversity Strategy to 2020 to a strategic approach to biodiversity protection and restoration across the EU was acknowledged by the highest number of respondents, with a combined share of 57% of respondents believing it had fully or partially contributed. The EU Strategy's contribution to ensuring a high-level political commitment to protect and restore biodiversity was also well-rated, with 53% of respondents believing that it had at least partially contributed. Its contribution to cooperation and learning on biodiversity between the EU and third countries was rated the lowest, with 61% of respondents arguing the Strategy had contributed poorly or not at all.

Question 10. *Should any aspects of the EU Biodiversity Strategy to 2020 have been dealt with at national or local level, rather than at the EU level?*

Three-quarters of the respondents to this question considered that some aspects of the EU Biodiversity Strategy to 2020 should have been dealt with at the national or local level, rather than at the EU level. Some respondents noted in open text that taking into account national and local level biodiversity characteristics and local knowledge is key to robust policies.

Analysed by main areas of activity, representatives from the following sectors responded 'yes' by more than 75%: forestry (2006; 96%), culture (400; 76%), agriculture (273; 85%), civil protection (32; 78%), fisheries and aquaculture (23; 82%), food (29; 76%) industry (92; 76%), mining (11; 85%), tourism and leisure (60; 75%) and waste management (15; 79%).

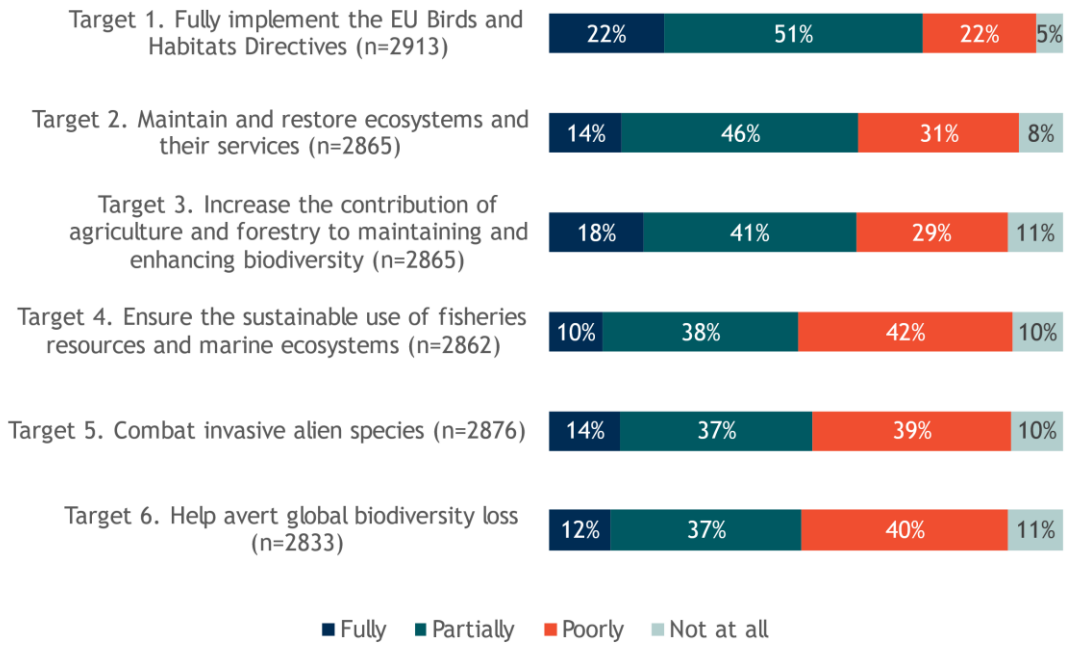
Question 11. *The EU Biodiversity Strategy to 2020 established a common implementation framework to track progress in reaching the targets and ensure coordinated implementation at all levels. To which extent has this framework ensured:*



Note: The answers "I do not know/no opinion" are not included in the percentages.

The-highest rated aspect of the Strategy's governance was ensuring the contribution of research and knowledge to the implementation and monitoring of biodiversity targets, with 57% of respondents (1,400) responding in "fully" and "partially". Public access to information on the state of biodiversity and on the key drivers of biodiversity loss in the EU, regular progress review and strengthening of efforts if needed and accountability by the main actors, sectors and institutions responsible for its implementation all ranked above 50%. The framework was deemed to have worked the least well in coordinating efforts at all levels (sub-national, national, EU and global), with 15% of respondents (509) believing it had not ensured such coordination at all, and 41% of respondents (903) stating that it had done poorly. The percentage of "I do not know/no opinion" replies was relatively high, varying between 15% and 20%.

Question 12. *To which extent has the monitoring framework for the EU Biodiversity Strategy to 2020 enabled the tracking of progress in reaching the targets?*



Note: The answers "I do not know/no opinion" are not included in the percentages.

The highest share of respondents (1,716; 73%) considered that the monitoring framework was fully or partially adequate to track progress towards Target 1, with 22% saying the framework had fully enabled the tracking of progress. The highest proportion of answers the monitoring framework had enabled the tracking of progress poorly, or at all, related to Target 4 and Target 6. Target 4 received the highest share of "I do not know/no opinion" replies (1,234; 43% of the total replies to this sub-question). Key hindrances to monitoring noted by stakeholders in open text included the lack of systematic, comprehensive monitoring frameworks (7 EU citizens, 3 NGOS, 1 business, 1 "other"), the lack of standardised monitoring approaches (3 EU citizens, 2 company/business organisation, 1 NGO) and general lack of coordination/ information disseminated between relevant actors (4 EU citizens, 1 "other").

Question 13. *Other comments*

A number of key themes emerged from a randomised selection of responses provided in this section. These included: perceived lack of ambition of the Strategy and/or the non-binding nature of its targets and actions as key barriers (citizens, company/business organisations), the need for greater enforcement of legislation (EU citizens, academic/research institute, NGOs) and greater knowledge sharing practices (EU citizens). In addition, papers uploaded to the survey referred to:

- In relation to Target 6: acknowledgment of EU efforts to prioritise biodiversity investments in development cooperation; criticism for failures to reduce the impacts of EU consumption on biodiversity and forests outside of the EU and the lack of compliance measures for trade and sustainable development in Free Trade Agreements (in contrast to the other FTA chapters); and pointing to the need for engagement and support of Indigenous Peoples and local communities, and for more investment in biodiversity under the Neighbourhood, Development and International

Cooperation Instrument. Gaps in the Strategy are highlighted in relation to links with health policy, illegal and unsustainable wildlife trade, global oceans and fisheries.

- In relation to Target 4: criticism of the Strategy's failure to protect species and habitats in marine ecosystems, obstacles to achieving Targets 1 and 4 related to commercial fishing, dredging, construction, shipping and boat traffic, and challenges in coordination between the Common Fisheries Policy, the Marine Strategy Framework Directive and the Water Framework Directive.

2. Analysis of campaigns

During the analysis of the OPC responses, one major campaign was identified. It consisted of 104,333 identical responses in Section III of the survey (consultation on legally binding EU nature restoration targets), and was jointly organised by BirdLife, EEB, and WWF EPO. The pre-filled responses were available on http://www.restorenature.eu/. These responses were not included in the analysis of this report, as they concerned another section of the survey and not this evaluation.

A set of 38 identical open text responses was located in Section I of the survey, indicating another coordinated action. These responses are highlighted in the table below.

Table B. Campaign responses identified

OPC Question	Response
3A	The successes in protecting biodiversity in the area are not due to the EU biodiversity strategy, but to initiatives of the regions and member states that formulate corresponding goals with a bottom-up approach.
3B	The static approach of the biodiversity strategy contradicts the dynamic development of biodiversity at the local / regional level; Climate change not taken into account; there is no partnership approach with owners / managers.
4	The EU biodiversity strategy follows a top-down approach, which neither appreciates the experiences and the achievements of forest and land owners nor supports them in a sustainable way.
8	The strategy is unsuitable for responding to the challenges of biodiversity. The top-down approach is counterproductive, it does not take regional specificities into account.
11	In practice, public access to information is interpreted in a very one-sided way. Forest owners are not seen as partners in protecting biodiversity. Activities to protect biodiversity are not implemented as strictly in all sectors as in the forest.
12	Target 1, 2, 3 and 5: All of these targets are documented through legislation (Natura 2000, WFD, IAS Regulation, EUTR) and through regular monitoring and reporting. Target 6: The EU has no competences to regulate third countries to protect biodiversity .
13	The successful protection of biodiversity can only take place at the local and regional level. Bottom-up and voluntary approaches in partnership with forest

	owners are more successful and sustainable. The EU's approach leads to a loss of acceptance among forest owners. Sustainably and multifunctionally managed forests must no longer be misused as "green washers" for other sectors.

2.3.Targeted consultations of EU-level stakeholders

Approach

Twenty-four targeted interviews were conducted with EU-level umbrella organisations. The interview protocol was designed and executed after a rigorous literature review.

- **Step 1: Questionnaire development**

Only open questions were used in the interview questionnaires. The interviews followed the evaluation questions, with additional specific questions tailored to the interviewee's background.

- **Step 2: Stakeholder selection**

A preliminary list of stakeholders was prepared among EU and international institutions, Member States' representatives, industry and environmental NGOs and academic institutions, and finalised in consultation with the Commission. The list included 10 NGOs, 5 business associations and 4 research organisations. The project team pre-contacted the invited organisations and introduced the expected topics to be covered in the interview, in order to enable them to inform their networks and prepare. Following this first informal exchange, a formal invitation was sent to the organisation by email. Lastly, an interview questionnaire and contact details of the interviewer were shared.

- **Step 3: Organization and facilitation of interviews**

Due to the restrictions introduced in response to the Covid-19 pandemic, all interviews took place remotely, using online teleconferencing. In addition, and to ensure a high response rate, written responses to the questions were also accommodated.

Analysis

The interview minutes, written feedback and additional evidence and studies provided by the interviewees has been synthesised and analysed in the final report of the support study, and has been used in the preparation of the evaluation report.

2.4.Targeted consultations in ten selected Member States

As part of the support study for the evaluation of the EU Biodiversity Strategy to 2020, the contractor carried out a literature review, written survey and sixty-five targeted interviews with national and regional level actors in ten EU Member States.

The aim of this consultation was to gain insights from successes, challenges and stakeholders' experiences in national implementation. Interviewees included experts in central and regional

authorities, sector stakeholder associations, NGOs and academic/research representatives. In each Member State, the interviews focussed in more detail on the implementation of 2-3 targets.

Annex 8 presents key insights extracted from these targeted consultations. (A detailed record of the contributions from these consultations is presented in Appendix C of the external evaluation report.)

ANNEX 3 – METHODS AND ANALYTICAL MODELS USED IN PREPARING THE EVALUATION

This evaluation uses the standard policy evaluation criteria and follows a well-defined methodology in accordance with the Better Regulation Guidelines[250]. The evaluation criteria were further operationalised through evaluation questions that guided this evaluation, taking account of the cross-cutting nature of the strategy and its very broad scope. The evaluation matrix below provides an overview of the questions and sub-questions considered in the evaluation in relation to the entire strategy or its individual elements, as well as the indicators used and the main tools used to derive the necessary information and analysis.

No modelling was considered necessary in this evaluation.

[250] European Commission Better Regulation Guidelines.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
Effectiveness			
Evaluation question 1: To what extent has the Biodiversity Strategy worked as expected?			
1.1 To what extent is the EU Biodiversity Strategy on track to achieve the ***six operational biodiversity targets*** and the ***headline target*** by 2020, and to progress towards the 2050 vision?	Headline Target: 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.	*Summary of below indicators*	Evidence collection and review from literature (Main documents: EU 6NR to CBD, SOER 2020, SON 2020, IPBES 2019, IPBES 2020)
	Target 1: Fully implement Birds and Habitats Directives – To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments: (i) 100 % more habitat assessments and 50 % more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50 % more species assessments under the Birds Directive show a secure or improved status	SEBI 03: Conservation status of species of European interest SEBI 08: terrestrial SCIs and marine SCIs; -SEBI 13: Fragmentation of natural and semi-natural areas Protected Connected (ProtConn) indicator of terrestrial PA connectivity Ecoregion Coverage Statistics Species facing risk of extinction	Evidence collection and review from literature Stakeholder consultations (OPC, EU level stakeholder interviews, case studies in the Member States) EU 6NR to CBD, SOER 2020, SON 2020
	Target 2: To maintain and enhance ecosystems and their services: By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems	SEBI 05: Conservations status and trends for habitats CSI14: Land take EEA CSI 054: Landscape fragmentation pressure from urban and transport infrastructure expansion - EEA SEBI 013: Fragmentation of natural and semi-natural areas Share of forest area Proportion of EU surface waters in good ecological status (SEBI 16: Freshwater quality) Uptake of EU level guidance (Green Infrastructure, proofing, NNL). (MAES barometer)	Evidence collection and review from literature Targeted survey in the Member States (Most relevant: NL, BG, DE, SK and RO) MAES reports including Ecosystem Assessment. SON 2020, SOER 2020.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
	Target 3a: Agriculture: By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement* in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 Baseline, thus contributing to enhance sustainable management	SEBI 01: Abundance and distribution of selected species Area under organic farming Gross nutrient balance on agricultural land SEBI 019: Agriculture: nitrogen balance Indicator: Estimated soil erosion by water SEBI 3: Selected a) forest species and b) agricultural species SEBI 5: Selected a) forest habitats and b) agricultural habitats	Evidence collection and review from literature, triangulation with: Interviews with experts and informed stakeholders Targeted survey / questionnaire in the case studies (e.g. "How effectively is the CAP being used to maximise biodiversity conservation in agricultural areas?".) (Most relevant: BG, DE, ES, GR, SK and RO). (Relevant documents: evaluation of CAP Greening; Study of CAP impacts on biodiversity, soil and water; State of Nature 2020; ECA reports; EU-wide ecosystem assessment - Agroecosystems.)
	Target 3b: Forests: By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM), are in place for all forests that are publicly owned and for forest holdings above a certain size** (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that or receive funding under the EU Rural Development Policy, in line with Sustainable Forest Management (SFM) so as to bring about a measurable improvement* in the conservation status of forest ecosystems and species and in the provision of related ecosystem services as compared to the EU 2010 Baseline	SEBI 3: Selected a) forest species and b) agricultural species SEBI 5: Selected a) forest habitats and b) agricultural habitats SEBI 1: Forest bird index SEBI 18: Forest deadwood Grassland butterflies – population index (BCE) % publicly owned forests with FMPs or equivalent, and forest holdings above a certain size**	Evidence collection and review from literature Follow-up surveys/interviews Case study (most relevant: LT) (CAP impacts on biodiversity, soil and water; State of Nature 2020; ECA reports; EU-wide ecosystem assessment – Agroecosystems).
	Target 4:To ensure the sustainable use of fisheries resources: Achieve Maximum Sustainable Yield (MSY) by 2015. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with no significant adverse impacts on other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020, as required under the Marine Strategy Framework Directive	Estimated trends in fish stock biomass Assessed fish stocks exceeding fishing mortality at maximum sustainable yield (Fmsy) CSI 032: Status of marine fisheries stocks SEBI 03 Conservation status of species of European interest related to marine ecosystems SEBI 05 Conservation status of habitats of European interest related to marine ecosystems SEBI 21 Fisheries: European commercial fish stocks Attainment of MSY	Evidence collection and review from literature Follow-up surveys/interviews. (Most relevant case studies: BG, LT, ES, IT and RO). Scientific, Technical and Economic Committee for Fisheries (STECF) Mediterranean and Black Sea assessment

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
	Target 5: To control invasive alien species (IAS): By 2020, invasive alien species and their pathways are identified and prioritised, priority species controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS.	SEBI 10: Invasive alien species in Europe List of IAS of Union concern List of IAS of Union concern Pathways, management measures Member States' implementation measures (reporting) EASIN.	Evidence collection and review from literature Interviews / survey questions (most relevant case studies: BG, DE, GR, FI, and IT) Upcoming review of the application of the IAS Regulation (mid-2021)
	Target 6: To help avert global biodiversity loss: By 2020, the EU has stepped up its contribution to averting global biodiversity loss.	SEBI 23: Ecological footprint, biocapacity, reserve or deficit in EU-28 Resource mobilisation (EU + MS) TSD chapters in Free Trade Agreements Harmful subsidies studies (proofing methodologies)	Evidence collection and review from literature Follow-up interviews and surveys in the case studies (all Member States are relevant). Member States' and EU 6NR to CBD (2020) and EU Financial Reporting to CBD (2020)
1.2 To what extent have the ***actions*** defined under the strategy been implemented at the EU level and in the Member States?	Action 1: Complete the establishment of the Natura 2000 Network, and ensure good management (sub 1: Establish Natura 2000, complete by 2012, Sub 1b: Further integrate species and habitat protection and management requirements into key land and water use policies with and beyond Natura 2000, 1c: Management Plans in place for N2000, 1d: cross border collaboration N2000)	Natura 2000 coverage – Natura 2000 barometer Does biophysical data directly address 'completeness'? Management objectives and measures Cross-border collaboration (biogeographic regional process)	Evidence collection and review from literature
	Action 2: Ensure adequate financing of N2000	Total financing needs (PAFs) Total expenditure on N2000 over time, data on management cost	Evidence collection and review from literature (PAFs, biodiversity spending under EU instruments, national budgets) Views from targeted interviews on adequacy of funding
	Action 3: Increase stakeholder awareness and involvement and improve enforcement. 3a: communication campaign by 2013, 3b: improved cooperation with key sectors and guidance documents developed, 3c: enforcement of Nature Directives through training on N2000 for judges and public prosecutors	SEBI 26: Familiarity with the term biodiversity / Awareness of the Natura 2000 network / Eurobarometer surveys of Europeans' attitudes to the Environment (2010, 2013, 2015, 2019) Communications campaigns Guidance documents for key sectors Training of judges and public prosecutors	Evidence collection and review from literature Review of communications campaigns (Natura 2000 awards, Natura 2000 day etc.) Views from targeted interviews with key sectors on whether and how they have been engaged. Eurobarometer surveys, AP for nature, people and the economy
	Action 4: Improve and streamline monitoring and reporting (4a: by 2012 new EU bird reporting system, 4b: by 2012 dedicated IC tool)	Art. 12 and Art. 17 reports (EEA), Streamlined reporting	Evidence collection and review from literature Case studies: survey questions and interviews on monitoring and reporting EEA State of Nature 2020, Member States reporting

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
	Action 5: Map and assess ecosystems and their services in the EU; promote the integration of their value into accounting and reporting systems across Europe	MAES methodological framework - indicators SEBI 4: Ecosystem coverage MAES Barometer	Evidence collection and review from literature Case studies in the Member States MAES methodological framework, Ecosystem assessment KIP/INCA, Narrative and MS examples on valuation of ecosystem services, Natural capital accounts
	Action 6: Restore ecosystems, maintain their services and promote the use of green infrastructure. 6a:develop strategic framework to set ecosystem restoration priorities, 6b: EC develop GI Strategy by 2012 to promote deployment of GI.	MAES EU ecosystem assessment Restoration prioritisation frameworks (national, regional) Restoration activity in the EU. GI Strategies, plans and investments (local to national, cross-border). EU financial instruments support for Green Infrastructure and restoration.	Evidence collection and review from literature OPC Interviews with EU level stakeholders, survey and interviews with competent authorities and stakeholders in the Member States (case studies)
	Action 7: Assess the impact of EU funds on biodiversity and investigate the opportunity of a compensation or offsetting scheme to ensure that there is no net loss of biodiversity and ecosystem services. 7a: EC to develop a methodology to assess impact of EU-funded projects, plans and programmes on biodiversity by 2014, 7b: EC propose by 2015 initiative to ensure no net loss of ecosystems and their services	Methodology for assessing the impacts of EU-funded projects, plans and programmes on biodiversity (biodiversity proofing) and its use EU level tools to encourage no net loss of ecosystems and their services (EU guidance).	Evidence collection and review from literature Interview/survey questions on perceived needs and impacts. Biodiversity proofing framework and sector-specific guidance; EU guidance on integrating ecosystems and their services, NNL
	Action 8: Enhance CAP direct payments to reward environmental public goods such as crop rotation and permanent pastures; improve cross-compliance standards for GAEC (Good Agricultural and Environmental Conditions) and consider including the Water Framework in these standards. 8a: CAP direct payments reward the delivery of public environmental goods that go beyond cross-compliance. 8b: Improve and simplify the GAEC cross-compliance standards.	CAP direct payments which reward environmental public goods beyond cross compliance. Simplified GAEC standards.	Evidence collection and review from literature Interviews/survey questions on uptake of such payments and the implementation of simplified GAEC. Evaluation of CAP impacts on biodiversity, water and soil, Evaluation of CAP direct payments, ECA reports
	Action 9: Better target Rural Development to biodiversity needs and develop tools to help farmers and foresters work together towards biodiversity conservation. 9a: integrate quantified biodiversity targets into Rural Development strategies and programmes. 9b: EC and MS establish mechanisms to facilitate collaboration between farmers and foresters	Data on uptake of quantified biodiversity targets RDP Existence of mechanisms to facilitate collaboration between farmers and foresters.	Evidence collection and review on quantified biodiversity targets in RDP and mechanisms available. Expert opinion from interviews/surveys to ascertain which mechanisms have aided cooperation and helped to protect biodiversity.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
	Action 10: Conserve and support genetic diversity in Europe's agriculture	SEBI: 006 Livestock genetic diversity: Evolution of native population sizes and endangered breeds (cattle) Uptake of agri-environmental measures in agriculture management plans	Evidence collection and review from literature Interviews/surveys with MS ie. "what measures have been implemented within your MS to support genetic diversity in agriculture?"
	Action 11: Encourage forest holders to protect and enhance forest biodiversity. 11a: MS and EC will encourage adoption of management plans. 11b: MS and EC will foster innovative mechanisms to finance the maintenance and restoration of ecosystem services provided by forests	% of forests which have management plans. Expert opinion on the impact of the Biodiversity Strategy in encouraging the uptake of management plans by forest holders. Existence of innovative finance mechanisms used by MS to enhance forest biodiversity.	Evidence collection and review - predominantly on EU-funded programmes and projects on forest biodiversity, Interviews/surveys with MS and actors responsible for forest management to ascertain the scale of inclusion of biodiversity measures in management plans, and to gain an understanding of use of innovative financing mechanisms
	Action 12: Integrate biodiversity measures such as fire prevention and the preservation of wilderness areas in forest management plans	-	Evidence collection and review at national level Interviews/surveys with MS CAs to estimate the scale of adoption.
	Action 13: Ensure that the management plans of the Common Fisheries Policy are based on scientific advice and sustainability principles to restore and maintain fish stocks to sustainable levels. 13a: Maintain and restore fish stocks to levels that can produce MSY in all areas which the EU fleet operates. 13b: Develop and implement management plans with harvest control rules based on MSY. 13c: Improved data collection on MSY, which are used to guide ecological considerations in the definition of MSY by 2020.	MSY thresholds surpassed in each fishing zone Number of stocks where rate of fishing is known against MSY rate per fishing region Number of stocks fished at the MSY rate per regional fishing area Fish stocks depleted within European fleet operation areas. Data availability on MSY. Number of multi-annual fishing plans.	Evidence collection and review from literature Interviews/surveys to understand fish stock state in MS. Expert opinion on the integration of scientific advice within CFP.
	Action 14: Reduce the impact of fisheries by gradually getting rid of discards and avoiding by-catch; make sure the Marine Strategy Framework Directive is consistently carried out with further marine protected areas; adapt fishing activities and get the fishing sector involved in alternative activities such as eco-tourism, the monitoring of marine biodiversity, and the fight against marine litter. 14a: EU will design measures to eliminate discards and avoid by-catch in order to preserve vulnerable marine ecosystems. 14b: Financial incentives provided for fisheries and maritime policy for marine protected areas.	Marine Protected Area network Conservation status of species in marine ecosystems Conservation status and trends of marine habitats Status assessment of natural features reported by EU MS under the Marine Strategy Framework Directive (MSFD) Number of EU Red Listed Marine Fish Status of marine fisheries stocks Evidence of measures implemented to tackle discards, by-catch and conservation of marine ecosystems. Finance provided to enhance marine ecosystems.	Evidence collection and review from literature Expert opinion to complement (triangulation) - interviews with MS competent authorities on the effect of measures implemented to combat adverse impacts on fish stocks, species, habitats and ecosystems. Interviews/surveys with stakeholders on financial incentives available for fisheries and maritime policy.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
	Action 15: Make sure that the EU Plant and Animal Health legislation includes a greater concern for biodiversity by 2012.	Biodiversity provisions within EU Plant and Animal Health legislation since 2012	Evidence collection and review from literature Follow-up surveys/interviews to gain an understanding of the impact of this
	Action 16: Provide a legal framework to fight invasive alien species by providing a dedicated legislative instrument by 2012.	Number of IAS of Union concern. Existence of a dedicated legislative instrument on IAS since 2014.	Evidence collection and review from literature Follow-up surveys/interviews to gain an understanding of the impact of this
	Action 17: Reduce the impacts of EU consumption patterns on biodiversity and make sure that the EU initiative on resource efficiency, our trade negotiations and market signals all reflect this objective. 17a: the EU will take measures to reduce biodiversity impacts of EU consumption patterns. 17b: The potential negative impacts of trade policy on biodiversity will be identified and evaluated through ex-ante trade sustainability impact assessments and ex-post evaluations, and a chapter on sustainable development will be included with provisions of importance of trade on biodiversity goals will be provided. 17c: Market signals for biodiversity conservation will be provided by MS and the Commission (including harmful subsidies).	SEBI 017: Forest, growing stock, increment and fellings Impact of EU decisions on species trade or status of species in trade Evidence of biodiversity assessments present within trade agreements, and the impacts of such trade policies on biodiversity.	Evidence collection and review from literature on the impacts of EU consumption patterns, and the trends of these impacts. Trade agreement review- particularly on sustainable development chapters within. Review of literature on market signals and instruments within the EU related to biodiversity conservation. Interviews/targeted survey to understand the impacts of trade policy inclusion of sustainable development chapters and to uncover existence of market signals present within MS. Trade agreements, PINES data Expert opinion on resource impacts on biodiversity and existence of harmful subsidies which impact biodiversity.
	Action 18: Target more EU funding towards global biodiversity and make this funding more effective. 18a: The Commission and MS will increase their contribution to global biodiversity as part of global process aimed at estimating biodiversity funding needs and adopting resource mobilisation targets. 18b: The Commission will improve the effectiveness of EU funding for global biodiversity through supporting natural capital assessments, National Biodiversity Strategies and Action Plans, improving coordination within the EU and with non-EU donors in implementing biodiversity assistance/projects.	Evidence of MS/EU funding provided to combating biodiversity loss Biodiversity-related international/EU financial flows Projects funded under EU instruments.	Evidence collection and review from literature Interviews/ targeted surveys with MS CAs to understand the scale of MS funding towards global biodiversity conservation, existence of natural capital assessments Biodiversity Strategies and Action Plans, and coordination with non-EU donors. Literature review to review EU funding for global biodiversity scale and impacts.
	Action 19: Systematically screen EU action for development cooperation to reduce any negative impacts on biodiversity, and undertake SEAs and EIAs for actions likely to have significant effects on biodiversity	Assessments of the impact of EU development cooperation on biodiversity.	Evidence collection and review from literature on assessments screening effects of actions on biodiversity Expert opinion on actions which are likely to result in significant impacts on biodiversity.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
	Action 20: Make sure that the benefits of nature's genetic resources are shared fairly and equitably, propose legislation to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation in the EU so that the EU can ratify the protocol by 2015.	EU legislation to implement the Nagoya protocol by 2014.	Evidence collection and review from literature, Targeted survey/ interviews to estimate impacts
1.3 To what extent has the strategy been successful in addressing the main *drivers* of biodiversity loss at the EU and at the global levels?	This evaluation question mostly relates to the headline target: "Headline Target: 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" and will be applied to the Evaluation Strategy as a whole.	Landscape fragmentation pressure from urban and transport infrastructure expansion - EEA CSI 054 (Target 2) Frequency of pressures and threats on marine habitat types and species (Target 4) Artificial land cover per capita (Target 2, Action 5) Impact of EU decisions on species trade or status of species in trade (Target 6, Action 17b)	Evidence collection and review from literature to map efforts vis-à-vis the main drivers of biodiversity loss in the EU. Interviews/ targeted surveys to identify drivers, pressures and impacts which reoccur throughout MS and sectors. Each of these drivers, pressures and impacts will be required to be mapped against each target. List of drivers and pressures which have impacted biodiversity loss and the degradation of ecosystem services, and expert opinion of the relative success of the strategy in addressing these issues.
Evaluation question 2: What have been the major achievements of the Strategy, and the causes of these achievements?			
2.1 What are the most significant achievements at the EU, national and sub-national levels?	All Targets	A combination of biophysical indicators from above List of major achievements of the Strategy, related to each Target.	Evidence collection and review from literature Interviews with EU-level organisations and stakeholders in the Member States (case studies) to gain insights from implementation.
2.2 What success factors can be identified? Have successful approaches been shared and replicated?	All Targets	List of factors which have led to the major achievements identified as part of sub question 2.1, for each target	Evidence collection and review from literature to uncover best practice examples of achieving targets. Interviews/ targeted surveys with MS and EU-level stakeholders to identify key success factor, per target. In addition to this, stakeholders will be asked to provide details on cooperation with other MS and sharing of best-practice. OPC questions on significant contribution by sectors, factors of success, challenges and obstacles in relation to each target.
Evaluation question 3: Where the Strategy has failed to achieve one of its objectives, what have been the contributing causes?			

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
3.1 What challenges, barriers and root causes of failure have hindered progress towards the targets ***at EU level***, including in relation to financing, knowledge and awareness, governance and capacity, as well as in relation to the wider socio-economic context including possible market and regulatory failures or behavioural biases?	All targets	A combination of biophysical indicators (when applicable) could be used to help identify where gaps to achieving objectives exist. Assessment of available data to inform a reliable assessment of performance against the targets, and consideration of key gaps in knowledge that prevent a rigorous assessment of performance against targets. List of key information gaps, barriers and drivers which lead to failure in achieving targets at EU level.	Evidence collection and review from literature Interviews with EU-level organisations and MS authorities (" What are the key challenges faced in achieving the targets established in the Biodiversity Strategy to 2020?") OPC questions on significant contribution by sectors, factors of success, challenges and obstacles in relation to each target; and on needs for further EU actions. Targeted interviews with EU stakeholders for specific examples at EU level.
3.2 What key gaps, challenges, barriers and root causes of failure have hindered ***the EU Member States*** from achieving the targets individually, including in relation to financing, knowledge and awareness, governance and capacity, as well as in relation to the wider socio-economic context including possible market and regulatory failures		A combination of biophysical indicators (when applicable) to be used to help identify where gaps to achieving Targets exist.	As above, for MS-level applicable answers: case study documentation, interviews, survey List of key implementation gaps, information gaps, barriers and drivers which lead to failure in achieving targets at MS level

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
or behavioural biases?			
3.3 Has the Strategy produced any unintended consequences?	Headline Target and all individual targets and horizontal measures	-	Evidence collection and review from literature For all targets, OPC questions on any significant positive/negative impacts on sectors resulting from the Strategy's implementation, and on significant avoidable administrative burdens that have arisen from the strategy's implementation. MS case studies will also be utilised to unearth further evidence of unintended consequences. Expert opinion from interviews and targeted surveys
Evaluation question 4: To what extent have stakeholders been actively engaged in the strategy's implementation?			
	The Strategy as a whole	*Indicators for Strategic Measure 3*	Evidence collection and review from literature Interviews with MS, experts and key sectoral stakeholders on their involvement in the Strategy's implementation. *Stakeholder sectors:* • *Civil society* • *Agriculture sector* • *Fishing / aquaculture sector* • *Forestry* • *Protected area managers* • *Finance sector* • *Spatial planners* • *Academia*
Efficiency			
Evaluation question 5: To what extent has the strategy been cost-effective?			

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
5.1 What are the costs incurred in delivering the Strategy?	All Strategy and individual targets and actions	Estimated costs for: - N2000- management, establishment of sites, investment costs, monitoring costs, maintenance costs - ecosystem restoration. Costs of implementing the EU Strategy on Green Infrastructure. Costs of monitoring ecosystem health (MAES) - Proportion of budget dedicated to greening measures under the CAP. Transaction costs associated with greening measures under the CAP - Developing Forest Management Plans (or equivalent) and Opportunity costs of FMPs on forestry production value - Establishing MSY in a fishery. - Costs of measures to achieve MSY (Programmes of Measure, policy implementation, management measures) - Opportunity costs of MSY in fisheries. - Prevention and management of IAS in the EU for IAS of Union concern. - EU's international biodiversity flows	Evidence collection and review from literature on cost estimations of all types of costs. Where insufficient, interviews with authorities and stakeholders to identify further sources of information on country-specific costs.
5.2 What are the benefits produced by the Strategy and how do they compare to the costs?	All Strategy and individual targets and actions	Total economic benefits compared against the costs, provided by N2000 areas, maintenance and enhancement of ecosystems and their services, CAP greening and biodiversity support measures under the AECM, integration of biodiversity measures in forest management plans and implementation, healthy fisheries and marine ecosystems, IAS prevention and control, and global biodiversity.	Evidence collection and review from literature on benefits (qualitative and quantitative, and where possible, monetised) from implementation. Distinction made between potential (estimated) and realised benefits. Where insufficient, interviews with Member States authorities and stakeholders. OPC questions on costs and benefits
5.3 How timely and efficient is the process for reporting and monitoring?	All targets	Reporting and monitoring obligations, processes and administrative burden.	Evidence collection and review from literature on the monitoring and reporting arrangements under the Strategy and links to national reporting to the CBD. Literature review on the integration and open access of biodiversity monitoring and reporting data into relevant EU legislation (CAP, CFP, etc.). Interviews with EU agencies, Member States authorities and other stakeholders on the common implementation framework (CIF) and time spent on monitoring and reporting. Case studies to explore country specific reporting and monitoring requirements.
5.4 What factors could have	All targets	For general cost-effectiveness: List of factors that minimise funding needs identified in evaluation question 5.1 while improving or not	For general cost-effectiveness: Interviews with key stakeholders to identify views on how to reduce costs and

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
improved the cost-effectiveness by strengthening delivery of the targets while minimising unnecessary costs and avoiding administrative burden?		affecting the delivery of the benefits of each of the targets, identified in evaluation question 5.2. For administrative burden: List of factors which can improve the delivery of each of the targets while minimising monitoring and reporting requirements, identified in evaluation question 5.3.	maximise benefits. Subsequent analysis to derive a list of factors. For administrative burden: Interviews with key stakeholders for monitoring and reporting to collect views on needs for improvement. Case studies on Member States monitoring and reporting of national strategies and EU targets.
Evaluation question 6: Was the Strategy the most appropriate instrument to achieve the EU biodiversity targets to 2020?			
6.1 What types of alternative instruments could have been considered for implementation?	Targets 1-6	Overview of existing instruments at EU and MS levels (strategies, plans, programmes, guidance documents, monitoring and assessment methodologies and frameworks, funding instruments, coordination structures) for implementation of the Nature Directives, ecosystem restoration, green infrastructure deployment, biodiversity-proofing EU budget and ensuring No Net Loss; for the integration of biodiversity considerations in sector policies, combatting IAS and instruments to support global biodiversity. Overview of potential alternative instruments.	Evidence collection and review from literature on instruments used by MSs or non-EU countries. Interviews with key stakeholders related to the implementation of each target. Case studies on implementation of EU instruments in the Member States as well as national instruments. Overview of existing instruments and reflection on their effectiveness and alternative instruments
6.2 What would have been the pros and cons of alternative options, compared to the selected strategy?	All targets	List of pros and cons for each of the alternative instruments identified in evaluation question 6.1 for each target separately.	Assessment of the potential benefits (including cost savings) offered by, as well as potential costs (including foregone benefits) and administrative burden that could arise from, alternative instruments identified in evaluation question 6.1 for each target separately and comparison of these benefits with the benefits identified under the currently used instruments. (Link to evaluation questions 5.2-5.4)
Evaluation question 7: What have been the socio-economic impacts of the strategy?			
7.1 What significant positive and/or negative socio-economic impacts has the strategy implementation had (including costs entailed as well as benefits arisen for	All targets	Overview of positive and negative socio-economic impacts per target.	Comparison of benefits or costs identified in evaluation question 5.2 complemented by a literature review to identify, to the extent possible, information on employment for each stakeholder type, aesthetic and amenity values of ecosystems, and health and quality of life impacts per target. OPC questions on wider positive and negative impacts of implementation (environmental as well as socio-economic)

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
different stakeholders)?			Interviews with key stakeholders in different sectors at the EU level and in the Member States.
7.2 What have the main socio-economic impacts been, within the EU and globally, of any identified failure to achieve the EU biodiversity targets?	All targets	Overview of socio-economic impacts resulting from the failure to achieve aspects of each target.	Analysis of costs of continued biodiversity degradation for different actors and of lost benefits derived from failure to progress towards the targets.
Relevance			
Evaluation question 8: To what extent do the targets of the strategy (still) correspond to the current needs of the EU with regard to biodiversity?			
8.1 What needs were identified at the time the strategy was developed?	Strategy as a whole and individual targets	Indicators and datasets relating to habitats, species and sites of the Nature Directives, different ecosystem types, threats to biodiversity ecosystem services, and soil biodiversity, as described in the EU 2010 Biodiversity Baseline. Quantitative and qualitative indicators evidencing needs.	Analysis of the biodiversity needs set out in the EU 2010 Biodiversity Baseline (EEA, 2010), as well as the Strategy documents and impact assessment. Quantitative indicators evidencing needs; however, much of the analysis will be qualitative, assessing the logical link between the strategy and the needs it addresses, and the continuing relevance of the strategy with reference to any changes in identified needs.
8.2 How did the strategy link these needs to the targets defined?			The impact assessment accompanying the Strategy (2011) articulates how the Strategy sought to address the identified needs and hence the intervention logic for the strategy targets and actions.
8.3 Were these links clear, logical and evidence based?			Qualitative judgement, drawing on analysis of the logic and evidence underpinning the Strategy, and supplemented by review of published literature and stakeholder interviews.
8.4 How have the needs relating to biodiversity changed or evolved since the strategy was published?		Indicator sets updated since 2011 (e.g. SEBI, State of Nature, MAES, SOER), mid- term evaluation and other analyses provide evidence of evolving needs and major developments (new scientific evidence, increasing or decreasing pressures, technological advances etc.).	Review of literature to identify major developments and comparative analysis, complemented by stakeholder interviews at the EU and Member States' levels and OPC responses.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
8.5 Do the strategy targets remain relevant to these changing needs?			
Evaluation question 9: Has the strategy been flexible enough to respond to new or emerging issues?			
9.1 What new or emerging issues have been identified since 2010?	Strategy as a whole and individual targets and actions.	New or emerging issues identified through Question 8 above.	Identification of new or emerging issues from literature review, case studies and stakeholder interviews, drawing on indicators and analysis in question 8 above.
9.2 Have the strategy targets and actions been sufficiently flexible to address these issues?			Qualitative analysis of flexibility of the strategy to address new or emerging issues, including examples and stages of addressing new issues. Analysis of new initiatives (e.g. EU Action plan for nature, people and the economy, EU Pollinators Initiative) and how they with the strategy. Desk-based analysis will be informed by literature review and views and examples provided by stakeholders.
9.3 Are there examples where the strategy and actions to deliver it have been able to respond to new or emerging issues?			
9.4 Are there examples where the strategy and actions to deliver it have been unable to respond to new or emerging issues?			
Evaluation question 10: How relevant is the strategy for addressing the needs and interests of different stakeholders and for EU citizens?			
10.1 Which types of stakeholders and citizens have interests in the strategy or are likely to have been affected by it?	Stakeholder needs with respect to biodiversity, as well as specific needs relevant to individual targets (e.g. farmers for target 3 and fishermen for target 4)	Quantitative indicators relevant to stakeholder needs (e.g. fish stocks, ecosystem services) Qualitative analysis of needs.	Identification of most relevant stakeholder groups (land owners and managers, businesses/ developers, workers, local communities, visitors, ecosystem service beneficiaries, consumers) Mostly qualitative analysis; online public consultation provides some quantitative evidence regarding stakeholder views. Triangulation of stakeholder views with evidence from literature and desk-based analysis.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
10.2 What are the needs and interests of these different groups?			Identification of stakeholder interests through literature/ document review – including stakeholder position statements and submissions on biodiversity related issues Mapping of stakeholders against each target as well as strategy overall
10.3 Does the strategy identify and seek to address these needs and interests?			Analysis of strategy and evidence of implementation to examine extent to which needs are addressed (including Nature Directives fitness check and other evaluations). Analysis supplemented by evidence from case studies and stakeholder views.
10.4 Has the strategy helped to address these needs and interests in practice?			Evidence of strategy addressing particular stakeholder needs (e.g. delivering ecosystem services, contributing to land manager incomes) from literature review, case studies and stakeholder consultations
10.5 What are the views of stakeholders regarding the relevance of the strategy in addressing their needs and interests?			Analysis of stakeholder views (interviews and OPC) on whether strategy meets their needs
Coherence			
Evaluation question 11: To what extent is the EU Biodiversity Strategy coherent with the Europe 2020 Strategy for smart, sustainable and inclusive growth?			
11.1 Are the overall priorities and objectives in the two strategies complementary?	Strategy and its targets and actions overall.	Smarter, greener, more inclusive? Indicators to support the Europe 2020 strategy — 2019 edition	Coherence assessed with respect to EU 2020 objectives of Smart growth: innovation, education, digital society Sustainable growth: Climate, energy and mobility Inclusive growth: Employment and skills. Fighting poverty Mapping of Europe 2020 priorities and objectives (and Flagship Initiatives) and EU Biodiversity Strategy targets and actions to identify specific links and coherence. Look for and analyse examples in literature, Member State case studies, and stakeholder consultations. This takes into consideration the analysis in F8 of socio-economic impacts and in R10 of stakeholder needs.
11.2 Do the two strategies make explicit links to one another?			
11.3 Are there examples where the EU Biodiversity Strategy targets and actions have been			

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
in conflict with those in the Europe 2020 Strategy?			
Evaluation question 12: To what extent does the strategy support other EU environmental policy objectives, for example, in relation to clean air and water, the marine environment, the transition to a circular economy, sustainable production and consumption, soil protection, sustainable land use and management, waste management and the sustainable use of resources? What are the synergies or overlaps?			
12.1 What are the other objectives of EU policy?	Linkages between each target and the EU environmental objectives set out in the 7EAP.	N/A Wider environmental indicators (e.g. in State of the European Environment report) are relevant, although unlikely to give specific evidence of the contribution of the strategy.	Quantitative EU environmental policy objectives Analysis of non-quantified objectives, e.g. Clean air (NEC), Water (WFD and MSFD), Circular economy Sustainable production and consumption (7EAP and waste legislation). Link to evaluation 13
12.2 To what extent can the EU Biodiversity Strategy targets and actions be expected to contribute to each of these objectives?			Assessment of linkages (contribution/ potential conflict) between biodiversity/ ecosystems and EU environmental objectives (e.g. effects of forest conservation on air and water quality, climate) Evidence from literature review and from stakeholder consultations. Link to EQ 8 and EQ 2
12.3 Are there examples where actions taken under the Strategy have contributed to, or hindered, the delivery of these objectives?			Literature review, stakeholder interviews and online consultation to identify examples of conflict and contribution. Key sources: Nature fitness check, green infrastructure studies, IAS studies, evaluations of CAP and fisheries policies, evaluations of other policies (e.g. WFD)
12.4 Are there examples of actions contributing jointly to biodiversity and other environmental policy objectives?			
Evaluation question 13: To what extent are the biodiversity targets coherent with, and mainstreamed into, other EU policies, in particular on agriculture, forestry, fisheries, regional and urban development, infrastructure (in particular transport, energy and environmental infrastructure, ports and mining), tourism, climate mitigation and adaptation, research and innovation as well as trade and development cooperation?			
13.1 Which targets and actions in the strategy are relevant to these other EU	Strategy and its targets and actions overall, while identifying where specific targets or actions contribute to or detract from coherence - according to their relevance for the sectors (link to R8 and R9)	N/A – reference to the evidence from the effectiveness questions	Map EU Biodiversity Strategy targets against EU policy objectives of the following: CAP (2007-2013 and 2014-2020) EU Forest Strategy & Multiannual Implementation Plan

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
policies?			CFP (2007-2013 and 2014-2020) EU Cohesion Policy (ERDF, ESF and Cohesion Fund) EIA, SEA and ELD Water Framework Directive Floods Directive Marine Strategy Framework Directive Maritime Spatial Planning Directive Green Infrastructure strategy EU Energy Union Strategy TEN-E, Commission fracking recommendation[251] RED and REDII EU Strategy on Adaptation to Climate Change National Emissions Ceiling Directive (NEC) EU Transport White Paper[252], TEN-T Commission Raw Materials Initiative (2011) 7th Framework Programme for Research (FP7) (2007-2013) and Horizon 2020 (2014-2020) Commission communication on tourism (2010)[253] Some of these policies have been modified or renewed during the EU Biodiversity Strategy implementation, so evaluation takes account of programming periods (e.g. CAP 2007-2013 and 2014-2020) Analysis of the targets and actions based on mapping Literature review and stakeholder views
13.2 Are the biodiversity targets and actions consistent with EU policy objectives in these areas?			
13.3 Are there examples of conflicts between EU biodiversity targets and actions, and these other EU policy objectives?			Step 1: identify types of conflicts that might occur (e.g. Natura 2000 holds back growth by restricting development) Step 2: look for and analyse examples of these. Examples identified from the literature, Member State case studies, and stakeholder consultations
13.4 Are the biodiversity targets referenced in these other EU policies?			Analysis of policies, reviews of operational programmes, RDPs etc. Level at which references are made (e.g. broad objectives, specific measures)

[251] Commission Recommendation on minimum principles for the exploration and production of hydrocarbons (such as shale gas) using high-volume hydraulic fracturing (2014/70/EU).
[252] White Paper: Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system (COM/2011/144 final).
[253] Europe, the world's No 1 tourist destination – a new political framework for tourism in Europe (COM/2010/0352 final).

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
13.5 Are the EU biodiversity targets effectively mainstreamed into these other EU policies, or are there examples of action in pursuit of other EU policies which conflicts with them?			Analysis of mainstreaming building on the evidence from C13.4 but also considering mainstreaming of individual targets or actions. Examples of conflicts identified from the literature, Member State case studies, and stakeholder consultations.
Evaluation question 14: To what extent is the strategy aligned with the EU's international commitments under the Convention on Biological Diversity (Aichi Targets), the Sustainable Development Goals and the United Nations Framework Convention on Climate Change?			
14.1 What are the EU's commitments under the CBD (Aichi targets), SDGs and UNFCCC?	Overall set of targets and actions and how they link with international commitments, as well as the alignment of specific targets with international commitments	Common indicators used for SDG and Biodiversity Strategy implementation	Review of CBD strategy and Aichi targets, SDGs and UNFCC to identify commitments under each
14.2 How and to what extent can the strategy be expected to contribute to these commitments?		-	Map the EU Biodiversity Strategy Targets to the Aichi Biodiversity Targets and the SDGs, to identify linkages and differences between them. Analysis of literature and stakeholder views. E.g. The impact assessment accompanying the Strategy (2011) articulates how the Strategy sought to address the identified needs and hence the intervention logic for the strategy targets and actions.
14.3 Does the strategy explain how it will contribute to these commitments?			
14.4 Are there are any significant gaps or inconsistencies between the strategy and these commitments?		-	Identification of potential gaps and inconsistencies, based on comparative analysis of strategy and international commitments, supplemented by literature review and stakeholder interviews.
EU added value			
Evaluation question 15: What is the added value resulting from the EU Biodiversity Strategy compared to what is likely to have been achieved by the Member States in its absence?			

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
15.1 In how far did the adoption of the EU Biodiversity Strategy to 2020 influence the adoption of concrete commitments by Member States?	Target-by-Target analysis of the influence of the Biodiversity Strategy on measures and/or commitments by Member States.	List of measures implemented by Member States which relate to each target, and are attributable to the Biodiversity Strategy. List of commitments with tangible relevance to the Biodiversity Strategy, for each target.	National data on biodiversity measures and commitments undertaken, in relation to each target. Interviews and surveys with Competent Authorities to elicit an understanding of measures/commitments undertaken since the adoption of the Biodiversity Strategy, and the perceived influence of the Strategy on the adoption of the adoption of these measures and commitments. As such, data predominantly derived from the MS case studies throughout this study.
15.2 Would the same target set at Member State level have been adopted in case of absence of the EU Biodiversity Strategy?	All targets and the headline target.	Overview of biodiversity-related targets established, and projected to be established, by MS in the absence of the Biodiversity Strategy. Aichi global biodiversity targets.	National biodiversity targets, considering also obligations under the CBD. Interviews and surveys with competent authorities to elicit an understanding of influence of the EU Biodiversity Strategy. As such, data predominantly derived from the case studies throughout this study.
15.3 Is there any evidence for increased ambition in response to the adoption of the EU Biodiversity Strategy?	All targets and the headline target.	Overview of biodiversity-related targets established by MS prior to the implementation of the Biodiversity Strategy.	Evidence from literature on increased ambition since the adoption of the Biodiversity Strategy. Evidence of attributability to the Biodiversity Strategy (or global framework). MS state data on biodiversity measures and commitments undertaken since the adoption of the Biodiversity Strategy. Interviews and surveys with Competent Authorities to elicit an understanding of the levels of ambition (primarily related to targets established, the scale of such targets, and their relationship with drivers/pressures) since the adoption of the Biodiversity Strategy.
15.4 Is the EU Biodiversity Strategy considered of key importance for the implementation of Member States NBSAPs, i.e. by facilitating the mobilization of financial resources or securing political	All targets and the headline target.	Perceived importance of the Biodiversity Strategy in the development and implementation of NBSAPs.	Literature to observe evidence of the Strategy in adding value to NBSAPs. Case studies (interviews and surveys) to reveal added value of the Strategy within the NBSAP process.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
commitment and public awareness?			
15.5 Would progress in implementation of Member States NBSAPs to date likely be the same in the absence of the EU Biodiversity Strategy? Why or why not?	Headline target, and some relevance to address at a target/sector level.	-	Interviews and surveys in the Member States (case studies). Identification of key factors which have improved/ negatively affected the implementation of NBSAP.
15.6 How adequate and effective is the Biodiversity Strategy in unifying divergent interests across the EU?	Strategy as a whole.	-	Literature for commentary and evidence of success or otherwise. Stakeholder views from interviews and surveys on the impact of the Strategy in aligning interests. Identification of areas of interest which are not adequately addressed in the Strategy, potentially leading to negative impacts on unifying interests.
Evaluation question 16: How do Member States' targets add up or compare to the targets at EU level?			
16.1 Did Member States align their biodiversity targets with the EU and the global targets?	All targets of the Strategy (individually).	-	Review of national policy documents Stakeholder views from interviews and surveys on the process of mapping their biodiversity targets.
16.2 In how far do Member State's targets differ from the EU targets, in particular regarding the level of ambition?	All targets of the Strategy (individually).	Level of ambition of MS biodiversity-related targets, compared to EU-level ambitions.	Literature review to compare the levels of ambition between MS targets and the targets of the Strategy.
16.3 In how far have the EU targets been used as a guiding framework for the development	Strategy as a whole.	-	MS interviews and surveys to ascertain the impact of the Strategy on providing frameworks for MS-level targets.

Relevant sub-questions	Relevant Biodiversity Strategy Component	Indicators	Tools to derive information
of (SMART) targets by Member States?			
16.4 What are concrete actions that Member States committed to by 2020?	All targets established in the Strategy (individually).	Identification of actions that MS are committed to.	Literature review and MS interviews/surveys to identify the actions MS are committed to by 2020.

ANNEX 4 – OVERVIEW OF COSTS – BENEFITS IDENTIFIED IN THE EVALUATION

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
Costs and benefits from the implementation of Target 1 ***Costs include:*** compliance costs: direct management activities including restoration, opportunity costs from alternative economic developments of Natura 2000 areas, administrative burden of compliance with the Directives, damages caused by protected species (e.g. large carnivores). ***Benefits include:*** improved biodiversity; flow of ecosystem services from the protected and restored sites; jobs and economic activities linked to Natura 2000 *Note: EU-wide figures are estimates: the MS are not obliged to report costs under the Nature Directives. Costs and benefits are largely linked to the Nature Directives' implementation. It was not possible to identify what part is exclusively attributable to Target 1*	Unknown but likely low costs related to limited recreational access or activities in some protected areas, or possible ecosystem disservices. (Public spending is indicated under "administrations") High benefits from ecosystem services such as climate change mitigation, health and recreation, food and water provision, education, preservation of the intrinsic value of biodiversity and its maintenance for future generations. Medium benefits from direct and indirect jobs and	Minimum value of benefits from a sub-set of ecosystem services from terrestrial Natura 2000 (climate change mitigation, recreation, food and water provision,) estimated at EUR 200-300 billion / year (in 2011 for EU-27 including UK / excluding Croatia). Natura 2000 stores around EUR 9.6 billion t of carbon, equivalent to 35 billion t CO2, worth between EUR 600 billion and EUR 1,130 billion. Carbon stocks per unit area of Natura 2000 are 43% higher than average across the EU.	Opportunity costs of varying scale and depending on context: limitations on economic activity and resource use; damages caused by protected species; modified activities (e.g. mowing regime or landscape elements on farmland). Benefits to fisheries and tourism from Marine Protected Areas. Direct and indirect jobs linked to Natura 2000: administration, monitoring, management and restoration, research, surveillance and environmental services.	Approximately EUR 2.1 billion annual costs (36% of total costs) for implementing the Natura 2000 network were compensation for opportunity costs-including compensation to business owners. Natura 2000 sites are estimated to support directly or indirectly around 52,000 jobs.	Low-to-medium investments from public budgets in protected areas. Medium-to-high administrative burden related to compliance. Access to funding is a major driver of delivery of the Natura 2000 benefits. Financing needs were probably not covered. Significant variations of costs-to-benefit ratio; implementation costs reasonable and outweighed by benefits.	Direct costs of management (needs) estimated at EUR 5.8 billion / year (in 2011); actual total spending over 2014 - 2020 estimated at EUR 25.5 billion based on PAFs, including EU and national funding allocations to actions and sub-measures for Natura 2000. MS reports to CBD show a consolidated spending (all costs) at ca. EUR 13 billion/year. Figures likely to at least partly include funding under the MFF.

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
	incomes linked to conservation measures.					
Costs and benefits from the implementation of Target 2 Costs include one-off costs of restoration; recurring costs of maintenance of restored ecosystems; opportunity costs from alternative uses of restored areas; administrative burden for strategic planning (RPF, GI strategies). Benefits include improved biodiversity, flow of ecosystem services from restored ecosystems, jobs in restoration, monitoring and research. *Note: There is no reporting obligation and no comprehensive overview of restoration actions and their costs in the EU.* *Benefits cannot be easily monetised due to lack of systematically collated evidence. Cost-effectiveness depends on context:*	Unknown but likely low costs related to disturbance and possible ecosystem disservices. Positive benefit-to-cost ratio of restoring ecosystem services of immense value such as crop pollination, carbon sequestration, outdoor recreation and flood protection[254,255], noise reduction, provisioning of clean air and water; health and mental benefits, social opportunities of access to nature, pollution mitigation and microclimate regulation in urban ecosystems.	No EU-wide estimate but very high value from restoring and maintaining ecosystems and their services: - Forest, wetlands and other ecosystem restoration has brought millions of EUR in savings from lower water retention and purification costs - urban green infrastructure can generate multiple benefits in the form of enhanced health and well-being - Estimated 15,000 to 110,000 direct jobs / year could be supported by investment to achieve Target 2.	Potentially significant opportunity costs from constraints on other land and resource use activities: up to 60% of the total cost / up to EUR 1.7 billion (not realised)[256]. Significant benefits from ecosystem services (pollination, soil formation, integrated pest management, water and climate regulation, resilience of terrestrial ecosystems, tourism and recreation resources). Potentially significant	Total economic activity associated with current level of restoration estimated at between EUR 11.5 and EUR 79.5 million (highly uncertain). Value of outdoor recreation was estimated at EUR 50 billion /year. The value of the direct contribution of insect pollinators to EU agricultural output has been estimated at around EUR 15 billion per year[257].	Low to medium costs to public budgets for restoration (the 15% target was not achieved) and GI. Minimal costs from MAES (essentially a research initiative) Benefits from MAES (knowledge for decision-making) Medium potential burden for developing restoration plans (not done in most Member States: only very few national or regional authorities submitted such plans).	One-off costs of 15% restoration (potential): EUR 9.6 billion / year (2013); cost of maintaining restored ecosystems: EUR 618 to EUR 1,660 million / year (not realised). Estimated total realised restoration expenditure in 2010-2020: EUR 4.8 million to EUR 33.1 million / year; figures highly uncertain. GI received ca EUR 915 million / year from EU funds 2014 - 2020. Database[258] of ca. 400 restoration projects in Europe[259] (2010 to 2020): ca

[254] Vallecillo et al. (2018). Ecosystem services accounting: Part I - Outdoor recreation and crop pollination, Publications Office of the European Union, Luxembourg.
[255] Vallecillo et al. (2019). Ecosystem services accounting. Part II - Pilot accounts for crop and timber provision, global climate regulation and flood control, Publications Office of the European Union, Luxembourg.
[256] Ecologic et al., (2011) Taking into account opportunity costs when assessing costs of biodiversity and ecosystem action.
[257] Gallai, N., et al,. (2009) Economic Valuation of the Vulnerability of World Agriculture Confronted with Pollinator Decline, Ecological Economics 68(3): 810-821.
[258] A searchable database of all the projects analysed is available online at www.restorationfunders.com
[259] UNEP-WCMC, FFI and ELP (2020) Funding Ecosystem Restoration in Europe: A summary of funding trends and recommendations to inform practitioners, policymakers and funders.

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
type of ecosystem, competing site uses, restoration approaches etc.			restoration services niche.			EUR 1.25 billion committed to restore 16 million ha of degraded terrestrial (85%) and freshwater and marine (15%) ecosystems across Europe[260].
Costs and benefits from the implementation of Target 3A *All Target 3A measures are implemented under the CAP.* *The total costs and benefits have not been comprehensively studied in the literature. Most benefits relate to employment and income generation from sustainable agricultural activities.*	The impact of direct payments on farmland biodiversity is low or unknown: the largest biodiversity-related investments have been made in the least effective measures from a biodiversity perspective (such as in areas of natural constraints).	Not available	Crop diversification and possibly permanent grassland ratio requirement under CAP greening may lead to lower farm income. Crop losses and damage from protected species can be locally significant. Low costs related to other measures (voluntary uptake).	Investing EUR 1 billion / year in agri-environment measures could create 6,600 additional jobs (FTE).	The administrative costs of the biodiversity instruments is considered to be proportionate, given the complexity of some measures. Two CAP measures with direct biodiversity impact have significant administrative burden: the AECM and greening (especially EFA). Some examples of disproportionate costs of biodiversity measures in Member States (Alliance Environnement 2019)	AECM accounted in 2017 for EUR 558-626m of the costs of managing and controlling the CAP. Greening accounted for a further EUR 166-186m. The costs of managing and controlling cross-compliance were estimated at EUR 130-152m (but other aspects than biodiversity account for most of it).

[260] Europe was defined as the 51 countries, territories and independent states within Europe, as defined by the Endangered Landscapes Programme.

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
Costs and benefits from the implementation of Target 3B Administrative costs and creation of jobs for the development of management plans for forests and the update of existing ones.	Exceptional values of intact forest ecosystems for biodiversity, climate mitigation and adaptation, reduced disturbance risk and public health benefits[261].	Potentially very significant socio-economic benefits from sustainably managed forests: timber provision was estimated to provide EUR 10,820/km^2 in the EU in 2012, whereas forest services such as climate regulation, flood control and nature-based recreation provided an estimated EUR 34,860/km^2).	Payments for ecosystem services for forest ecosystems restoration and maintenance has contributed only a minor amount to the income of forest owners.	The Natural Capital Financing facility leveraged up to EUR 150 million for forestry projects on payments for ecosystem services, green infrastructure, innovative pro-biodiversity and adaptation investment, and biodiversity offsets.	The main costs are related to the development and implementation of management plans for public forests and the update of existing ones to integrate biodiversity-related measures. Cost estimates of these measures could not be found but they are considered marginal.	1% of total RDP budget devoted to payment for ecosystem services. In the 2014–2020 period, 90% of RDPs included at least one forest-related measure amounting to a total of EUR 8.2 billion of public expenditure for forest measures (EAFRD + national/regional co-financing)[262]. Most of this was not invested in biodiversity.
Costs and benefits from the implementation of Target 4 Costs are related to implementing measures and investment in fishing equipment to reduce impacts on marine biodiversity; opportunity costs from limitations on marine economic activities; reporting and administrative burden for	The societal benefits provided by healthy oceans are very high (immeasurable) in preserving the intrinsic and cultural value of marine biodiversity, food provisioning (fish, algae and other sea		Fishing sector accounts for as many as half the local jobs in some coastal communities. MPA may cause opportunity costs due to fishing restrictions.	EU fishing fleet maintained high levels of net profits totalling EUR 1 billion in 2018, mainly as a result of the use of sustainable fishing methods[263]. Coastal and marine	Public budget measures to support sustainable fisheries and marine ecosystems' protection and restoration. Administrative burdens related to	EMFF funding to biodiversity is estimated at EUR 199 million in 2015, EUR 134 million in 2016, EUR 136 million in 2017[264], EUR 90 million in 2018 and EUR 128 million in 2019[265]. In

[261] https://www.nature.com/articles/s41559-018-0490-x
[262] EC (2018). Progress in the implementation of the EU Forest Strategy.
[263] STECF (2020) The 2019 Annual Economic Report on the EU Fishing Fleet (STECF 20-06), Scientific, Technical and Economic Committee for Fisheries.
[264] EY and Biotope (2017) Study on biodiversity financing and tracking biodiversity-related expenditures in the EU budget.
[265] European Commission (2020). FAME SU, EMFF implementation report 2019.

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
stakeholders and authorities to ensure compliance. *Note: maintaining and restoring fish stocks and achieving GES is mainly contributed through the Common Fisheries Policy (CFP) and the Marine Strategy Framework Directive (MSFD).*	food), maintaining the planet's capacity to mitigate and adapt to climate change, regulating the climate, protection from extreme weather, recreation and health.		Investments in marine biodiversity can generate high economic returns in enhanced yields, higher quality fish products, and tourism. No comprehensive overview of the costs and benefits of the actions related to Target 4 is not found in literature.	nature-based tourism employs over 3 million people and generates more than EUR 180 billion / year in the EU.	national and regional programming, monitoring and reporting.	2020, Member States committed a total of EUR 1,637 million of EMFF funding to measures that potentially contribute to the protection and restoration of biodiversity[266]. This only includes funding directed to measures for the protection and restoration of marine biodiversity. If broader measures are added that have the potential to contribute to biodiversity, the figures are significantly higher. In addition to the important role of the EMFF in supporting the Member States to reach Good Environmental Status, funding has also been available from the LIFE Programme, research and structural funds.

[266] European Commission (2020). FAME SU, EMFF implementation report 2019.

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
Costs and benefits from the implementation of target 5 Administrative costs, compliance costs, direct costs to affected parties in responding to the Regulation, and indirect costs (opportunity costs) from limitations on activities. Benefits concern avoided damage. *Note: Most Member States were not able to estimates of the implementation costs incurred by the IAS Regulation in the 2019 reports.*	Constraints to owning or growing IAS. Benefits of tackling IAS: avoided cost of damage to ecosystems, infrastructure, human, animal and plant health and agricultural losses. Likely highly cost-effective, net benefits will be increasing as the implementation advances.	Damages from IAS estimated to cost the EU at least EUR 12 billion / year. (2009 assessment, likely much higher now as IAS problem has steadily grown).	Opportunity costs from restrictions on the use of listed species of economic importance.	Cost-benefit analysis underpins each decision to place new species on the list of IAS of Union concern. Costs depend on management: e.g. continued commercial catches of red swamp crayfish *Procambarus clarkii* in Spain, where it reached up to 3000 tonnes of annual catch, contributing local fishermen's incomes.	Costs related to monitoring and control measures. Public investments in IAS control measures. Cost-effectiveness of preventative measures and early intervention far exceeds the costs-effectiveness of management of established IAS.	Costs of implementing the Invasive Alien Species Regulation estimated at around EUR 1.43 billion / year.
Costs and benefits from the implementation of Target 6 Costs include EU and MS budget spending on global biodiversity (resource mobilisation under CBD); administrative and compliance costs; and controls and inspections (in relation to trade).	Share of the employment that relies on ecosystem services varies significantly among regions, with Africa and Asia having the highest shares at 59% and 47% respectively. Main benefits include global	The global cost of inaction to halt biodiversity loss has been estimated at around US$4-20 trillion (EUR 3.5-17.5 trillion) per year in ecosystem services from 1997 to 2011. A conservative estimate of the total cost globally of	Benefits from natural resource conservation, restoration and sustainable use: potentially very high but no reliable methodology to assess impacts. Significant costs of compliance and opportunity costs	Not available, only individual examples in literature.	EU budget spending on resource mobilisation for global biodiversity, including Official Development Assistance, Instrument for Pre-accession Assistance, European Neighbourhood Instrument, Development	2011-2015: more than EUR 1 billion of total EU international biodiversity spending[267]. 2014-2020 (note overlap) estimated at more than EUR 2 billion (EU financial reporting to the Convention on Biological Diversity)

[267] EU support for sustainable use and conservation of nature in developing countries.

	Citizens/Consumers		Businesses and land and resource managers (farmers, foresters, fisheries)		Administrations	
	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary	Qualitative	Quantitative / monetary
	biodiversity preservation and the safeguarding of essential ecosystem services, improved livelihoods, mitigation of risks from global biodiversity loss (including emergence of pandemics).	subsidies that damage Nature is around US$4 to 6 trillion per year.	related to restrictions on trade.		Cooperation Instrument, Partnership Instrument for cooperation with third countries, European Development Fund. Proportionate costs to tackle wildlife trafficking Administrative burden of biodiversity provisions in TSD chapters of FTA.	One-off resources to build and develop capacity for the Nagoya Protocol between EUR 47 and EUR 270 million (2020 prices)[268]. EUR 340 million EU projects implementing wildlife trafficking-related actions in countries in Africa, Asia, and South America[269].

[268] CBD Technical Series No 78: Progress toward the Aichi Biodiversity Targets: An Assessment of Biodiversity Trends, Policy Scenarios and Key Actions, Secretariat of the Convention on Biological Diversity.
[269] Progress report on the implementation of the EU Action Plan against Wildlife Trafficking. (SWD/2018/452 final).

ANNEX 5 – OPERATIONAL TARGETS AND ACTIONS OF THE EU BIODIVERSITY STRATEGY TO 2020

Target 1: Fully implement the EU Nature Legislation (the Birds and Habitats Directives)

To halt the deterioration in the status of all species and habitats covered by EU nature legislation and achieve a significant and measurable improvement in their status so that, by 2020, compared to current assessments: (i) 100% more habitat assessments and 50% more species assessments under the Habitats Directive show an improved conservation status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status.

- **Action 1:** Complete the establishment of the Natura 2000 network and ensure good management

  1a) Member States and the Commission will ensure that the phase to establish Natura 2000, including in the marine environment, is largely complete by 2012.

  1b) Member States and the Commission will further integrate species and habitats protection and management requirements into key land and water use policies, both within and beyond Natura 2000 areas.

  1c) Member States will ensure that management plans or equivalent instruments which set out conservation and restoration measures are developed and implemented in a timely manner for all Natura 2000 sites.

  1d) The Commission, together with Member States, will establish by 2012 a process to promote the sharing of experience, good practice and cross-border collaboration on the management of Natura 2000, within the biogeographical frameworks set out in the Habitats Directive.

- **Action 2:** Ensure adequate financing of Natura 2000 sites

  The Commission and Member States will provide the necessary funds and incentives for Natura 2000, including through EU funding instruments, under the next multiannual financial framework. The Commission will set out its views in 2011 on how Natura 2000 will be financed under the next multi-annual financial framework.

- **Action 3:** Increase stakeholder awareness and involvement and improve enforcement

  3a) The Commission, together with Member States, will develop and launch a major communication campaign on Natura 2000 by 2013.

  3b) The Commission and Member states will improve cooperation with key sectors and continue to develop guidance documents to improve their understanding of the requirements of EU nature legislation and its value in promoting economic development.

  3c) The Commission and Member States will facilitate enforcement of the nature directives by providing specific training programmes on Natura 2000 for judges and public prosecutors, and by developing better compliance promotion capacities.

- **Action 4:** Improve and streamline monitoring and reporting

  4a) The Commission, together with Member States, will develop by 2012 a new EU bird reporting system, further develop the reporting system under Article 17 of the Habitats Directive and improve the flow, accessibility and relevance of Natura 2000 data.

  4b) The Commission will create a dedicated ICT tool as part of the Biodiversity Information System for Europe to improve the availability and use of data by 2012.

Target 2: Maintain and restore ecosystems and their services

By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems.

- **Action 5:** Improve knowledge of ecosystems and their services in the EU

  Member States, with the assistance of the Commission, will map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020.

- **Action 6:** Set priorities to restore and promote the use of green infrastructure

  6a) By 2014, Member States, with the assistance of the Commission, will develop a strategic framework to set priorities for ecosystem restoration at sub-national, national and EU level.

  6b) The Commission will develop a Green Infrastructure Strategy by 2012 to promote the deployment of green infrastructure in the EU in urban and rural areas, including through incentives to encourage up-front investments in green infrastructure projects and the maintenance of ecosystem services, for example through better targeted use of EU funding streams and Public Private Partnerships.

- **Action 7:** Ensure no net loss of biodiversity and ecosystem services

  7a) In collaboration with the Member States, the Commission will develop a methodology for assessing the impact of EU funded projects, plans and programmes on biodiversity by 2014.

  7b) The Commission will carry out further work with a view to proposing by 2015 an initiative to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes).

Target 3: Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity

3A) Agriculture: By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by biodiversity-related measures under the CAP so as to ensure the conservation of biodiversity and to bring about a measurable improvement(*) in the conservation status of species and habitats that depend on or are affected by agriculture and in the provision of ecosystem services as compared to the EU2010 Baseline, thus contributing to enhance sustainable management.

*3B) Forests: By 2020, Forest Management Plans or equivalent instruments, in line with Sustainable Forest Management (SFM) [30], are in place for all forests that are publicly owned and for forest holdings above a certain size** (to be defined by the Member States or regions and communicated in their Rural Development Programmes) that receive funding under the EU Rural Development Policy so as to bring about a measurable improvement(*) in the conservation status of species and habitats that depend on or are affected by forestry and in the provision of related ecosystem services as compared to the EU 2010 Baseline.*

(*) For both targets, improvement is to be measured against the quantified enhancement targets for the conservation status of species and habitats of EU interest in Target 1 and the restoration of degraded ecosystems under target 2.

(**) For smaller forest holdings, Member States may provide additional incentives to encourage the adoption of Management Plans or equivalent instruments that are in line with SFM.

- **Action 8:** Enhance direct payments for environmental public goods in the EU Common Agricultural Policy

  8a) The Commission will propose that CAP direct payments will reward the delivery of environmental public goods that go beyond cross-compliance (e.g. permanent pasture, green cover, crop rotation, ecological set-aside, Natura 2000).

  8b) The Commission will propose to improve and simplify the GAEC (Good Agricultural and Environmental Conditions) cross-compliance standards and consider including the Water Framework Directive within the scope of cross-compliance once the Directive has been implemented and the operational obligations for farmers have been identified in order to improve the state of aquatic ecosystems in rural areas.

- **Action 9:** Better target Rural Development to biodiversity conservation

  9a) The Commission and Member States will integrate quantified biodiversity targets into Rural Development strategies and programmes, tailoring action to regional and local needs.

  9b) The Commission and Member States will establish mechanisms to facilitate collaboration among farmers and foresters to achieve continuity of landscape features, protection of genetic resources and other cooperation mechanisms to protect biodiversity.

- **Action 10:** Conserve Europe's agricultural genetic diversity

  The Commission and Member States will encourage the uptake of agri-environmental measures to support genetic diversity in agriculture and explore the scope for developing a strategy for the conservation of genetic diversity.

- **Action 11:** Encourage forest holders to protect and enhance forest biodiversity

  11a) Member States and the Commission will encourage the adoption of Management Plans, [31] inter alia through use of rural development measures [32] and the LIFE+ programme.

  11b) Member States and the Commission will foster innovative mechanisms (e.g. Payments for Ecosystem Services) to finance the maintenance and restoration of ecosystem services provided by multifunctional forests.

- **Action 12:** Integrate biodiversity measures in forest management plans

  Member States will ensure that forest management plans or equivalent instruments include as many of the following measures as possible:

  - maintain optimal levels of deadwood, taking into account regional variations such as fire risk or potential insect outbreaks;
  - preserve wilderness areas;
  - ecosystem-based measures to increase the resilience of forests against fires as part of forest fire prevention schemes, in line with activities carried out in the European Forest Fire Information System (EFFIS);
  - specific measures developed for Natura 2000 forest sites;
  - ensuring that afforestation is carried out in accordance with the Pan-European Operational Level Guidelines for SFM [33], in particular as regards the diversity of species, and climate change adaptation needs.

Target 4: Ensure the sustainable use of fisheries resources

Achieve Maximum Sustainable Yield (MSY) by 2015. Achieve a population age and size distribution indicative of a healthy stock, through fisheries management with no significant adverse impacts on

other stocks, species and ecosystems, in support of achieving Good Environmental Status by 2020, as required under the Marine Strategy Framework Directive.

- **Action 13:** Improve the management of fished stocks

  13a) The Commission and Member States will maintain and restore fish stocks to levels that can produce MSY in all areas in which EU fish fleets operate, including areas regulated by Regional Fisheries Management Organisations, and the waters of third countries with which the EU has concluded Fisheries Partnership Agreements.

  13b) The Commission and Member States will develop and implement under the CFP long-term management plans with harvest control rules based on the MSY approach. These plans should be designed to respond to specific time-related targets and be based on scientific advice and sustainability principles.

  13c) The Commission and Member States will significantly step up their work to collect data to support implementation of MSY. Once this objective is attained, scientific advice will be sought to incorporate ecological considerations in the definition of MSY by 2020.

- **Action 14:** Eliminate adverse impacts on fish stocks, species, habitats and ecosystems

  14a) The EU will design measures to gradually eliminate discards, to avoid the by-catch of unwanted species and to preserve vulnerable marine ecosystems in accordance with EU legislation and international obligations.

  14b) The Commission and Member States will support the implementation of the Marine Strategy Framework Directive, including through providing financial incentives through the future financial instruments for fisheries and maritime policy for marine protected areas (including Natura 2000 areas and those established by international or regional agreements). This could include restoring marine ecosystems, adapting fishing activities and promoting the involvement of the sector in alternative activities, such as eco-tourism, monitoring and managing marine biodiversity, and combating marine litter.

Target 5: Combat invasive alien species

By 2020, Invasive alien species (IAS) and their pathways are identified and prioritised, priority species are controlled or eradicated, and pathways are managed to prevent the introduction and establishment of new IAS.

- **Action 15:** Strengthen the EU Plant and Animal Health Regimes

  The Commission will integrate additional biodiversity concerns into the Plant and Animal Health regimes by 2012.

- **Action 16:** Establish a dedicated instrument on invasive alien species

  The Commission will fill policy gaps in combating IAS by developing a dedicated legislative instrument by 2012.

Target 6: Help avert global biodiversity loss

By 2020, the EU has stepped up its contribution to averting global biodiversity loss.

- **Action 17:** Reduce indirect drivers of biodiversity loss

  17a) Under the EU flagship initiative on resource efficiency, the EU will take measures (which may include demand and/or supply side measures) to reduce the biodiversity impacts of EU

consumption patterns, particularly for resources that have significant negative effects on biodiversity.

17b) The Commission will enhance the contribution of trade policy to conserving biodiversity and address potential negative impacts by systematically including it as part of trade negotiations and dialogues with third countries, by identifying and evaluating potential impacts on biodiversity resulting from the liberalisation of trade and investment in ex-ante Impact Assessments and ex-post evaluations, and seek to include in all new trade agreements a chapter on sustainable development providing for substantial environmental provisions of importance in the trade context including on biodiversity goals.

17c) The Commission will work with Member States and key stakeholders to provide the right market signals for biodiversity conservation, including work to reform, phase out and eliminate harmful subsidies at both EU and Member State level, and to provide positive incentives for biodiversity conservation and sustainable use.

- **Action 18:** Mobilise additional resources for global biodiversity conservation

  18a) The Commission and Member States will contribute their fair share to international efforts to significantly increase resources for global biodiversity as part of the international process aimed at estimating biodiversity funding needs and adopting resource mobilisation targets for biodiversity at CBD CoP11 in 2012 [34].

  18b) The Commission will improve the effectiveness of EU funding for global biodiversity inter alia by supporting natural capital assessments in recipient countries and the development and/or updating of National Biodiversity Strategies and Action Plans, and by improving coordination within the EU and with key non-EU donors in implementing biodiversity assistance/projects.

- **Action 19:** Biodiversity-proof EU development cooperation

  19) The Commission will continue to systematically screen its development cooperation action to minimise any negative impact on biodiversity, and undertake Strategic Environmental Assessments and/or Environmental Impact Assessments for actions likely to have significant effects on biodiversity.

- **Action 20:** Regulate access to genetic resources and the fair and equitable sharing of benefits arising from their use

  The Commission will propose legislation to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation in the European Union so that the EU can ratify the Protocol as soon as possible and by 2015 at the latest, as required by the global target.

ANNEX 6 – BUSINESS-AS-USUAL SCENARIO WITHOUT THE STRATEGY

Baseline for the evaluation

Due to the complexity of biodiversity loss and the wide range of direct and indirect drivers of biodiversity loss, it was not possible to establish a clear baseline for the evaluation.

The expectations of how the state of biodiversity, and pressures on it, would develop in the absence of an EU Biodiversity Strategy were articulated in a business-as-usual (BAU) scenario as part of the Impact Assessment of the EU Biodiversity Strategy to 2020 (SEC(2011) 540 final, hereafter referred to as the Impact Assessment).

The Impact Assessment concluded that under a 'business as usual' scenario, overexploitation, pollution, habitat loss, climate change and invasion by alien species would likely continue or worsen. It predicted that mean species abundance would continue to decline in Europe, from approximately 40% in 2010 to approximately 37% in 2050. With the existing measures and policies in place, it was considered that anthropogenic pressures would continue or worsen and would result in further degradation of EU ecosystems.

The business as usual (BAU) scenario included in the Impact Assessment made a qualitative projection of the consequences of existing policy and legislation. This projection provided a useful point of reference to consider the role of the Strategy in addressing biodiversity needs. It was revisited for the purposes of the evaluation study. Minor retrospective changes were introduced in light of the actual development of some of the EU policies and legislation.

The IA reviewed pre-existing EU policy areas against the 4 aspects of the headline target of the EU Biodiversity Strategy: (1) halting biodiversity loss, (2) halting degradation of ecosystem services, (3) restoring biodiversity and ecosystem services, (3) counteracting increased loss of biodiversity at the global level. It also reviewed these policies against their contribution to reducing the following pressures on biodiversity: over-exploitation, fragmentation, climate change, invasive species and pollution. This review structure is continued here while highlighting the connection to the six Biodiversity Strategy targets.

The BAU is concerned with other EU legal and policy initiatives to the extent that:

(i) the Strategy aimed to support these policies, for example the implementation of the EU Birds and Habitats Directives (Target 1) and the Marine Strategy Framework Directive (Target 3). In reality, it has been very difficult to predict or assess what part of progress has been the result of the implementation of the legislation itself, or from the Strategy.

(ii) the Strategy aimed to change these policies, for example the CAP (Target 3) and the Common Fisheries Policy (Target 4), or trade (Target 6). The BAU assumed that the needed reforms would not take place without the strategy's targets.

(iii) the Strategy aimed to introduce new policies and legislation, for example on Green Infrastructure or on invasive alien species.

Contribution of pre-existing policies and connections to the Strategy

- ***Biodiversity policies***

The Habitats and Birds Directives are at the core of EU biodiversity policy. They have been the basis for the establishment of the Natura 2000 network. Improvements of the conservation status of protected species and habitats were therefore likely to have occurred as a result of the Nature Directives alone. However, the implementation of the Directives is likely to have been slower and less effective without the additional measures encouraged by the Strategy. This includes targets and actions to further integrate species and habitat protection into key EU land and sea use policies,

increase financing, facilitate the sharing of good practices, increase awareness and improve enforcement,.

Designation and management of protected areas under the Habitats Directive alone is also unlikely sufficient to curb biodiversity loss. With efforts focused on protected species and habitats only, biodiversity in the wider landscape was expected to suffer. The conservation status of species and habitats protected under EU nature legislation was expected to remain similar to that of the 2009 health check, with only 17% of the assessments completed showed a good conservation status.

Connections to the Strategy

Targets 1 and 2 of the Biodiversity Strategy set out to address some of the shortcomings in earlier biodiversity policies. Target 1 aimed to complete the establishment of the Natura 2000 Network and ensure its good management, a key aspect being to ensure adequate financing for the sites. It also aimed to increase the exchange of good practice and improve the enforcement of the Directives. Target 2 included actions to improve knowledge of ecosystems and their services, set priorities for ecosystem restoration and the deployment on green infrastructure, with direct potential benefits for protected habitats and species and for improving the ecological connectivity of Natura 2000. The increase of the contribution of agriculture and forestry to biodiversity under Target 3 was also to be measured against the improvement in the conservation status of protected species and habitats.

- ***Agriculture and forestry policies***

The Common Agricultural Policy (CAP) and the EU Forestry Strategy have major impact on biodiversity outcomes. However, unsustainable practices such as intensive farming The CAP had been reformed on several occasions prior to the EU Biodiversity Strategy. As reported in the IA however, the impacts had been small to negative. The IA BAU scenarios concluded that without considerable reform of the Common Agricultural Policy (in the absence of such targets as were set by the Strategy), agriculture in the EU would continue to be one of the most significant drivers of habitat loss and degradation. Insufficient policy change was predicted to lead to further biodiversity loss on farmland, with serious implications for the EU meeting the global 2020 biodiversity goals.

Connection to the Strategy

The reform of the CAP is linked most closely to Target 3 of the Biodiversity Strategy, which aimed to increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity.

- ***Air policies***

The Air Quality Framework Directive, The Clean Air For Europe programme (CAFÉ), National Emissions Ceilings Directive, Integrated Pollution Prevention and Control (IPPC), Large Combustion Plants Directive, Waste Incineration Directive and Thematic Strategy on Air Pollution would have collectively acted to reduce the pressure of pollution from a wide range of sources on biodiversity. Overall, the improvement in air quality would have been generally beneficial to the natural environment. Reduction of localised nitrogen deposition on land and sea would support low nutrient habitats, such as inland wetlands.

Connections to the Strategy:

Target 2 of the EU Biodiversity Strategy, which aims to maintain and restore ecosystems and their services by, amongst other things, restoring at least 15% of degraded habitats. Achieving this target was aided by the reduction in pressures resulting from Air Quality related policies and strategies. However, it unclear whether the absence of the Strategy would have resulted in weaker measures to tackle the impact of air pollution on ecosystems than the ones undertaken under EU air policies.

- ***Water policies***

The EU Water Framework Directive (WFD) and the Floods Directive have a major potential to improve the ecological status of freshwater bodies as well as the condition of terrestrial and marine

ecosystems that depend on them through the provisions on achieving good ecological status and integrated river basin management. The impact assessment recognised the WFD key role in biodiversity protection and ecosystem restoration. It suggested that if adequately implemented, a significant amount of restoration of water related ecosystems would likely take place even in the absence of the Strategy. However, it made no assessment of whether the WFD would be implemented adequately. The deadline for achieving good status for water bodies throughout the EU was 2015 but progress has been slow and the target has not been achieved to date.

Connections to the Strategy

Target 1 of the Strategy included actions on cross-policy integration in the implementation of the Nature Directives and of the WFD. Target 2 of the Strategy highlighted the role of ecosystem services and green infrastructure, which can strengthen approaches to the management of natural disasters such as flooding or droughts. In addition, Target 3 specifically linked the EU CAP with the WFD highlighting the potential for cross-compliance.

- ***Fisheries and Marine policies***

Overfishing has been a major issue for marine ecosystems despite the 2002 reform of the Common Fisheries Policy (CFP). In 2011, at the time of adoption of the Biodiversity Strategy to 2020, EU stocks were being fished beyond maximum sustainable yield (MSY) in 88% of cases, , and the average size of fish continued to decline. Without reform to the CFP, the impact assessment of the EU Biodiversity Strategy to 2020, as well as the impact assessment undertaken for the 2013 Reform of the CFP, concluded that further depletion of fish stocks would be expected, leading to setbacks for the attainment of good environmental status for EU marine waters by 2020. (Following the adoption of the EU Biodiversity Strategy to 2020, the 2013 Reform of the CFP has further enshrined MSY in the CFP by making it a legal obligation to be achieved by 2020 and the multi-annual plans for the Baltic, the North Sea and the Western Waters have further specified this objective for all target species in these waters. In doing so, the 2013 Reform of the CFP has enabled the achievement of 62 TACs fished in line with MSY by 2020 against only 5 in 2009.)

The Marine Strategy Framework Directive (MSFD) aimed to conserve the marine environment and attain Good Environmental Status (GES) of marine ecosystems. It supported protected areas and ecosystem restoration to achieve GES. However, restoration had been challenging to understand and the target of good environmental status was difficult to quantify. Nonetheless, the MSFD has helped drive increases in scientific understanding of the marine environment, which is necessary to support restoration.

Connections to the Strategy

Target 4 aimed for sustainable use of fish resources and suggested all fisheries achieve maximum sustainable yield (MSY) by 2015. It further encouraged the development and implementation of management plans, and the stepping up of work to collect data to support MSY. These measures were taken up in the revised CFP, although the originally proposed target date 2015 for achieving MSY was postponed. Action 14b in the Biodiversity Strategy encouraged the Member States to support the achievement of good environmental status under the MSFD, including by measures to restore marine ecosystems. Target 2 of the Biodiversity Strategy also aimed to restore at least 15% of degraded ecosystems. The Biodiversity Strategy identified in Target 4, Action 13a, that EU fishing fleets should maintain and restore fish stocks to MSY in all areas that the fleet operate including areas regulated by Regional Fisheries Monitoring Organisations and waters of third countries.

- ***Plant and Animal Health policies***

The Plant Health Directive and Animal Health Strategy were both under review raising the possibility that their scope could be expanded to include pest and diseases of wild species. For the

plant health regime, the possibility of including all invasive alien plants causing damage to the wider environment was also being considered. However, in the absence of a dedicated target, the extent of integration of provisions on invasive alien species in plant and animal health legislation and policy is likely to have been much smaller. Legislation focusing on plant and animal health would also have been insufficient to provide a coherent EU wide framework to combat invasive alien species.

Connections to the Strategy

The Biodiversity Strategy included an action under Target 5 to integrate biodiversity concerns into the Plant and Animal Health Regimes by 2012, and to adopt legislation on IAS.

- ***Regional development***

EU Cohesion Policy funds, such as the European Regional Development Fund, the Cohesion Fund and the European Social Fund, have contributed to investments directly benefiting biodiversity, environmental quality improvements, investments in Green Infrastructure and rehabilitation of contaminated land. However, under a business-as-usual scenario, such investments may not have been sufficiently supported and potential negative impacts from investments in infrastructure and other developments may not have been given sufficient attention to minimise and mitigate harm on biodiversity.

Connections to the Strategy

Under Target 2 of the Strategy, a Green Infrastructure Strategy was adopted which has provided impetus for investments in green infrastructure and ecological corridors; and a biodiversity proofing methodology was developed for assessing the impact of EU funded plans, projects and programmes on biodiversity.

- ***Consumption and Production policies***

A broad set of policies and plans preceded the Biodiversity Strategy, including: the Integrated Product Policy (IPP), EU Eco-Management and Audit Scheme (EMAS), Ecolabel, Eco-innovation Action Plan, Green Public Procurement Policy, Economic Reform Programme (ERP), Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan, Environmental Liability Directive, and EU Forest Law Enforcement, Governance and Trade (FLEGT) Action Plan. These aimed to reduce the impacts of consumption and production on biodiversity. Eco-labelling and certification would have reduced ecological footprints in terrestrial, freshwater and marine environments. The Environmental Liability Directive established a framework for preventing and remedying environmental damage, defined as damage to protected species and natural habitats, damage to water and damage to soil. Overall, under the BAU scenario, these policies would have had an important, though often indirect, benefit to biodiversity. However, there remained scope for greater coordination to support these policies in making a tangible difference for EU and global biodiversity.

Connections to the Strategy

Several elements of the Biodiversity Strategy aimed to address consumption and production impacts on biodiversity. Target 2 included actions to improve knowledge of ecosystems and their services. Target 3 targeted more sustainable agricultural and forestry production, whilst Target 4 aimed to ensure that fisheries resources are used sustainably. Lastly, Target 6 included actions to reduce indirect drivers of biodiversity loss linked to EU production and consumption.

- ***Climate and Energy policies***

The impact assessment stated that achieving the '2 degrees' climate target is essential to avert global biodiversity loss. The EU had already developed and was implementing a suit of climate change policies, including: the EU 20/20/20 climate change target White paper on adaptation to climate change (COM (2009) 0147), Reducing Emissions from Deforestation and Forest Degradation (REDD) initiative, European Climate Change Programme (ECCP), and European Emission Trading Scheme (ETS). It was unclear in 2010 whether these policies would be sufficient to enable the EU to meet its climate targets for 2020 and beyond. To the extent that they contributed to mitigating climate change, these policies have been expected to slow down climate impacts on biodiversity and ecosystem services. Similar to other policy areas, a business-as-usual scenario may have included insufficient attention to minimising potential biodiversity harm from increased demand for resources and infrastructure developments for renewable energy.

Overall, it seems likely that climate policies under the BAU scenario would have developed similarly to the scenario with a Strategy, and climate impacts would have continued to impact biodiversity to 2020, with some types of mitigation activities adding pressure on biodiversity.

Connections to the Strategy

Target 2 aimed to encourage better use of nature-based approaches to tackle climate change. Nature-based solutions and green infrastructure can provide cost-effective approaches to climate mitigation and adaptation, and ecosystem restoration can increase resilience to the impacts of climate change. Target 3 contained actions to promote sustainable agriculture and forestry. Target 4 aimed to support the achievement of good environmental status of marine ecosystems. Climate change is an important pressure on marine and terrestrial ecosystems, as well as a factor in increased invasive species dynamics. Climate change is also a growing pressure on global biodiversity and ecosystem services.

- ***Policies regarding external relations***

A broad set of policies existed prior to the Biodiversity Strategy that addressed the EU's international relations and trade, including aspects relating to biodiversity change. The Thematic Programme for Environment and Natural Resources (ENRTP), European Neighbourhood and Partnership Instrument (ENPI), Development Cooperation and Economic Cooperation Instrument (DCECI) and European Development Fund (EDF) made contributions to biodiversity initiatives, partnerships and global multilateral processes. It is likely that under a BAU scenario this funding would have continued, including in implementation of the EU's commitments under the Convention on biological diversity. Global Multilateral Environmental Agreements, funds and trade agreements have been important to support action to support biodiversity globally. The EU has been key in supporting global biodiversity by means of best practice exchange, funding and leadership. It is likely that under BAU this role would have continued, but to a lesser extent.

Connections to the Strategy

Target 6 of the Biodiversity Strategy aimed to improve the impact of trade agreements on biodiversity via Trade Sustainability Impact Assessments. A chapter on sustainable development is suggested in all trade agreements. It also includes an action to mobilise additional resources for global biodiversity conservation and an action to screen EU development cooperation to minimise negative biodiversity impacts.

Conclusion of the Business-As-Usual Scenario

Overall, the BAU suggested that without significant policy reforms and additional measures to strengthen the implementation of existing legislation, the EU would not attain its 2020 biodiversity targets. In the absence of the Strategy, continued ecosystem degradation, through land-use changes and invasive alien species, amongst others, were expected to negatively impact species and habitats across the majority of EU Member States.

ANNEX 7 – MAIN OUTPUTS OF THE EU BIODIVERSITY STRATEGY TO 2020

Annex 7 provides an overview of key outputs from the implementation of the Strategy's actions by the Commission and the Member States. This concerns in particular outputs at the EU level. Outputs under other EU legislation and policies are included, to the extent that certain aspects of these EU instruments formed part of the Strategy. For highlights of achievements (as well as challenges) at the national level in the 10 case study Member States, see Annex 8.

Target 1	Fully implement the Birds and Habitats Directives	Measures taken
Action 1: Complete the establishment of the Natura 2000 Network and ensure good management	1a) Complete the establishment of Natura 2000, including in the marine environment. 1b) Member States and the Commission will further integrate species and habitat protection and management requirements into key land and water use policies, both within and beyond Natura 2000 areas. 1c) Member States will ensure that management plans or equivalent instruments which set out conservation and restoration measures are developed and implemented in a timely manner for all Natura 2000 sites. 1d) The Commission, together with Member States, will establish by 2012 a process to promote the sharing of experience, good practice, and cross-border collaboration on the management of Natura 2000, within the biogeographical frameworks set out in the Habitats Directive.	• Member States have almost completed the terrestrial Natura 2000 network (covering about 18% of EU land area by 2020), and significantly increased the marine network (from 3% in 2010 to 9% for EU-28 and 8% for EU-27 in 2020). • Commission Guidance on permitting procedures, Article 6 (update of previous guidance), sector-specific guidance with input from ad hoc working groups of national authorities and experts from other sectors (energy, transport, extractive industries, fisheries, farming, forestry, aquaculture, etc), • Strengthened links the between Nature Directives and other key environmental legislation (IAS, MSFD, WFD, Nitrates). • EU and international species and habitat action plans for threatened habitats and species. • Action Plan for Nature, People, and the Economy launched in 2017 with actions to strengthen implementation, enforcement, policy integration and awareness raising. • Management plans established for 15 500 Natura 2000 sites (SACs) covering an area of 358,000 km by 2020 • Natura 2000 Biogeographical Process[270] launched in 2012, bringing together national conservation agencies, government officials, experts and stakeholders to discuss solutions to common challenges at the level of the biogeographical regions.
Action 2: Ensure adequate financing of Natura 2000 sites	2) The Commission and Member States will provide the necessary funds and incentives for Natura 2000, including through EU funding instruments, under the next Multi-annual Financial Framework. The Commission will set out its views in 2011 on how Natura 2000 will be financed under the next Multi-annual Financial Framework.	• Regulations on EU funding instruments (2013) required Prioritised Action Frameworks (PAF) to be considered in programming and included indicators of funding for Natura 2000. • Varying level of uptake by the Member States of CAP Natura 2000 support measures • Member States' Prioritised Action Frameworks developed and implemented • since 2012 supporting authorities in EU Member States to implement Natura 2000. LIFE Preparatory Projects on tools to promote private land conservation. • Natura 2000 funding handbook published in 2014.

[270] https://ec.europa.eu/environment/nature/natura2000/seminars_en.htm

Action 3: Increase stakeholder awareness and involvement and improve enforcement	3a) The Commission, together with Member States, will develop and launch a major communication campaign on Natura 2000 by 2013. 3b) The Commission and Member States will improve cooperation with key sectors and continue to develop guidance documents to improve their understanding of the requirements of EU nature legislation and its value in promoting economic development. 3c) The Commission and Member States will facilitate enforcement of the nature directives by providing specific training programmes on Natura 2000 for judges and public prosecutors, and by developing better compliance promotion capacities.	• European Natura 2000 Award launched in 2013 with European Citizen's Award from 2016, Natura 2000 Day annually since 2017. • EU Platform on Coexistence between People and Large Carnivores held regular dialogues and meetings since 2014; LIFE Eurolargecarnivores project. • Collaboration between the Commission and stakeholders (hunters association and NGO) to produce guidance on hunting and Natura 2000, a dedicated awareness-raising programme on Natura 2000 among hunters, study on bird species action plan method. • EMS national, regional, and local authorities have organised exchanges on implementation issues with support from the Peer2Peer tool. • Training for judges and prosecutors was provided in implementation of the Action plan for nature, people and the economy. • Coordinated EU action on illegal trapping, killing and trade of birds, Intergovernmental Task Force on Illegal Killing, Taking and Trade of Migratory Birds in the Mediterranean. • Biannual meetings of Technical Platform for Cooperation on the Environment focused on the smart and effective implementation by local and regional authorities of the Birds and Habitats Directives (from 2017). • Update of guidance on species protection in preparation.
Action 4: Improve and streamline monitoring and reporting	4a) The Commission, together with Member States, will develop by 2012 a new EU bird reporting system, further develop the reporting system under Article 17 of the Habitats Directive and improve the flow, accessibility and relevance of Natura 2000 data. 4b) The Commission will create a dedicated ICT tool as part of the Biodiversity Information System for Europe to improve the availability and use of data by 2012.	• Commission developed, together with the Member States, the method to report on the status and trends of their bird populations • (Member States' reports (State of Nature report 2015 and State of Nature report 2020). • HABIDES+ reporting tool on derogations made operational. • Member States have cooperated with the Commission in the Expert Group on Reporting to improve quality and coherence of Article 17/12 and Natura 2000 data reporting. • EEA Natura 2000 network viewer tool as part of Biodiversity Information System for Europe (BISE).
Target 2	**Maintain and restore ecosystems and their services**	
Action 5: Improve knowledge of ecosystems and their services in the EU	5) Member States, with the assistance of the Commission, will map and assess the state of ecosystems and their services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems at EU and national level by 2020.	• Member States and the Commission have launched the Mapping and Assessment of Ecosystems and their Services (MAES) initiative: Research, pilot studies and EU workshops. • MAES reports: (1) analytical framework and typologies of ecosystems and ecosystem services; (2) indicators to map and assess biodiversity, ecosystem condition and ecosystem services; (3) available information; (4) urban ecosystems and their services; (5) integrated analytical framework and indicators.

		• All Member States have progressed in the mapping and assessment of ecosystems and their services in their territories (MAES barometer). • The project "Integrated System of Natural Capital and ecosystem services accounting in the EU" (KIP-INCA) proposed a design of a NCA system and produced a suite of EU-level ecosystem accounts including time series of ecosystem extent accounts, ecosystem services accounts (on water purification, crop pollination, recreation, crop provision, timber provision, global climate regulation, and flood control) and pilot ecosystem provision accounts. • EU research projects: OpenNess and OPERAS, OPPLA hub on nature-based solutions, ESMERELDA. (See horizontal action on knowledge for more activities). • EU Pollinators Initiative launched in 2017 with communication campaigns, information, guidance, and capacity building as well as actions to improve knowledge on pollinator decline and its drivers.
Action 6: Set priorities to restore and promote the use of green infrastructure	6a) By 2014, Member States, with the assistance of the Commission, will develop a strategic framework to set priorities for ecosystem restoration at sub-national, national and EU level. 6b) The Commission will develop a Green Infrastructure Strategy by 2012 to promote the deployment of green infrastructure in the EU in urban and rural areas, including through incentives to encourage up-front investments in green infrastructure projects and the maintenance of ecosystem services, for example through better targeted use of EU funding streams and Public Private Partnerships.	• Estimation of the financing needs to implement Target 2 (IEEP, 2013). • EU Green Infrastructure Strategy (COM(2013)249 final). • Actions across all Member States to deploy green and blue infrastructure: see Review of progress on the implementation of the EU green infrastructure Strategy (COM(2019)236 final and SWD(2019)184 final) • Increased financing possibilities for green infrastructure projects under the multi-annual financial framework for the period 2014-2020 and Commission guidance on opportunities under different EU policies and funding instruments.. • EU guidance on a strategic framework for further supporting the deployment of EU-level green and blue infrastructure SWD(2019) 193 final • Study to support Restoration Prioritization Frameworks (Arcadis, 2014). • Commission review of progress in implementing the EU GI Strategy (2019). Horizon 2020 funding for research programmes on green infrastructure and on pollinators (2020). EU guidance to the Member States on developing Restoration Prioritization Frameworks; • Publication of restoration prioritization frameworks by several Member States. • EU Pollinators Initiative and preparatory action on EU pollinator monitoring and indicators.
7. Ensure no net loss of biodiversity and ecosystem	7a) In collaboration with the Member States, the Commission will develop a methodology for assessing the impact of EU-funded projects, plans and programmes on biodiversity by 2014.	• Common framework for biodiversity-proofing the EU funding programmes and sector-specific guidance published in 2013. • Guidance on integrating ecosystems and their services into decision-making

services	7b) The Commission will carry out further work with a view to proposing by 2015 an initiative to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes).	(SWD(2019) 305 final) published in 2019. • No Net Loss Working Group defined the scope and objectives and the operational principles of a NNL initiative. • Study of policy options for achieving NNL target (IEEP, 2013) and study of potential impacts of options (IEEP, 2016). • Public consultation in 2016 revealed diverging opinions on policy instruments for the initiative, in particular offsetting. No further policy development occurred, other than publication in 2020 of guidance on NNL of biodiversity and ecosystem services.
Target 3	**Increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity**	
8. Enhance direct payments for environmental public goods in the EU Common Agricultural Policy	8a) The Commission will propose that CAP direct payments will reward the delivery of environmental public goods that go beyond cross-compliance (e.g. permanent pasture, green cover, crop rotation, ecological set-aside, Natura 2000). 8b) The Commission will propose to improve and simplify the GAEC (Good Agricultural and Environmental Conditions) cross-compliance standards and consider including the Water Framework Directive within the scope of cross-compliance once the Directive has been implemented and the operational obligations for farmers have been identified in order to improve the state of aquatic ecosystems in rural areas.	• Mandatory greening measures in CAP (2014-2020) direct payments covered 80% of UAA. • Overall limited impact of ecological focus areas due to Member States' choices often favouring EFA types of low biodiversity value. • Ban on ploughing up all environmentally sensitive permanent grassland covered about 1/3 of permanent grassland in Natura 2000 and only 1% outside of it. • Cross-compliance: GAECs help to maintain landscape elements, reduce pollution and soil erosion – but most Member States have settled for minimum standards.
9. Better target Rural Development to biodiversity conservation	9a) The Commission and Member States will integrate quantified biodiversity targets into Rural Development strategies and programmes, tailoring action to regional and local needs. 9b) The Commission and Member States will establish mechanisms to facilitate collaboration among farmers and foresters to achieve continuity of landscape features, protection of genetic resources and other cooperation mechanisms to protect biodiversity.	• Rural Development Regulation 2013 included focus area 4A for MS to programme measures dedicated to biodiversity, with mandatory 30% to be spent on environmental measures. • Voluntary commitments under pillar II add targeted environmental provisions: on 15% of UAA for AECM measures, and on 5% of UAA for organic farming. • The area supported by payments for Natura 2000 (M12) has increased by 45.5%, however the measure has been infrequently used by Member States. • ENRD workshops with the Member States, dissemination of best practices e.g., results-based payments approach (notably EU funded pilots 2014-2019). • Common farmland birds index and the conservation status of grassland habitats (as reported under the Habitats Directive reporting) used as context and impact indicators for biodiversity. • European Innovation Partnerships for Agricultural Sustainability and Productivity.
10. Conserve	10) The Commission and Member States will encourage the uptake of	• Rural Development Regulation included sub measure to support agricultural genetic

Europe's agricultural genetic diversity	agri-environmental measures to support genetic diversity in agriculture and explore the scope for developing a strategy for the conservation of genetic diversity.	diversity. • EU funded research projects on ex-situ and in-situ conservation of plant genetic resources including crops. • EP preparatory action on EU plant and animal genetic resources. Stakeholders objected to the failure to protect farmers' rights to exchange traditional seeds.
11. Encourage forest holders to protect and enhance forest biodiversity	11a) Member States and the Commission will encourage the adoption of Management Plans, inter alia through use of rural development measures and the LIFE+ programme. 11b) Member States and the Commission will foster innovative mechanisms (e.g., Payments for Ecosystem Services) to finance the maintenance and restoration of ecosystem services provided by multifunctional forests.	• Funding for forest measures through the CAP Rural Development Programmes from 2014 to 2020 was made conditional on the existence of a forest management plan or equivalent instrument in line with the sustainable forest management principles of Forest Europe. • Some Member States have used CAP forest measures and the afforestation and agroforestry elements of the EFA in forest areas, but overall infrequently. • Member States have only targeted EFA measures at very few high biodiversity forests.
12. Integrate biodiversity measures in forest management plans	12) Member States will ensure that forest management plans or equivalent instruments include as many of the following measures as possible: – maintain optimal levels of deadwood, considering regional variations such as fire risk or potential insect outbreaks. – preserve wilderness areas. – ecosystem-based measures to increase the resilience of forests against fires as part of forest fire prevention schemes, in line with activities carried out in the European Forest Fire Information System (EFFIS) – specific measures developed for Natura 2000 forest sites – ensuring that afforestation is carried out in accordance with the Pan-European Operational Level Guidelines for SFM33, as regards the diversity of species, and climate change adaptation needs.	• Diversity of Member States approaches to forest management planning. • A Guidance document on Natura 2000 and forests. • Commission study on implementing sustainable forest management according to the EU Biodiversity Strategy and the EU Bioeconomy Strategy (NEPCon, 2018). • The assessment of progress in implementing the EU Forest Strategy in 2019 (EFI et al., 2019) stated that an overview of the status of forest management plans throughout Europe is lacking, as is an analysis of the extent of biodiversity measures included in such plans.
Target 4	**Ensure the sustainable use of fisheries resources**	
13. Improve the management of fished stocks	13a) The Commission and Member States will maintain and restore fish stocks to levels that can produce MSY in all areas in which EU fish fleets operate, including areas regulated by Regional Fisheries Management Organisations, and the waters of third countries with which the EU has concluded Fisheries Partnership Agreements. 13b) The Commission and Member States will develop and implement under the Common Fisheries Policy (CFP) long-term management plans with harvest control rules based on the MSY approach. These plans	• Reformed Common Fisheries Policy Regulation adopted in 2013 set target to achieve MSY by 2015 where possible, and by 2020 at the latest. • Fishing opportunities are set to bring stocks at safe and sustainable levels and ensure that they are fished at maximum sustainable yield levels. Further efforts are needed on Mediterranean and Black Sea stocks. • Member States gradually introduced landing obligations for all species subject to catch limits, and in the Mediterranean also for species subject to minimum sizes, implemented at the fishery level through multiannual plans or specific discard plans.

	should be designed to respond to specific time-related targets and be based on scientific advice and sustainability principles. 13c) The Commission and Member States will significantly step up their work to collect data to support implementation of MSY. Once this objective is attained, scientific advice will be sought to incorporate ecological considerations in the definition of MSY by 2020.	• Taskforce for approving multi-annual plans set up. Multiannual plans, including work to develop use of Total Allowable Catch (TAC) limits. • The Multiannual Union programme for the collection, management and use of data in the fisheries and aquaculture sectors for the period 2017-2019 contains an obligation to collect data on the impact of fisheries on protected and endangered species and habitats, first through pilot studies to test different methodologies before including in the regular sampling plan.
14. Eliminate adverse impacts on fish stocks, species, habitats and ecosystems	14a) The EU will design measures to gradually eliminate discards, to avoid the by-catch of unwanted species and to preserve vulnerable marine ecosystems in accordance with EU legislation and international obligations. 14b) The Commission and Member States will support the implementation of the Marine Strategy Framework Directive, including through providing financial incentives through the future financial instruments for fisheries and maritime policy for marine protected areas (including Natura 2000 areas and those established by international or regional agreements). This could include restoring marine ecosystems, adapting fishing activities and promoting the involvement of the sector in alternative activities, such as eco-tourism, monitoring and managing marine biodiversity, and combating marine litter.	• EU Action Plan for reducing incidental catches of seabirds in fishing gears (COM/2012/0665 final). EU Action Plan for the conservation and management of sharks (COM/2009/0040 final). • Shark finning regulation No 1185/2003, as amended by Regulation No 605/2013 prohibited the practice of shark finning in EU waters and for all EU vessels fishing everywhere, and required reporting of shark landings. • Data Collection Framework Regulation (2017) set requirements for data collection on incidental bycatch of seabirds, cetaceans, and other protected species. • New Technical Measures Regulation No 2019/1241 set measures to increase the use of selective fishing gear, restrict the use of non-selective gear such as drift nets and bottom trawlers, prohibit the catch of certain species and fishing in certain sensitive habitats, and mitigation measures to reduce or prevent bycatch of protected species. • Some Member States have developed fisheries measures to protect sensitive species and habitats at both the national and regional levels. Regional cooperation between fisheries administrations and stakeholders has expanded, with the support of regional seas conventions. • Member States have progressed in setting up marine strategies to pursue good environmental status, however resources and measures have been insufficient to target the most important pressures, prevent deterioration and restore marine ecosystems (Commission report on the MSFD implementation (COM/2020/259 final)). Spatial analysis of MPA networks and methodology to assess network coherence (2015), guidance on the establishment of fisheries conservation measures under the CFP for Natura 2000 sites and for the MSFD (2018). • Adoption and implementation of the EMFF 2014-2020, including measures to help fishers adapt to sustainable fishing, and to preserve and protect the marine environment.
Target 5	**Combat invasive alien species**	

15. Strengthen the EU plant and animal health regimes	15) The Commission will integrate additional biodiversity concerns into the Plant and Animal Health Regimes by 2012.	• Commission 2013 proposal for package of measures on animal health. • Revised EU Plant Health Regulation (2016) including list of priority pests with adverse impacts on biodiversity and native plants. • EU Animal Health Law (2016) establishes list of diseases negatively impacting biodiversity and the wider environment in the EU. • 2018 expanded list of priority notifiable diseases and their carriers includes diseases affecting bats and other wild mammals, bumblebees, wild birds, fish, shellfish, and crustaceans. • 2019 list of 20 quarantine pests as priority pests, whose economic, environmental and social impacts on the EU territory is most severe.
16. Establish a dedicated instrument on invasive alien species	16) The Commission will fill policy gaps in combating IAS by developing a dedicated legislative instrument by 2012.	• The EU IAS Regulation was adopted in 2014 and entered into force in 2015, provides a framework to combat IAS. • Lists of invasive alien species of Union concern adopted in 2016 and updated in 2017 and 2019, to a total of 66 species. • Restrictions and obligations for IAS eradication or management gradually kicked-in over the period 2016-2019, including measures on their prevention, early detection, rapid eradication, and management. • Most Member States have set up a surveillance system and carry out official controls for IAS on the Union List. • Most Member States have identified the priority pathways relevant to them. However, most Member States have not yet implemented the action plans to address the priority pathways. In June 2021, the Commission initiated procedures against 18 Member States. • European Alien species Information Network (EASIN) platform that provides information of alien species in Europe, Within EASIN, JRC developed the including a notification system (NOTSYS) to exchange information and early alerts on occurrence of IAS included in the Union list. • J
Target 6	**Contribute to averting global biodiversity loss**	
17. Reduce indirect drivers of biodiversity loss	17a) Under the EU flagship initiative on resource efficiency, the EU will take measures (which may include demand and/or supply side measures) to reduce the biodiversity impacts of EU consumption patterns, particularly for resources that have significant negative effects on biodiversity. 17b) The Commission will enhance the contribution of trade policy to	• EU Flagship initiative on Resource Efficiency actions to analyse environmental footprints and improve the knowledge base (2011), Circular Economy package (2015), European Strategy for Plastics in a Circular Economy (2018). • Updates of critical raw materials list and report on CRMs and circular economy (2018). • FLEGT action plan against illegal logging promotes Voluntary Partnership Agreements (and 2019 COM on deforestation which includes a commitment to present a legislative

	conserving biodiversity and address potential negative impacts by systematically including it as part of trade negotiations and dialogues with third countries, by identifying and evaluating potential impacts on biodiversity resulting from the liberalisation of trade and investment through ex-ante Trade Sustainability Impact Assessments and ex-post evaluations, and seek to include in all new trade agreements a chapter on sustainable development providing for substantial environmental provisions of importance in the trade context including on biodiversity goals. 17c) The Commission will work with Member States and key stakeholders to provide the right market signals for biodiversity conservation, including work to reform, phase out and eliminate harmful subsidies at both EU and Member State level, and to provide positive incentives for biodiversity conservation and sustainable use.	proposal). • EU Timber Regulation obligations for operators placing timber and timber products on the market. • Expert Group on the EU Timber Regulation and the Forest Law Enforcement, Governance and Trade Regulation. • Encouragement of public procurement policies that specify trade in sustainable and verified legal timber. • Signing up to international biodiversity agreements as condition of Generalised Scheme of Preferences (GSP) and bilateral trade agreements. • EU Action Plan against Wildlife Trafficking (2016). • Business and Biodiversity Platform (B@B) sharing of best practices. • Following a scoping study (2018), the Commission initiated in 2019 the development of a methodology to better assess the impacts of trade liberalization on biodiversity in support of better integration of biodiversity in Sustainability Impact Assessments and ex post evaluations of EU FTAs. • The Commission is including biodiversity articles in Trade and Sustainable Development chapters of all new EU FTAs. • Biodiversity is also regularly addressed as part of TSD implementation.
18. Mobilise additional resources for global biodiversity conservation	18a) The Commission and Member States will contribute their fair share to international efforts to significantly increase resources for global biodiversity as part of the international process aimed at estimating biodiversity funding needs and adopting resource mobilisation targets for biodiversity at the 10th Conference of the Parties to the Convention on Biological Diversity in 2012. 18b) The Commission will improve the effectiveness of EU funding for global biodiversity inter alia by supporting natural capital assessments in recipient countries and the development and/ or updating of National Biodiversity Strategies and Action Plans, and by improving coordination within the EU and with key non-EU donors in implementing biodiversity assistance/projects.	• The EU significantly increased budgetary resources allocated to environmental issues via the Thematic Programme on Global Public Goods and Challenges (GPGC) under the Development Cooperation Instruments (including support for NBSAPs and resource mobilization plans), the Partnership Instrument and increased the proportion of funding directed to natural resources in the European Development Fund. • DEVCO led programs supporting biodiversity over 2014-2020. • The scope of external programming included Biodiversity and Ecosystem Services in Territories of European Overseas (BEST) funded initially as a preparatory action in 2010, then EU funded the BEST 2.0 Programme with a budget of 8 million EUR from 2015. • The Biodiversity for Life Flagship Initiative was used to bring together all EU-funded development cooperation projects and programmes that target biodiversity as a principal objective. • Strategies such as Larger than Elephants, Larger than Tigers, and Larger than Jaguars, define a strategic approach to halting biodiversity loss in Africa, Asia, and Latin America and the Caribbean respectively, including institutional strengthening and

		capacity building of national authorities and global action against wildlife crime, deforestation, and ecosystem function collapse.
19. 'Biodiversity proof' EU development cooperation	19) The Commission will continue to systematically screen its development cooperation action to minimise any negative impact on biodiversity, and undertake Strategic Environmental Assessments and/or Environmental Impact Assessments for actions likely to have significant effects on biodiversity.	• Guidance for Member States on Strategic Environmental Assessments and mainstreaming biodiversity and climate in development cooperation action (2017). • Development cooperation planned and delivered through National Indicative Programmes or Regional Indicative Programmes and Sector Policy Support Programmes.
20. Regulate access to genetic resources and the fair and equitable sharing of benefits arising from their use	20) The Commission will propose legislation to implement the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation in the European Union so that the EU can ratify the Protocol as soon as possible and by 2015 at the latest, as required by the global target.	• Regulation (EU) No 511/2014 on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization in the Union applicable since 12 October 2014. Commission Implementing Regulation (EU) 2015/1866 sets rules for the register of collections, monitoring user compliance and best practices. • The Commission sent letters of formal notice in January 2018 to nine Member States that were still non-compliant with the establishment of competent authorities and penalties for infringement of users' due diligence obligations under the Regulation ; by the end of 2020 all Member States were compliant. • The first Commission report on implementation of the regulation was published in 2017. • The ABS Expert Group set up under the Regulation met regularly and assist Member States with the implementation. • The Consultation Forum, gathering stakeholders from private and public sectors, also met regularly. • A Workshop in 2017 with participation from provider countries. • A guidance document on the scope of application and core obligation of the EU ABS Regulation was issued by the Commission in 2016,and a revised version was published in 2020).
Horizontal measures		
Partnerships for biodiversity	Reinforce cooperation and build effective partnerships with key sectors, including business, spatial planners and researchers and society at large; also • The EU outermost regions and overseas countries and territories (through the BEST initiative); • Developing countries (in implementing the TEEB recommendations) and EU candidate countries;	• Common Implementation Framework (CIF) set out a governance structure to support the delivery of the Strategy under the EU Nature Directors meetings (NDM). The Coordination Group for Biodiversity and Nature (CGBN) was set up as the main Expert Group to steer implementation of the Strategy with sub-groups dealing with a range of topics. • A range of Partnerships were set up under Target 1 (see Action 1) and Target 2 (see Actions 5, 6 & 7).

	• Biodiversity-related Conventions.	• EU Business and Biodiversity Platform (B@B platform) supported by the Commission to encourage active involvement of businesses in the implementation of the Strategy. • Global: Biodiversity for Life (B4Life) initiative (see Action 18). EU participated in the Critical Ecosystems Partnership Fund (CEPF) with EUR 20 million, Wealth Accounting and the Valuation of Ecosystem Services (WAVES) global partnership headed by the World Bank with EUR 2.5 M. Joint Communication on International Ocean Governance (2016).
Mobilising funding resources	The Commission and Member States will work to ensure a better uptake and distribution of existing funds for biodiversity, rationalise available resources and maximise co-benefits of various funding sources, including funding for agriculture and rural development, fisheries, regional policy and climate change, and diversify and scale up various sources of funding. The Commission and Member States will promote the development and use of innovative financing mechanisms, including market-based instruments, public private partnerships, and the possible establishment of a biodiversity financing facility. The potential of biodiversity offsets to ensure no net loss of biodiversity and ecosystem services will be explored. Member States to develop multi-annual planning for Natura 2000, consistent with the prioritised action frameworks. Responses to the COP10 commitment to increase substantially financial resources from all sources for effective implementation of the Nagoya outcomes set out in national biodiversity strategies and action plans (NBSAPs).	• EU funding instruments under the Multi-annual financial framework for the period 2014-2020 integrated biodiversity priorities and measures. • European Court of Auditors assessed use of ERDF funds for biodiversity in 2014, EMFF in 2020, agri-environment in 2011, and CAP funds overall in 2020. • Common Framework for Biodiversity-Proofing of the EU funds (2014). • LIFE programme prioritised targets 1, 2, 3, 4 and 5 and funded information and awareness raising campaigns under information & governance priority area. • LIFE funding for nature and biodiversity was increased by 10% in 2018-2020 following the Action Plan for People, Nature, and the Economy. • 7th FP and then Horizon 2020 funding for research and innovation projects focusing on biodiversity and ecosystem services. • Commission developed biodiversity financing and tracking methodology for the major EU funds and applied from 2017 onwards. • EIB set up Natural Capital Financing Facility (NCFF) for pilot projects promoting the preservation of natural capital in 2014, European Fund for Strategic Investments (EFSI) for large restoration investments in 2015. • See Action 2 for funding resources for Natura 2000. See partnerships and Action 18 for increase in development cooperation funding resources for biodiversity.
Building biodiversity knowledge	Commission will work with Member States and the European Environment Agency to develop an integrated framework for monitoring, assessing and reporting on progress in implementing the Strategy. The Biodiversity Information System for Europe (BISE) web portal will be the main platform for data and information sharing. National, EU and global monitoring, reporting and review obligations will be improved and streamlined as far as possible with requirements under other environmental legislation, such as the Water Framework Directive.	• EU 2020 Biodiversity baseline was established in 2010 and revised in 2015, used in the mid-term review to measure progress in reaching targets as well as in the final evaluation of the EU Biodiversity Strategy. • Biodiversity Information System for Europe (BISE) as single-entry point for published data and information supporting the implementation and monitoring of the EU Biodiversity Strategy 2020. • Update and development of EU SEBI biodiversity indicators. • EU Mapping and assessment of ecosystems and their services (MAES) and Knowledge Innovation Project for Integrated Natural Capital Accounting (KIP-INCA initiatives) –

	The EU 2020 biodiversity baseline and the updated EU biodiversity indicators will be key components of Shared Environmental Information System and Global Monitoring for Environment and Security, the EU Forest Data Centre and the LUCAS Land Use Cover Area Frame Survey. EU will remain closely involved in and contribute actively to the new intergovernmental science-policy platform on biodiversity and ecosystem services (IPBES), particularly to work on regional assessments.	see Action 5. • TRAIN and Eurostat grants to support MS in MAES and accounting. EU support for science-policy interfaces: IPBES, EKLIPSE, Biodiversa. • Global knowledge: Digital Observatory for Protected Areas (DOPA) developed by JRC to assess, monitor, and forecast biodiversity in protected areas globally. • EU funded setup of regional observatories of biodiversity and protected areas - BIOPAMA (in ACP countries), OFAC (in central Africa), and BID (to improve quality and use of scientific information related to biodiversity for decision-making). • MAES OR OCT EP pilot project on mapping and assessing the state of ecosystems and their services in the outermost regions and overseas countries and territories.

ANNEX 8 – KEY INSIGHTS FROM THE CASE STUDIES IN 10 MEMBER STATES

As part of the support study to the evaluation of the EU Biodiversity Strategy to 2020, surveys and interviews with national authorities, stakeholders and experts were carried out from November 2020 to March 2021 in ten EU Member States. The aim was to identify and learn about efforts made in different national contexts, provide examples of successful approaches and challenges as well as explore the views of different stakeholders on the implementation process. **The findings from these surveys are in no way assessments of how well any of these Member State performed in implementing the Strategy.**

The purpose of the national surveys was to provide insights into (i) national approaches to the implementation of the EU Biodiversity Strategy to 2020 in different Member States, (ii) views of national and regional stakeholders on the implementation process and results, (iii) examples of what worked well and what didn't, and (iv) reflections of key stakeholders on the likely factors of success and failure, and on the impacts of the Strategy on the ground.

Several criteria were applied to select ten Member States with a balanced representation of different national contexts, including: biogeographical region, date of accession, available evidence on biodiversity implementation initiatives and measures, and relevance of national context in relation to the selected biodiversity targets. Each national case study covered national implementation efforts across all EU biodiversity targets, as well as a more focused assessment of 2 to 3 selected biodiversity targets.

The following Member States were selected: Bulgaria (with emphasis on Targets 1, 3a and 5), Finland (with emphasis on Targets 2, 3b, 4 and 5), Germany (with emphasis on Targets 2, 3a and 5), Greece (with emphasis on Targets 2, 3a and 3b), Italy (with emphasis on Targets 2 and 4), Lithuania (with emphasis on Targets 3b and 4), the Netherlands (with emphasis on Targets 1, 2 and 4), Romania (with emphasis on Targets 1, 3a and 3b), Slovakia (with emphasis on Targets 1 and 2) and Spain (with emphasis on Targets 1 and 4).

Each case study included the following elements:

- Document review: official publications, scientific papers, stakeholder positions and other documents were examined in order to gain an overview of the national framework and approaches to implementation and monitoring, as well as to identify relevant examples.
- Online survey: the survey, translated in all national languages, was open for stakeholder input from September 2020 to January 2021 on the webpage of the contractor. It invited respondents to provide: (i) examples of implementation successes and difficulties, and their views on the factors that underpin them; (ii) evidence of costs and benefits of implementation; and (iii) views on the Strategy's relevance to national biodiversity needs and its added value. Authorities and stakeholders were actively invited to contribute.
- Stakeholder interviews: in each of the selected Member States, five representatives of national or regional authorities, stakeholder organisations or experts were identified and interviewed. The interviews were carried out in the format of a free conversation while the interviewers followed a broadly defined pattern to understand (i) the stakeholder's role and activities in relation to biodiversity, (ii) positive experiences, (iii) challenges met, and (iv) views on their root causes.

Key findings from these national surveys and interviews are summarised below.

1. National Biodiversity Policy Frameworks

The Member States in the case studies have developed different national instruments translating the EU and global biodiversity targets to 2020. These included:

- Spain's Strategic Plan on Natural Heritage and Biodiversity (SPNHB) for 2011-2017 which set the overarching goal to halt the loss of biodiversity and the degradation of ecosystem services, and to address their restoration. A monitoring system with indicators measured progress towards the national and EU targets. The Ministry for the Ecological Transition and Demographic Challenge (MITECO) prepared and published, in collaboration with the autonomous communities and other bodies, annual reports[271] with values and interpretation of the indicators. The Plan was not updated following its completion in 2017 until 2020[272].
- The Italian National Biodiversity Strategy (NBS) released in 2010, and updated in 2016 in line with the objectives of the EU Biodiversity Strategy to 2020[273]. It defined 3 national strategic targets on: 1) Biodiversity and ecosystem services, 2) Biodiversity and climate change, and 3) Biodiversity and economic policies and specific targets and priority measures for 15 work areas. The Ministry of the Environment published an implementation report every two years[274,275] and a mid-term review in 2016[276], with a set of indicators on the state of biodiversity and on the effectiveness of actions[277].
- The national Strategy for Biodiversity for 2014-2029 of Greece is the primary biodiversity-related policy instrument in the country, closely following the structure and rationale for the Aichi targets and operationalised by 5-year Action Plans[278].
- The National Biodiversity Strategy[279] of Germany sets biodiversity objectives and actions to 2020, with 330 concrete and often quantified targets with target years ranging from 2010 to 2020, and around 430 measures that should encourage action from state and non-state actors. In 2015, the Federal Ministry of Environment, Nature Conservation and Nuclear Safety (BMU) launched the Nature Conservation Initiative 2020 to step up efforts to achieve the biodiversity targets in ten priority action areas in relation to arable land and grassland, coastal and marine areas, alluvial areas/floodplains, wilderness, protected areas, Natura 2000 and biotope network, city green, international responsibility, knowledge and understanding and financing. The 2016 national strategy on biodiversity aspects in the federally owned areas of Germany[280,281] details how the national biodiversity strategy is being implemented in these areas. Progress on the national strategy and on the Nature Conservation Initiative are reported in Germany's 6th national report to the CBD (2020) and in the national indicator reports (most recently published in 2017 and 2020). Fourteen out of the sixteen Länder have adopted their own biodiversity

[271] https://www.miteco.gob.es/es/biodiversidad/temas/inventarios-nacionales/inventario-espanol-patrimonio-natural-biodiv/informe_anual_IEPNB.aspx
[272] The Environmental Implementation Review – Country Report Spain (European Commission, 2019).
[273] https://www.minambiente.it/pagina/strategia-nazionale-la-biodiversita
[274] First period (2011-12) Report on the implementation and efficacy of the Strategy (MATMM, 2014).
[275] Fourth period (2017-18) Report on the implementation and efficacy of the Strategy (MATMM, 2020).
[276] Mid-term review - Third period (2015-16) Report on the implementation and efficacy of the Strategy (MATMM, 2018).
[277] https://www.minambiente.it/sites/default/files/archivio/allegati/biodiversita/snb_set_preliminare_indicatori_strategia.pdf
[278] CBD (2019). Greece – Sixth National Report.
[279] BMUB (2007) National Strategy on Biological Diversity, Berlin, Germany: Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMU) - Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.
[280] Strategie zur vorbildlichen Berücksichtigung von Biodiversitätsaspekten für alle Flächen des Bundes (Ströff).
[281] BMU (2016) Naturschutzstrategie für Bundesflächen: Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit.

strategies and/or action plans to be in line with the national ambitions; however, progress on their implementation is unknown[282].

- In Lithuania, the National Sustainable Development Strategy, the National Environmental Protection Strategy and the National Action Plan for Biodiversity and Landscapes have been the main horizontal instruments that set targets for the conservation and sustainable use of biodiversity. The National Environmental Protection Strategy (2015) emphasises four priority areas: 1) the sustainable use of natural resources and waste management; 2) the improvement of the quality of the environment; 3) the maintenance of the stability of ecosystems; and 4) mitigation and adaptation to climate change.
- Romania's National Biodiversity Strategy and Action Plan (NBSAP) 2014-2020[283] sets the general strategic framework for biodiversity and nature protection, identifying strategic objectives and corresponding actions to be implemented by 2020.
- Bulgaria's national legislative framework directly related to biodiversity conservation is based on the Biodiversity Act and the Environmental Protection Act[284], supported by further legislative and policy instruments.
- The main strategic biodiversity documents in the Slovak Republic included the updated National Strategy for Biodiversity Protection until 2020 (2014) and the Action Plan for Implementation of Measures Resulting from the Updated National Strategy for Biodiversity Protection until 2020 (2014).
- The main policy instruments implementing the global and EU biodiversity targets to 2020 in the Netherlands are the Natural Capital Agenda[285] (including 16 actions that covered most, but not all, EU biodiversity targets), a Nature Pact implementation agreement[286] between the national and provincial authorities (with a focus on the National Ecological Network (NNN), agricultural nature management and species' protection as well as ecological measures under the EU Water Framework Directive), and the National Nature Vision[287] adopted in 2014.

2. Insights on successes and challenges from national implementation

➢ *Target 1*

Success examples:

- Significant advances have been made in the designation and management of Natura 2000 sites. The terrestrial Natura 2000 network is almost completed in most Member States. In Spain, the total marine area designated as Natura 2000 increased from 1% to 8% between 2013 and 2016, while the terrestrial Natura 2000 area increased by about 10% and is almost completed[288], and by 2018, management plans were elaborated for the majority of Special Protection Areas (67%) and Special Areas of Conservation (77%). In Italy, 97% of SCIs were designated as SACs by the end of 2020[289] (100% in the Calabria Region), and all of them have general and specific conservations measures adopted. For more than 90 % of habitats, conservation measures have been identified and taken. Since 2018, Greece has increased the marine Natura 2000 network

[282] BMU (2017) Biologische Vielfalt in Deutschland Rechenschaftsbericht 2017: Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit.
[283] Ministry of Environment (2014), Strategia națională și Planul de acțiune pentru conservarea biodiversității 2014-20.
[284] Ministry of Environment and Water. Sixth National Report 2014-18 to the Convention on Biological Diversity.
[285] Government of the Netherlands (2013) Uitvoeringsagenda Natuurlijk Kapitaal.
[286] Ministerie van EZ & IPO (2013) Natuurpact ontwikkeling en beheer van natuur in Nederland, Den Haag.
[287] https://www.rijksoverheid.nl/documenten/rapporten/2014/04/01/rijksnatuurvisie-2014
[288] http://atlasnacional.ign.es
[289] https://www.minambiente.it/pagina/sic-zsc-e-zps-italia

from 6% to 19.6% of total marine area (however, most of these areas are not effectively managed yet[290]). The Natura 2000 network in Germany covers 15.5% of the terrestrial and 45% of the marine area in 2020 and is considered to be almost complete for terrestrial sites and 100% complete for marine sites (by the beginning of 2020, legal protection has been secured for over 98% of the SACs and conservation measures have been defined for approximately 85% of the sites, mainly via management plans[291]). The designation of Important Bird Areas as SPAs has been completed in Bulgaria, however, there is a considerable delay in the designation of Sites of Community Importance as SACs. Slovakia's terrestrial Natura 2000 network is virtually complete. In the Netherlands, all SCI were designated as SACs by 2018 and management plans are in place for all Natura 2000 sites except the 4 marine sites in the Exclusive Economic Zone (EEZ)[292].

- The status of emblematic species has improved thanks to conservation actions, often with support from the EU LIFE Programme (e.g. the recovery of populations of Lynx pardinus and the Cantabrian brown bear in Spain; the brown bear and the wolf in Italy; the chamois and griffon vultures in Bulgaria, the common crane, white tale eagle and osprey in the Netherlands). Progress in the improvement of conservation status of habitats has been mostly localised (e.g. Alpine streams in Germany[293]).
- Most Member States have published red lists and national and regional inventories of terrestrial and marine species and terrestrial habitats (numerous examples provided in the case studies of Spain, Italy[294], Germany). Databases have been created at the regional level for Appropriate Assessment (AA) procedures and Natura 2000 sites' management[295].
- Monitoring has been put in place for threatened and protected species, and there are some initiatives to monitor the impacts of climate change on protected areas (e.g. in Spain). Data from monitoring programmes carried out by scientific societies, institutions and amateurs are increasingly converging and being organised in georeferenced and expert validated databases, at both local and national scales (e.g. www.ornitho.it for birds, the Nature Directives reporting database[296] and the web portal "NaturaItalia" in Italy, a national habitat monitoring system in Lithuania[297], a comprehensive Information and Monitoring System www.biomonitoring.sk in Slovakia).
- Partnerships and networks of actors have been developed to share information and experiences and cooperate, such as the Information and Environmental Education (INFEA) system with its territorial organizations in Italy[298] or collaboration with energy companies in protected areas.
- Networks of protected areas have been implemented to manage and enhance Natura 2000 as an ecological network, and counteract fragmentation (e.g. "Networks of reserves"[299] in Trentino with support from the LIFE Programme).

Examples of gaps and challenges:

[290] EC (2019). The Environmental Implementation Review 2019. Country Report Greece. SWD(2019) 138 final.
[291] BfN input to the survey.
[292] Bij12 (2021) Webpage 'Natura 2000 beheerplannen'.
[293] Bundesamt für Naturschutz (2019) Nationaler Bericht 2019 gemäß FFH-Richtlinie.
[294] The Environmental Implementation Review – Country Report Spain (European Commission, 2019).
[295] https://www.sivic.servizirl.it/vic/#!/homePublic
[296] www.reportingdirettivahabitat.it
[297] https://am.lrv.lt/lt/veiklos-sritys-1/saugomos-teritorijos-ir-krastovaizdis/igyvendinti-projektai

[298] 6th National report to the CBD – Italy (Convention of Biological Diversity, 2019.
[299] Provincial law n. 11/2007, art. 47.

- Many Natura 2000 sites still lack conservation objectives and measures, and non-compliance and new developments adversely impact Natura 2000 areas. (Survey inputs from authorities and environmental NGOs in Spain, Italy, Greece).
- Despite local successes, terrestrial and freshwater species and habitats show a critical situation across most Member States. Another remaining challenge in relation to full implementation of the Birds- and Habitats Directives is protection outside of Natura 2000 sites. The short term trends of a high number of populations are unknown.
- Conflicts with local actors have followed successful species reintroductions, for example of the ferreret *Alytes muletensis* in the Serra de Llevant Natural Park and raptors in the Mondragó Natural Park on the Balearic Islands, or the brown bear in some areas (survey inputs from regional authorities in Spain).
- EU guidelines on the management of Natura 2000 forests[300] are sometimes in contradiction with national and regional forest management practices and forest management guidelines, for example regarding wildfire risks or pest control (Spanish regional forest association).

Factors influencing success and failure:

- Financial and human resources: funding has been insufficient for species and habitat conservation measures across the case study Member States, and limited capacities of nature protection authorities have been raised in a number of case studies (e.g. in Italy, Romania, Slovakia).
- Strategic integrated approach and governance: competences for nature conservation and for the sustainable use of land are divided (Spanish regional authorities and environmental NGOs).
- Participatory process: not all stakeholders have been consulted or involved in the development of Natura 2000 management plans (inputs from Spanish associations of farmers, foresters and fishermen, Lithuanian forestry stakeholders, Romanian authorities and forestry stakeholders). In 2020, the Ministry of Environment, Waters and Forests initiated a dialogue with relevant stakeholders from the forestry sectors to help develop and discuss future forest policy[301].
- Enforcement: due to EU's infringement proceedings, governments are pursuing the with high priority completion of management plans in Natura 2000 areas (e.g. Greece) and the completion of designations of Natura 2000 sites (e.g. in Lithuania, Romania). Illegal practices (such as illegal logging in Romania) continue to be a threat to Natura 2000.
- Knowledge: monitoring and knowledge gaps on the status of habitats and species and on pressures remain, and they affect the quality of management plans (inputs from national and regional authorities in a number of case studies)
- Awareness: negative attitudes to carnivores partly stem from insufficient information about co-existence with emblematic species (environmental NGOs in Spain, survey inputs in Slovakia, Lithuania, the Netherlands).
- Administrative burden: authorities have noted that reporting under the Habitats and Birds Directives has been extremely difficult to apply due to the requested level of precision and data. (Regional authority in Italy). One of the hindering factors to apply for biodiversity support measures, as identified by interviewees in Slovakia, has been the high demand for paperwork.
- Land use: according to stakeholders and authorities interviewed in the German case study, the most necessary change to improve the conservation status of species and habitats, alongside

[300] https://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm
[301] Forest policy consultation (2020).

better financing and resource provisioning, is to change land use and management, especially focusing on agriculture, in areas within or in proximity to Natura 2000 sites.

- Land ownership in Natura 2000 sites is often complex, involving numerous private owners and users, making both monitoring and conservation measures difficult. Acquisition of land, or agreeing on nature management agreements, is additionally hampered by compensation levels deemed to be insufficient for land owners and users to adapt their business-model (evidence from regional authorities, farmers associations, research and environmental organisations in Italy, Germany, the Netherlands, Lithuania)[302].

➢ ***Target 2***

Success examples:

- Significant progress has been made in the development of biodiversity knowledge, including inventories and catalogues (e.g. inventories of marine biodiversity, wetlands, forests, an inventory of Natural Heritage and Biodiversity in Spain[303,OBJ]).
- All Member States have progressed in the mapping and assessment of ecosystems and their services on their territories, under the EU MAES initiative[304] and with support from LIFE and Horizon 2020 projects[305,OBJ,306,OBJ,307,OBJ,308,OBJ] has been developed (however, an integrated environmental and economic accounting system is still in its infancy). In Bulgaria, the MetEcoSMAP project has supported the development of a national methodological framework and the mapping and assessment of ecosystems and their services in [309,OBJ].
- Examples of measures to restore habitats, promote ecological connectivity and develop green infrastructure have been highlighted in survey responses.
    - In Italy, many municipalities have implemented ecosystem restoration, urban regeneration and greening with EU funding and in collaboration with public and private organizations and stakeholders (for example the H2020 project Urban Green Up, or the LIFE-funded GAIA Urban Forestry project, the Veneto ADAPT LIFE project, Soil4LIFE or the LIFE project "Sic2Sic" to promote citizen participation in nature protection). In the Calabria region, restoration of degraded ecosystems has exceeded the 15% target set by the EU Strategy. In Lombardy region, the restored Park of San Colombano is one of the widest riparian woods of the Po, accessible to the population and local associations.
    - Germany was one of several Member States that published a Prioritisation Framework for ecosystem restoration in 2015, and carried out some large-scale restoration of rivers and

[302] PBL (2017) Lerende evaluatie van het Natuurpact: naar nieuwe verbindingen tussen natuur, beleid en samenleving.
[303] Follow up Report of the Strategic Plan for Natural Heritage and Biodiversity (MITECO, 2017).
[304] https://biodiversity.europa.eu/countries/greece/maes
[305] Dimopoulos, P.; Drakou, E.; Kokkoris, I.; Katsanevakis, S.; Kallimanis, A.; Tsiafouli, M.; Bormpoudakis, D.; Kormas, K.; Arends, J. The need for the implementation of an Ecosystem Services assessment in Greece: Drafting the national agenda. One Ecosyst. 2017, 2
[306] Albert, C., Burkhard, B., Daube, S., Dietrich, K., Engels, B., Frommer, J., Götzl, M., Grêt-Regamey, A., Job-Hoben, B., Keller, R., Marzelli, S., Moning, C., Müller, F., Rabe, S.-E., Ring, I., Schwaiger, E., Schweppe-Kraft, B. and Wüstemann, H. (2015) Development of national indicators for ecosystem services: recommendations for Germany, Bonn-Bad Godesberg, Germany: Bundesamt für Naturschutz - Federal Agency for Nature Conservation, BfN-Skripten 411.
[307] Albert, C., Neßhöver, C., Schröter, M., Wittmer, H., Bonn, A., Burkhard, B., Dauber, J., Döring, R., Fürst, C., Grunewald, K., Haase, D., Hansjürgens, B., Hauck, J., Hinzmann, M., Koellner, T., Plieninger, T., Rabe, S.-E., Ring, I., Spangenberg, J. H., Stachow, U., Wüstemann, H. and Görg, C. (2017) 'Towards a National Ecosystem Assessment in Germany: A Plea for a Comprehensive Approach', *GAIA - Ecological Perspectives on Science and Society*, 26(1), pp. 27-33.
[308] Albert, C., Neßhöver, C., Wittmer, H., Hinzmann, M. and Görg, C. (2014) Sondierungsstudie für ein Nationales Assessment von Ökosystemen und ihren Leistungen für Wirtschaft und Gesellschaft in Deutschland: Helmholtz-Zentrum für Umweltforschung – UFZ.
[309] http://www.sopsr.sk/files/hodnota-ekosys.pdf

floodplains, as well as programmes and initiatives such as Germany's Blue Belt[310], the nationwide flood protection programme[311] [312] [313] [314] [315] [316] [4]) the federal government has become active on the topic and developed a dedicated insect programme as part of the GAK.

- Lithuania is considering decommissioning of obsolete river barriers not fulfilling socio-economic criteria (study by the Ministry of Environment).
- Successful restoration projects in Bulgaria have been financed under the LIFE programme and include NaturAll LIFE - NaturAll LIFE, Restoration and sustainable management of Imperial Eagle's foraging habitats in Natura 2000, Safe Ground Redbreasts, LIFE IAS Free Habitats.
- Restoration of old oxbow lakes system with particular hydro meliorations canals in Medzibodrožie, Slovakia[317] and the well-developed concept of green infrastructure in the form of the concept of a Territorial System of Ecological Stability[318].
- The Netherlands commissioned a quick scan for national restoration opportunities[319] in 2014 but didn't publish an RPF. Restoration measures in the NNN are mostly related to the removal of built-up nitrogen through vegetation and soil removal, and hydrological measures to increase the resilience of remaining habitats[320]. In the Multi-annual Programme Defragmentation (2004-2021), the national government worked with ProRail and provinces to reconnect natural areas, e.g. creating by wildlife passages or tunnels[321]. The Netherlands approach to flood risk management - 'room for the river' - is focused on creating more space for flooding rather than further raising dikes where possible. The two largest multi-annual programmes 'Ruimte voor de Rivier' (2006-2019, EUR 2.3 billion) and 'Maaswerken' (1997-2018, EUR 1.5 billion) implemented large-scale projects in nearly 100 locations on the Rhine- and Meuse river systems, recreating thousands of hectares of riverine nature areas resulting in significant biodiversity improvements[322]. Important steps to restore river connectivity also taken 2010-2020[323]. An agreement between Belgium, The Netherlands and Luxembourg to overcome all barriers in all river basins by 2027 significantly scaled up action. This included green light on some far-reaching measures such as the partial re-opening of the Haringvliet[324] and the 3 km long 'Fish Migration River' through the Afsluitdijk dam. Other large and innovative ecosystem recreation projects are: the '*Sand Motor*'[325] (natural marine currents recreating a large

[310] BVI and BMU (2017) Bundesprogramm Blaues Band Deutschland, Berlin.
[311] Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (2014) Nationales Hochwasserschutzprogramm.
[312] BfN (2017) Bundeskonzept Grüne Infrastruktur- Grundlagen des Naturschutzes zu Planungen des Bundes, Bonn: Bundesamt für Naturschutz.
[313] Bundesregierung (2014) Antwort der Bundesregierung: Grüne Infrastruktur – Nutzen für Mensch und Tier, Berlin.
[314] BMU (2014) Presseinformation Stand der Umsetzung von Maßnahmen des Bundesprogramms Wiedervernetzung
[315] Ministerium für Verkehr Baden-Württemberg (2019) Wiedernetzung.
[316] Ministerium für Verkehr Baden-Württemberg (2015) Landeskonzept Wiedervernetzung an Straßen in Baden-Württemberg
[317] Stakeholder survey results.
[318] Filčák, R., Považan, R., Adamec, M., Dokupilová, D., Chrenko, M., Izakovičová, Z., Kadlečík, J., Szemesová, J., Špulerová, J. and Šťastný, P., (2017). Environmental Development Scenarios 2020+. Sustainable growth in the context of biodiversity protection and climate change (short-term prospective study). Centre for Social and Psychological Sciences, Slovak Academy of Sciences, organizational unit Prognostic Institute of the Slovak Academy of Sciences.
[319] WUR (2015) Ecosysteemherstel in Nederland: een quick-scan naar kansen.
[320] Bij12 (2021) Webpage 'Herstelmaatregelen in beeld'.
[321] MJPO (2020) Eindboek Meerjarenprogramma Ontsnippering Natuur verbonden, meer leefruimte voor dieren in Nederland.
[322] See for example Straatsma M. et al (2017) Biodiversity recovery following delta-wide measures for flood risk reduction. Science Advances 08 Nov 2017: Vol. 3, no. 11, e1602762 DOI: 10.1126/sciadv.1602762.
[323] RWS (2020) Webpage 'Make way for fish'.
[324] State Forest Service and partners (2018) Website *Haringvliet.nu*.
[325] RWS & Provincie Zuid-Holland (2021) Website the Sand Engine.

sandbank to aid coastal protection), and '*Marker Wadden*'[326] creating islands, marshes and mudflats in one of the country's largest freshwater lakes.

- Biophysical and monetary assessments of ecosystem services have stimulated projects aiming to improve the conservation status of ecosystems (e.g. in Italy). The Netherlands made significant progress in the development of national natural capital accounts[327] and a publicly accessible Atlas Natural Capital was launched in 2015[328]. In 2015 a TEEB[329] city tool was launched for municipalities[330]. The Netherlands Knowledge Network Development and Management Nature Quality allows researchers, conservation site managers, universities, consultancies, NGO's, and governmental bodies to closely cooperate to restore ecosystems[331].

Examples of gaps and challenges, and factors influencing success and failure:

- Strategic approach: potential areas for restoration and green infrastructure still need to be mapped and discussed with stakeholders in order to reconcile land uses and plan restoration. Strategies for green infrastructure and prioritised action frameworks for restoration are not developed in most Member States[332]. Systematic data on degraded and restored surfaces has generally been insufficient to set a baseline and track progress to the 15 % restoration target.
- Although in several Member States a coordinated effort was made to prioritise restoration efforts, limited progress has been made on the ground. Wetlands and freshwater ecosystems have been declared as restoration priorities by a number of Member States (Germany, the Netherlands), other ecosystems have received less attention, and there is no comprehensive evidence of the success of restoration at the national or regional level. This is exacerbated by continued pressures on ecosystems, e.g. due to extraction and drainage, and climate change.
- The non-binding nature of the EU restoration targets has resulted in a low level of implementation (Survey inputs from environmental NGOs and some authorities in a large number of the surveyed Member States).
- High fragmentation of land of ownership poses challenges, and the complexity of involving private owners for restoration have not been sufficiently tackled. (Survey input from environmental NGOs, regional sector associations and regional authorities in Spain, Italy, Germany[333]).
- There have been insufficient budgets for restoring degraded ecosystems, in particular outside of protected areas. Insufficient funding in general has led administrations to prioritise other objectives and actions over biodiversity urgencies (inputs from national and regional administrations).
- Specific challenges have been faced in some Member States, e.g. the protection of historical city centres poses constrains on the green infrastructure development in Italian towns. The uncritical application of monetary valuation methods can be dangerous, especially in the evaluation of regulating ecosystem services. (National public research institution in Italy).

[326] Natuurmonumenten (2021) Webpage on the Marker Wadden.
[327] Netherlands Statistics (CBS) web portal on Natural Capital.
[328] Web portal 'Atlas Natuurlijk Kapitaal'.
[329] TEEB = The Economics of Ecosystems and Biodiversity.
[330] Website TEEB city The Netherlands.
[331] OBN (2021) OBN Knowledge Network introduction.
[332] The Green Tank (2020) «Προτεραιότητα στη φύση: Αξιολόγηση της υλοποίησης της Εθνικής Στρατηγικής για τη Βιοποικιλότητα».
[333] Pers. Comm. Interviews NABU and management authority Schleswig-Holstein.

➢ ***In relation to Target 3***

Success examples:

- Adoption and implementation of national and regional strategies and plans for organic agriculture (for example in Spain[334]; in Italy there has been a large increase of CAP support to organic production and investment in landscape elements such as drystone walls, buffer strips and ponds close to agricultural land, and in Bulgaria areas under organic farming have seen an increase of 197% between 2012 and 2020[335]).
- Coordinated rural development interventions have supported many farmers in increasing ecological connectivity. Many small farms have benefited from CAP support measures to apply sustainable practices in Natura 2000. (Spanish agroecology association, regional authorities in Italy). Around half of Romania's high nature value grassland (1.2 million ha) were protected by granting financial compensation to farmers applying management requirements[336].
- Cooperation between farmers, authorities, research and non-government organisations to recover traditional local agricultural varieties and livestock breeds (e.g. in the Valencia Region in Spain, the German rural development programmes and the GAK framework).
- Initiatives to promote sustainable farming and food systems (Italy's "biodiversity park" at EXPO 2015 and Mountain Agriculture Forum in 2017).
- Examples of successful projects: in Germany: the F.R.A.N.Z pilot project[337], LIFE projects Wiesenvögel Life in Niedersachsen[338] and Life Limosa in Schleswig-Holstein[339]; LIFE Integrated Nature project NATURALIT (Lithuania).
- The development of sustainable forest management plans in public and private forests has continued its slow but constant increase[340]. In Lithuania, all state forests and almost a third of private forests are covered by management plan. Best conservation practices have been supported through financing and compensation mechanisms in some Member States[341,]. Germany's indicator report for the national biodiversity strategy, the sub-indicator for species diversity and landscape quality in forests has shown a positive trend and lies within the target area.

Examples of gaps and challenges:

- Unsustainable agriculture practices remain one of the main threats to biodiversity[342, 343]. In Germany, butterfly [344]. Bulgaria is among the Member States with the highest loss of High Nature Value farmland (~0.2% of the Utilised Agricultural Area) due to the intensification of agriculture.

[334] https://www.mapa.gob.es/es/alimentacion/planes-y-estrategias/Estrategia%20Apoyo%20Producci%C3%B3n%20Ecol%C3%B3gica_tcm30-79287.pdf
[335] Eurostat, 2017. Organic farming statistics.
[336] European Commission (2019), The Environmental Implementation Review 2019. Country Report Romania.
[337] Umweltstiftung Michael Otto (2021) F.R.A.N.Z.
[338] Wiesenvögel LIFE (2011) Lebensräume von Wiesenvögeln sichern: Niedersachsen übernimmt Verantwortung.
[339] European Commission (2012) LIFE LIMOSA.
[340] http://www.observatoriforestal.cat/propietat-i-planificacio/
[341] For example the LIFE Biorgest Project.
[342] ΕΚΠΑΑ (2019). Φύση-Βιοποικιλότητα. Επικαιροποίηση Έκθεσης Κατάστασης Περιβάλλοντος 2018 (Nature-Biodiversity. Update of the State of the Environment Report 2018.
[343] The final report on the implementation of the national strategy for Biodiversity in 2020, currently being prepared by MATTM.
[344] Umweltbundesamt (2018) Überschreitung der Belastungsgrenzen für Eutrophierung.

- Agriculture in most case studies remains marked by intensive and specialised models. Measures supporting agricultural intensification with potential negative impacts have been promoted through EU and national funds. (Respondents to survey across the Member States)
- Although an increasing share of forests are covered by management plans, many are outdated, and not all integrate biodiversity restoration measures (especially if they are not protected under the Natura 2000 network). For example in Lithuania, NGOs have pointed to intensified logging and practices damaging for biodiversity in private forests. Evidence indicates that there is a low uptake of rural development measures and a low number of projects that target biodiversity in forests across the case study Member States. In terms of financing mechanisms to maintain and restore forests, payments for ecosystem services or other innovative mechanisms have not been deployed at any significant level.
- There are no comprehensive and agreed indicators and thresholds to assess the impact of agricultural and forest management, direct payment schemes and rural development programmes on biodiversity (Regional forest association in Spain, regional authority in Italy).

Factors influencing success or failure:

- Studies indicate that pesticide use, factors affecting farmer's uptake of biodiversity measures and insufficient effectiveness of the rural development programmes are the main barriers to biodiversity conservation[345].
- Respondents across the board considered that nationally programmed measures, funds and uptake have been insufficient to incentivise sustainable land and forest management, agroecological practices and organic production (which has e.g. only received the minimum CAP support in Spain). A review of the EFA options selected by farmers in Germany in the first two years concluded that the conservation effect of the EFAs has been limited largely because farmers have the option of selecting types of EFAs that are easy to implement but that have little to no impact on biodiversity, and farmers have a low risk of incurring penalties[346].
- Difficulties in accessing compensation for restrictions in Natura 2000 sites have been a topic mentioned in survey inputs from stakeholders across the Member States. Further issues raised by respondents include heavy administration and difficult access to funding for small farmers who often make the highest contribution to the protection of biodiversity; non-activation by the Regions of the 2000 Natura support measures; too low premium ceilings[347] and unclear rules for access to allowances in relation to cross-compliance. (Survey responses from association of farmers associations, regional forest associations, agroecology association and environment NGOs in Spain, Italy, Greece, Germany, Romania). In Romania, greening is sometimes seen by farmers as a primarily bureaucratic exercise adding a layer of complexity to existing mandatory obligations and voluntary undertakings[348]. In some case studies (e.g. in Romania, Bulgaria), environment NGOs and sector stakeholders have raised concerns about the efficiency and transparency of spending.

[345] Joorman, I. and Schmidt, T. (2017) *Hindernisse und Perspektiven für mehr Biodiversität in der Agrarlandschaft*.
[346] Zinngrebe, Y., Pe'er, G., Schueler, S., Schmitt, J., Schmidt, J. and Lakner, S. (2017) 'The EU's ecological focus areas – How experts explain farmers' choices in Germany', *Land Use Policy*, 65, pp. 93-108.
[347] Pers. Comm. Interview management authority Schleswig-Holstein.
[348] Redman, M, and Barbu, R. (2017). Evaluation study of the payment for agricultural practices beneficial for the climate and the environment ("greening" of direct payments). Case study on Romania.

- Biodiversity provisions in the CAP have increased complexity and costs both for farmers and for administrators. (Farmers associations in Spain). Regional administrations have preferred easily controllable but less targeted measures (i.e. light green), while more high-nature value measures, that are not able to be as standardised and need to be adapted to specific species, have often been deprioritised[349]. (German case study.) In Lithuania, NGOs have pointed to Natura 2000 payments under RDP being conditional on foresters' signing contracts for biodiversity protection measures exceeding the period of compensation.
- Few incentives have been given to farmers for public services in favour of biodiversity, or to compensate limitations on agricultural activities by Natura 2000 site management plans. (Survey inputs from Spanish farmers and ranchers association.) However, such incentives can work for nature: in Greece, financial incentives have encouraged farmers to make use of protective mechanisms against damages inflicted by wild animals, with a positive impact on the recovery of large carnivore populations.
- Enforcement of legal protection: e.g. the failing obligation to prevent the deterioration and loss of permanent grassland in Germany has led action by the federal government, as well as formal notice by the Commission[350].
- Engagement: Species-specific conservation projects have been most sustainable when planned and executed in close collaboration with the land users. Cooperation between ornithologists and farmers has been key to protect nesting sites and rewet wetland areas, leading to measurable improvements in local and regional population trends. (German case study). Insufficient collaboration among actors in different sectors and insufficient engagement in the definition of protection measures has been raised by agriculture and forestry stakeholders in Spain, by respondents to the survey in Slovakia, and by forest owners and stakeholders in Lithuania (where the case study indicates very significant conflicts between conservation and forestry objectives).
- Successful projects have established extensive farming techniques on grassland to provide safe, undisturbed nesting sites for ground nesting birds, restored and protected moorlands, and deciduous forests. However, to effectively address the declining population trends, effective measures must be implemented at the landscape scale, and address the major causes of species decline. (German case study).

➢ ***In relation to Target 4***

Success examples:

- A number of commercial fish stocks are slowly increasing as a result of the implementation of fisheries management plans. Today three of the four most important commercial fish stocks in the North Sea for the Netherlands (herring, sole and plaice) are above safe biological limits and above sustainable levels[351].
- Measures are being developed and introduced to reduce damage to species and habitats from fishing activities, such as technical and other innovations for sustainable fisheries with fewer

[349] LANA (2016) Wirksamkeit der derzeitigen EU-Naturschutzfinanzierung in Deutschland und Anforderungen für die nächsten Förderperiode ab 2020. Germany: Länderarbeitsgemeinschaft Naturschutz, Landschaftspflege und Erholung LANA.
[350] European Commission Press Corner (2019) July infringement package: key decisions.
[351] Government of the Netherlands (2019) Environmental data compendium indicator page 'Fish stocks in the North Sea 1947-2019.

discards, and closing of some marine Natura 2000 sites for damaging forms of fishing (evidence in case studies from Italy, Spain, Germany, the Netherlands).

- The fisheries sector is increasingly involved in biodiversity conservation efforts. For example in Spain, the "Pesca Neta"[352] project has supported marine litter removal by fishermen, the «Avoid ghost fishing» project has recovered abandoned fishing gear along the Catalan coast in collaboration with fishermen, NGOs and scientists, reducing the risk of entanglement of organisms, ocean floor erosion and vectors of invasive species. Interreg-Med programme (2014-2020) has co-financed several initiatives that tackle marine litter[353].
- The European Maritime and Fisheries Fund has supported measures for the replacement of fishing gear with less impacting ones and interventions for the conservation of marine SCIs, with the contribution of fishermen.

Examples of gaps and challenges:

- The sustainable fishing target is not achieved for all fish stocks. Mediterranean and Black Sea fish stocks continue to be overexploited. A number of commercially exploited fish stocks remain in poor condition in the Baltic and in the North Sea[354]. Fish populations have decreased both in the Curonian Lagoon and Baltic Sea (Lithuania), mainly as a result of water pollution, changes in food abundance and invasive species[355].
- Bottom-disturbing fisheries, bycatch/incidental catches of sensitive species and continued over-fishing of shared fish stocks are identified as key challenges and continue to severely impact some protected species (such as the porpoise, long-lived shark and ray species), benthic organisms and habitats (such as *Posidonia* seagrass meadows) (evidence from case studies in Spain, Italy, the Netherlands).
- Big knowledge gaps in relation to marine biodiversity and impacts of human activities on ecosystems present further challenges to effective fisheries and marine management measures.
- Human impacts from urbanisation, energy infrastructure, chemical, nutrient and noise pollution and litter, transportation, tourism and recreation and other activities continue to degrade marine habitats, and have not been alleviated through protection (survey inputs from regional authorities and association of fishing enterprises in Spain, Germany, the Netherlands). Good environmental status of marine ecosystems has not been achieved[356].

Factors influencing success or failure:

- Knowledge gaps remain on marine ecosystems, pressures and impacts (environment NGOs, research organisations, national and regional authorities).
- Limitations on fishing to conserve marine biodiversity strongly impact on fishers' incomes (associations of fishing enterprises in Spain, Italy).
- Fishery stakeholders have expressed frustration with being insufficiently engaged in the definition of actions to preserve marine biodiversity, and with their efforts and positive contributions being insufficiently recognised. (Associations of fishing enterprises in Spain and Italy). On the other hand, Fisheries in Protected Areas (VIBEG) agreements, although initially

[352] https://pescaneta.com/
[353] http://www.etc.uma.es/mediterranean-biodiversity-interaction-with-marine-litter-new-knowledge-base/
[354] Bundesamt für Naturschutz (2019) Impacts on commercial species.
[355] CBD Country profile, Lithuania
[356] BMU (2016) MSFD Programme of Measures for Marine Protection in the German Parts of the North Sea and the Baltic Sea Report pursuant to Article 45h(1) of the Federal Water Act, Bonn Federal Ministry for Environment, Nature Conservation, Construction and Nuclear Safety.

not well-supported by the sector, provided an important platform to discuss and agree on more sustainable fishing measures in the Dutch part of the North Sea.

- Rules and restrictions to preserve marine biodiversity have not applied to all actors, for example third-country fleets, small-scale fishing boats (below 12 meters in length overall), and sectors other than fishing such as tourism, transport or extractive activities. This is diminishing the results from efforts undertaken to introduce more sustainable fishing practices (Associations of fishing enterprises in Spain, Italy).

➢ ***In relation to Target 5***

Success examples:

- Lists of invasive alien species (IAS) and systems to detect IAS have been put in place at national level, in regions and autonomous communities (Spain case study – inputs from regional authorities; in Italy, guidelines have been prepared for all IAS on the Union list; in Germany, a methodology is being applied to assess invasiveness and list species at national level)
- Pathways of introduction of IAS have been analysed, identified and prioritised in many Member States (e.g. German analysis of paths of unintentional introduction and spread of invasive alien species was published in 2018[357]).
- Actions have been carried out to control IAS on the EU and national lists, such as the ruddy duck and the zebra mussel along the Ebro River in Spain, the pond slider in Valencia and Rioja, or the Argentinean parrot in Catalonia. Italian regions have defined and adopted regional blacklists of invasive alien species (primarily plant species) that contain a higher number of species than the Union list.
- The EMFF foresees interventions for the control and eradication of invasive alien species in marine and lagoon areas.
- Notification systems have been set up (e.g. Germany's notification system is linked to an immediate eradication process[358]; in contrast in Bulgaria, a quick response to handling newly detected species is a challenge as there are no clear responsibilities and procedure).
- Successful citizen science projects (such as "MONitoring CSMON-LIFE" and LIFE Asap in Italy) have contributed to IAS containment interventions and awareness raising.

Examples of gaps and challenges:

- Priority species are far from being controlled or eradicated.
- Prevention, detection, eradication, and control strategies have not been completed for a number of species.
- Insufficient actions have been undertaken to limit introductions from legal trade in animals and plants. Failures to define lists of exotic species of national interest and to tackle the continuous search for exotic species for gardening and the spread of commercial cultivations of invasive exotic species have been highlighted by national trade organisations, and research institutions in the case study countries.

[357] Rabitsch, W., Heger, T., Jeschke, J. M., Saul, W.-C. and Nehring, S. (2018) Analyse und Priorisierung der Pfade nicht vorsätzlicher Einbringung und Ausbreitung invasiver gebietsfremder Arten in Deutschland gemäß Verordnung (EU) Nr. 1143/2014], Bonn - Bad Godesberg: Bundesamt für NaturschutzBfN-Skripten 490).
[358] Pers. Comm. interview with BfN.

- The obligation to report the possession of IAS of EU concern has sometimes resulted in their abandonment in the wild by owners who did not understand the reasons for this measure .

Factors influencing success or failure:

- There are insufficient practical tools, expertise on the control and eradication of IAS and communication to citizens on the need to combat IAS (mentioned by authorities and experts in most surveys).
- Some species are problematic but are not included on the Union list. For example, the fight against the Japanese knotweed requires drastic solutions in sectorial regulations (e.g. management of aggregates, soil movement, etc.). The control of exotic animal species is even more complex, including for ethical reasons (inputs from regional and local authorities, NGOs, research organisations).
- Commercial use of some IAS still continues. While in some cases, such as the blue crab Callinectes sapidus (Italy, Spain), commercial fishing catches may contribute to controlling the populations, in general commercial use is seen as incentivising introductions and spread. In the case of competing interests, economic considerations have been prioritised over the Scientific Forum's criteria (interviews with NGOs in Spain, experts in Slovakia).
- Operational difficulties to combat invasive alien species are experienced in marine areas given the nature of the environment, climate change and different forms of pollution (including by ballast waters) (regional authorities in Italy and Spain).

➢ ***In relation to Target 6***

Success examples:

- There has been significant increase in international funding for biodiversity conservation. The target relating to the doubling of financial resources related to biodiversity for developing countries was achieved (Italy[359]) or exceeded (Germany) by some Member States.
- Member States have implemented plans to combat the illegal trafficking of species. In Spain, the competences of the CITES administrative authorities were revised giving NGOs a stronger role. The TECUM project (Tackling Environmental Crimes through standardised approach) in Italy has been strengthened the fight against environmental crimes. Germany has implemented measures against illegal ivory and rhino horn trade, with a total volume of 2,5 million Euro, including activities to reduce the demand in target countries and to prevent poaching in the source countries.
- National Business and Biodiversity Initiatives have involved business in the implementation of the Convention on Biological Diversity[360].
- Under German initiative, the Bonn Challenge[361] was launched in 2011 and mobilised national commitments to restore 150 million ha of degraded forests globally by 2020.

[359] Fourth period (2017-18) Report on the implementation and efficacy of the Strategy (MATMM, 2020).
[360] 6th National report to the CBD – Spain.
[361] Restore our Future Bonn Challenge (2020) The Bonn Challenge.

- Various information and awareness campaigns have been carried out on the conservation of genetic resources and fair distribution of the benefits (Germany, Spain). Different initiatives and projects (ATOPICA, VectorNet in Italy) have explored links between health and biodiversity.
- Memoranda of Understanding have been signed with a number of countries to implement actions to mitigate and adapt to climate change.
- The Italian Government published in 2016 its first catalogue of environmentally friendly subsidies and environmentally harmful subsidies. The German government reviews the sustainability of existing subsidies every two years and tracks environmentally harmful subsidies[362]. Some initiatives to reduce environmentally harmful subsidies, transition to sustainable consumption, and reduce waste have also been highlighted in the Germany case study, such as the 'KonsumWende' - consumption transition project (2017-2019)[363] to develop tools and policy recommendations to promote consumption patterns that lead to the conservation of biodiversity and ecosystem services.

Factors influencing success or failure:

The factors mentioned most often by respondents are:

- Advances and national programmes to address sustainable consumption are expected to have some positive effects in the future if they are backed with human and financial resources. However, these initiatives are in their infancy and there is currently no strategic integrated approach to tackling the key drivers of biodiversity loss (inputs from authorities and NGOs in Germany, Italy, Spain)
- Political will and leadership were mentioned repeatedly by authorities and environment organisations in the case study Member States providing examples of success in regions where there was a strong leadership for biodiversity protection[364] (Spain, Italy, Germany, the Netherlands).
- Stable and predictable national policy and legal frameworks (survey inputs from the Netherlands, Italy and Spain) and a fair playing field (inputs from authorities, civil society organisations in Italy and fisheries sector stakeholders in Italy and Spain).
- A common, integrated strategic approach across policies, plans and strategies. Separation of administrative competences for nature conservation and for the sustainable land and sea management, and insufficient engagement and dialogue between ministries and with stakeholders, users and academia, were mentioned as major implementation weaknesses. (Regional authorities and environmental NGOs in Spain, public authorities in Italy, Germany, Slovakia, Romania, associations of forests, farmers and ranchers, and fishing enterprises in Spain, Lithuania, Slovakia). The EU Biodiversity Strategy was seen by some respondents as a DG Environment undertaking lacking ownership and responsibility in other EU policy areas and sectors such as fisheries and aquaculture, agriculture, forestry management, livestock.
- Coordination between the central authorities and the regional and local levels. Fragmentation across levels of governance and unclear division of responsibilities has been highlighted as implementation challenges by national and regional authorities in Spain, Italy, Germany, the Netherlands.

[362] UBA (2017) Umweltschädliche Subventionen in Deutschland: Aktualisierte Ausgabe 2016, Dessau-Roßlau, Germany: Umweltbundesamt.
[363] Institut für ökologische Wirtschaftsforschung (2019) Konsumwende. Available at: https://www.ioew.de/en/project-single/konsumwende
[364] Interview with NGO.

- Adequate capacities to plan and implement biodiversity measures in the public administration. Cuts in public administration budgets at national, regional and local level in some of the Member States have further diminished environmental implementation and enforcement capacities (Survey inputs in Italy, Lithuania, Romania, Slovakia, the Netherlands).
- Adequate investments from EU funding instruments (in particular LIFE, Horizon 2020, EAFRD, EMFF and Cohesion Policy funds) and national budgets, as well as other financing mechanisms for biodiversity. Biodiversity funding from EU and national instruments and incentives for sustainable management activities have been insufficient for most measures (Survey inputs from respondents across the board). Funding is particularly difficult to obtain for some priority initiatives such as monitoring. At the same time, the case studies have revealed that available funding for nature and biodiversity measures was not always used, or in some cases transferred to other priorities (e.g. in Bulgaria, see section on costs below).
- Mobilising funding to implement large-scale restoration projects has been highlighted as an important factor, since the success of restoration often depends, among other factors, on a sufficient size and strategic ecological connection of the restored areas (evidence from restoration in the Netherlands).
- Some stakeholders considered that there were too limited interventions from the Commission in checking the sustainability of projects approved at national level (inputs from environmental and social NGOs in Italy). Respondents have also pointed to the need for a more effective system to mobilise and track/monitor the use of financial resources for nature conservation coming from different funding programmes (regional and public authorities in a number of Member States, NGOs).
- The impact of the Strategy was weakened by insufficiently measurable and concrete objectives, no obligation for the Member States to implement a minimum number of measures and actions, and deficiencies in data and reporting on progress (including the set of indicators used) (Environmental NGOs in Spain, public authority and research organisation in Italy, stakeholders in Germany).

3. Evidence on spending and cost-effectiveness of biodiversity actions

In general, most national biodiversity strategies and plans were not accompanied by dedicated budgets (e.g. in Spain) and comprehensive evaluations of the mobilisation of resources for biodiversity are not available at the national level. Studies and projects have shown a growing interest in the use of market instruments and public-private financing for biodiversity[365]. There are nevertheless many examples of biodiversity funding.

3.1. Examples of costs of biodiversity measures

- **In Spain** in the period 2008-2017, MITECO financed, through Fundación Biodiversidad, 90 projects on land stewardship to a total value of EUR 4 million[366]. In the period 2009-2012, the Ministry of Agriculture, Food and Environment promoted actions in the Natura 2000 Network in several autonomous communities, for a total amount of about EUR 55 million under the

[365] https://prioridadrednatura2000.es/sites/default/files/instrumentos-innovadores.pdf
[366] Follow up Report of the Strategic Plan for Natural Heritage and Biodiversity (MITECO, 2013).

European Regional Development Fund (ERDF)[367]. Spending for biodiversity, nature protection and green infrastructure under the ERDF (2014-20) was estimated at about EUR 86.32 million in 2021. Projected total annual costs of Natura 2000 management in two desirable short-term scenarios have been estimated at EUR 1,557 million (EUR 114/ha), or EUR 2,602 million (EUR 196.37/ha) with the expansion of marine protected areas. The costs related to the management of Natura 2000 in Formentera (Balearic Islands) amounted to EUR 1,491,500[368] covering measures related to knowledge and research, the recovery of habitats and species to favourable conservation status; damage prevention and/or restoration; sustainable uses and activities; awareness raising and public engagement, and cooperation between competent administrations. In the La Rioja region, species conservation measures carried out by the forestry sector had low costs and high positive returns, while other actions have required major investments, e.g. the conservation of the European mink (inputs from a regional authority).

- **In Italy,** primary expenditure for environmental protection and for the use and management of natural resources amounted to approximately EUR 4.7 billion in 2017 (a decrease from EUR 8.3 billion in 2010). However, expenses for the protection of biodiversity have decreased while the resources for the use and management of flora and fauna have recorded an increase. An important share of the environment expenditure - more than half of the resources - were allocated to the "protection and remediation of the soil, subsoil and surface waters" (30.5%), "other environmental protection activities" (13.2%) and “biodiversity and landscape” (12.2%)[369]. Under the European Regional Development Fund (ERDF) for 2014-20, about EUR 376 million have been spent for investments in biodiversity, nature protection and green infrastructure. Under Rural Development, about EUR 1.9 billion have been allocated for the thematic objective “Preserving and protecting the environment and promoting the efficient use of its natural resources”. The LIFE Nature and Biodiversity sub-programme has financed a total of 26 projects in Italy from 2014 to 2017[370]. Italy’s budget law of 2018 introduced a ‘green bonus’ providing tax deductions for properties that include significant green cover in urban environments[371]. The preliminary estimate of fully implementing the EU Natura 2000 network for the 2014-2020 programming cycle range from EUR 1.8 to 2.5 billion, or annual costs from EUR 267.6 to EUR 424.7 million, of which 46% refers to operating costs and the remaining 54% to one-time costs (e.g. for restoration)[372].
- **In Greece,** the total allocation to actions or sub-measures relevant to Natura 2000 in Greece for the 2014–2020 programming period has been around EUR 860 million, spent through EU (93%) and national (7%) funding from the EAFRD, CF, EMFF, LIFE, and other EU programmes (1%)[373]. Funding for other targets has been quite limited. Ecosystem restoration and GI outside of Natura 2000 areas has been undertaken sparsely across Greece; therefore Target 2 has not generated significant costs or benefits[374]. For the 2014–2020 operational programme, the total EMFF and national contribution to sustainable fisheries in Greece was more than EUR 186 million[375]. Target 5 seems to have only generated some administrative costs

[367] 6th National report to the CBD – Spain.
[368] https://app.alchemer.eu/response/download/file/247-132af265a5a4fd38603ff44900a00d01_20200521_PG_NATURA_2000_FORMENTERA_cast.pdf/id/90260004
[369] Ecorendiconto” published 2019 from the Ministry of Finance is dated concerning the financial year 2018 and reporting data on resource mobilization, expenditures made by Central Administration (Ministries) to biodiversity.
[370] 6th National report to the CBD – Italy (Convention of Biological Diversity, 2019).
[371] Convention on Biological Diversity (CBD) Global biodiversity outlook.
[372] https://chm.cbd.int/database/record/5BF16163-204D-9261-5172-EB83C1DA1226
[373] N2K Group and IEEP (in prep.) Strengthening investments in Natura 2000 and improving synergies with EU funding instruments. Estimates of the aggregated financing costs of Natura 2000 from the Prioritised Action Frameworks 2021-27.
[374] The Green Tank (2020). Προτεραιότητα στη φύση: Αξιολόγηση της υλοποίησης της Εθνικής Στρατηγικής για τη Βιοποικιλότητα.
[375] European Maritime and Fisheries Fund - Operational Programme for Greece (2014 – 2020).

for salaries and studies, but has not yet resulted in a coordinated action. In general, all stakeholders surveyed and interviewed considered that both the EU Biodiversity Strategy as well as the national strategy have not been adequately funded in Greece and that a national funding scheme for biodiversity is missing.

- **In Germany**, the Federal Biodiversity Programme[376,377] was launched in 2011 to finance the **implementation of the National Biodiversity Strategy. Federal funding for large-scale** landscape protection and restoration is available through the chance.natur[378] programme[379]. The Joint Task for the Improvement of Agricultural Structures and Coastal Protection (GAK) is the most important national funding instrument for agriculture and forestry, the development of rural areas and the improvement of coastal and flood protection[380]. Together with funds provided by the Länder, the total GAK budget amounts to around EUR 1.9 billion per year[381]. Added to this is EAFRD funding in the order of nearly EUR 1.2 billion and funding by the Länder and municipalities. The financial requirements for the implementation of Natura 2000 alone in Germany are estimated at approximately EUR 1.4 billion / year, while only approximately EUR 323 million / year was spent on conservation measures via the 2nd pillar of the CAP up until 2013[1]. Between 2014-20 Germany had around EUR 1.35 billion / year in EAFRD funds[382], however on average only 21% were spent on agri-environment-climate measures[383]. The funding needs of the National Biodiversity Strategy for the period 2010-20 were estimated at EUR 3.26 billion / year (excluding marine funding needs)[122] and the financial gap for nature conservation measures has been calculated at EUR 1.96 billion / year. The most cost-intensive conservation measures were estimated for grassland habitats, costing EUR 1.76 billion / year, while annual conservation costs for arable land and forests were calculated at EUR 903.16 million and EUR 354.84 million respectively, for peatlands at EUR 87.96 million, and for dry sites at EUR 89.87 million. Wetland conservation measures were calculated to need EUR 64.68 million / year[122]. The PAF (2013) estimated the total funding needs for implementing the EU nature directives at EUR 627 million / year for the 2014 - 2020 period[384]. This figure was reviewed upwards in 2016 to EUR 1.42 billion / year, excluding the marine environment[98]. The EMFF budget for the period 2014-20 planned around EUR 3-4 million / year for biodiversity needs, mainly for marine Natura 2000 areas, ecologically sound fishing techniques and free flowing rivers. Although this represents 15% of the German total EMFF fund, it covers less than 1% of the Natura 2000 costs.
- **In Lithuania,** the benefits of the Natura 2000 network (comprising the use value of berries and mushrooms, fish and game for amateur fishing and hunting, drinking water quality, visitors and other services) were estimated at about EUR 193 million by the LIFE IP NATURALIT

[376] Bundesamt für Naturschutz. Leben.Natur.Vielfalt (2019) Bundesprogramm Biologische Vielfalt.
[377] BfN and BMU (2016) Bundesprogramm Biologische Vielfalt-Ziele und Fördermöglichkeiten, Bonn: Bundesamt für Naturschutz.
[378] Bundesministerium für Natur, Umwelt und nukleare Sicherheit (2019). Chance.natur Bundesförderung Naturschutz. Available at: https://www.bmu.de/themen/natur-biologische-vielfalt-arten/naturschutz-biologische-vielfalt/foerderprogramme/chancenatur/ [Accessed 15 December 2020]
[379] BMU (2020) *Germany's Sixth National Report to the CBD*, Germany: Bundesministerium für Umwelt. Available at: https://www.cbd.int/doc/nr/nr-06/de-nr-06-en.pdf.
[380] Food and Agriculture Organization oft he United Nations FAOLEX Database (2015) Germany (national level). Available at: http://www.fao.org/faolex/results/details/en/c/LEX-FAOC150344/ [Accessed 15 December 2020]
[381] Federal Ministry of Food and Agriculture (2020) Joint Task for the "Improvement of Agricultural Structures and Coastal Protection" Available at: https://www.bmel.de/EN/topics/rural-regions/rural-development-support/gak.html [Accessed 15 December 2020]
[382] Federal Ministry of Food and Agriculture (2020) Main features of the Common Agricultural Policy (CAP) and its implementation in Germany. Available at: https://www.bmel.de/EN/topics/farming/eu-agricultural-policy-and-support/CAP-main-features-implemantation-germany.html [Accessed 15 December 2020]
[383] Bundesministerium für Ernährung und Landwirtschaft (2020) Umsetzung der ELER-Förderperiode 2014 bis 2020 für ländliche Räume in Deutschland. Available at: https://www.bmel.de/DE/themen/laendliche-regionen/foerderung-des-laendlichen-raumes/eu-foerderung/eler-2014-2020-umsetzung.html [Accessed 15 December 2020]
[384] BfN and BMU (2013) Format für einen Prioritären Aktionsrahmen (PAF) für Natura 2000. Available at: https://www.bfn.de/fileadmin/MDB/documents/themen/natura2000/Prioritaerer_Aktionsrahmen_fuer_Natura_2000_in_Deutschland.pdf [Accessed 15 December 2020]

project[385]. Costs were calculated at just over EUR 10.1 million, and lost income of landowners due to Natura 2000 related restrictions of use at almost EUR 88.7 million. Thus total Natura 2000 benefits were estimated to exceed the costs by about EUR 105 million (2019). However the study scope and methodology were criticised. The National Plan for Landscape and Biological Diversity Conservation estimated the total financing needs for biodiversity for the period 2014-20 at EUR 124.3 million.

- Bulgaria's Operational Programme for the Environment for the period 2014-20 envisaged financing of the amount of EUR 86 million for Natura 2000, of which EUR 15.3 million for the "Conservation and enhancement of biological diversity, nature protection and green infrastructure" and EUR 70.88 million for the "Conservation, restoration and sustainable use of NATURA 2000 sites". The funds actually paid amounted to just over EUR 4.6 million[386]. In 2020, about EUR 35 million were transferred for the economic consequences of Covid-19. The Rural Development Program 2014-20[387] was set to spend almost EUR 140 million on "Payments under NATURA 2000 and the Water Framework Directive" to compensate beneficiaries for additional costs or lost income due to Natura 2000. The actual funds paid amounted to less than EUR 70 million[388].
- In Slovakia, protected areas are mainly financed through the state budget and EU funds. Under the EAFRD for 2014-20, EUR 297.6 million is allocated for nature conservation. Slovakia makes use of financing from the European Regional Development Fund (ERDF) in different ways for nature conservation and GI activities such as cross border cooperation, Interreg for green infrastructure development in cities and regional cooperation projects under the Danube Strategy. Slovakia has also utilised Cohesion Policy funds (2014-20) for nature for the preparation and implementation of management plans for Natura 2000 sites, preparation and implementation of action plans for priority species and habitats, enhancement of the monitoring and reporting, green infrastructure and control of invasive alien species (EUR 41.776 million spent by 2021[389]), as well as LIFE funding (EUR 13.5 million spent by the end of 2020[390]).
- In the Netherlands, no cost estimates have been done for the implementation of the entire biodiversity strategy. An overview of the necessary investments in Natura 2000, species protection outside Natura 2000 and green infrastructure is available for the 2014-20 period from the national Prioritised Action Framework. It includes EU as well as other funding (national postal code lottery) of EUR 322 million, to a total of EUR 4,646.074 million for the entire period, or EUR 663.725 million per year.
  These costs have been found to be an underestimate, and the estimated annual needs for the next period (2021-27) amount to EUR 903.110 million (an increase of 36%).

3.2. Examples of the importance and benefits of biodiversity measures

- **In Spain,** the National Ecosystem Assessment[391] outlined wider benefits from ecosystem conservation for human wellbeing; the socio-economic benefits of the Natura 2000 Network for Spanish society were estimated at EUR 43,661 million per year[392], much higher than the

[385] https://naturalit.lt/wp-content/uploads/2020/10/BGI_VSTT_Natura-2000_Galutine-vertinimo-ataskaita_20200916-su-ekspertu-parasais.pdf

[386] Bulgarian National Audit Office (2019). "Efficiency of the management of Natura 2000 network for protection of the environment and local communities" for the period from 01.01.2016 to 31.12.2018, Sofia
[387] Rural Development Programme 2014-2020. RDP 2014-2020
[388] Bulgarian National Audit Office (2019). "Efficiency of the management of Natura 2000 network for protection of the environment and local communities" for the period from 01.01.2016 to 31.12.2018, Sofia
[389] European Structural and Investment Funds data – Open Data Platform.
[390] EEA, (2020). Management effectiveness in the EU's Natura 2000 network of protected areas. (European Environment Agency 2020).
[391] https://www.miteco.gob.es/es/biodiversidad/temas/conservacion-de-la-biodiversidad/ecosystems_human_well_being_tcm30-196684.pdf
[392] Economic benefits of the Natura 2000 Network in Spain (MITECO, 2019).

costs[393]. The Balearic Islands region benefits from nature tourism and environment productions and films, however failure to halt biodiversity degradation is causing beach surface loss (e.g. in the Es Trenc natural park), alteration of riverside habitats (e.g. in the Torrent de Na Borges) and loss of fisheries due to a decline of the *Posidonia* seagrass meadows. (Survey inputs from a regional authority). Biodiversity measures in agroecosystems have demonstrated direct economic benefits[394] from improved nutrient management and soil organic matter (valued at EUR 150-300/ha), and reduced costs for controlling non-native grasses, pests[395] or diseases[396]. Stakeholders have pointed to a link between agrarian policies that favour large monocultures owned by few service companies and (i) depopulation and loss of quality of life in large rural areas, on the one hand, and (ii) loss of biodiversity and the depletion of natural resources, on the other (Survey inputs from agroecology association, environment NGOs and regional authorities in Spain).

- **In Italy**, large protected areas in different regions has favoured major tourist development creating job opportunities and specialization opportunities for local companies (Regional authority). Direct green jobs at national level in 2011 included over 100,000 people in national parks, more than 1.5 million in regional parks and more than 630,000 people in Natura 2000 sites[397]. A socio-economic evaluation of the benefits from Natura 2000 sites in Trentino (Life + TEN Project[398]) identified benefits linked to the enhancement of natural features, the development of small farms and sustainable tourism, against significant investments in nature protection (Provincial authority and a provincial research entity). Combatting IAS some plants and promoting native vegetation can increases the stability of banks and slopes, reducing the risk of landslides (research and environmental organizations). The assessment of ecosystem services provided by soil indicates potential economic damage due to soil losses exceeding EUR 3 billion per year[399].
- **In Greece**, the benefits of biodiversity measures are multiple but they are not systematically assessed and cannot be monetised. For example, the LIFE TERRACESCAPE project[400] with a budget of around EUR 2.7 million, aims to demonstrate, on the island of Andros, the use of drystone terraces for the revitalisation of island terrace farming to bring benefits for local societies, economies, and biodiversity. In 2020, there were almost 30 thousand organic agricultural producers in Greece[401] and the number of organic farmers increased by 52% between 2015 and 2020. Healthy forests create tourism and recreation opportunities in rural regions in Greece, generating additional income for the local communities[402].
- **In Germany**, identified important services delivered by healthy ecosystems include the reduction of nitrogen loads, avoidance of soil erosion, maintenance of pollination services, the control of pests as well as regulating services e.g. improvement of water and air quality, local climate regulation, protection from extreme weather events, and cultural services e.g. recreation

[393] Analysis of costs for the preservation of the Natura 2000 Network in Spain (MITECO, 2013).
[394] EEA Estación Experimental Agraria de Carcaixent and the IVIA Instituo Valenciano de Investigaciones Agrarias
[395] Sorribas, J., González-Cavero, S., Domínguez-Gento, A. & Vercher, R. 2016. Abundance, movements and biodiversity of flying predatory insects in crop and non-crop agroecosystems. Agronomy for Sustainable Development. 26-34.
[396] González, S., Vercher, R., Domínguez Gento, A., and Mañó, P.; 2008; Biodiversity and distribution of beneficial arthropods within hedgerows of organic Citrus orchards in Valencia (Spain); Control in Citrus Fruit Crops, IOBC/wprs Bulletin Vol. 38, 2008, pp. 275-279
[397] Research on green employment linked to biodiversity (Unioncamere, 2020).
[398] http://www.lifeten.tn.it/binary/pat_lifeten/monitoraggi_monitoring/LifeTEN_D2_Report_Versione_Finale_20180702.1530537807.pdf
[399] State of nature in the EU-Results from reporting under the nature directives 2013-18 and Rapporto ISPRA sul consumo del suolo, dinamiche territorili e servizi ecosistemici edizione 2020.
[400] http://www.lifeterracescape.aegean.gr/
[401] Eurostat (2020). Organic operators by status of the registration process (from 2012 onwards).
[402] Tampakis, S., Andrea, V., Karanikola, P., & Pailas, I. (2019). The growth of mountain tourism in a traditional forest area of Greece. Forests, 10(11), 1022.

and nature experience[403,404]. Floodplains along Germany's largest rivers are reported as delivering purification services (nitrogen, phosphorous) worth 500 million EUR/year, which could be greatly increased through restoration measures. The costs of floodplain restoration of 35,000 ha along the Elbe have been calculated at 566 million EUR. The social benefit arising from flood protection, have been estimated as 177 million EUR, while adding co-benefits from the retention of nutrients, avoidance of old dyke maintenance costs, and the willingness to pay for biodiversity, the total societal benefits were calculated at around 1.75 billion EUR, greatly outweighing the costs of dyke removal and restoration measures. Overall, in the case of large-scale dyke[405]. In the Wurzacher Ried Moors in Southern Germany, it was calculated that restoration measures could save approximately 11,400 t CO_2[406].

- In **the Netherlands**, studies have shown that natural areas provide both the largest diversity of services as well as the largest net value in demanded services while representing a smaller area of the country than agricultural areas and cities[407]. The national natural capital account development resulted in a first attempt by Statistics Netherlands and Wageningen University to calculate the monetary value of 10 terrestrial ecosystem services in line with the SEEA EEA[408]. For example, the flow and asset values (in millions of euros) of several of these services in 2015 is presented in the table below:

		Broad scope estimates of tourism and recreation		*Medium scope estimates of tourism and recreation*		*Limited scope estimates of tourism and recreation*	
Class	Ecosystem service	flow	asset	flow	asset	flow	asset
Provisioning	Crop production	415	13,125	415	13,125	415	13,125
	Fodder/grass production	872	27,569	872	27,569	872	27,569
	Timber production	44	1,381	44	1,381	44	1,381
Regulating	Water filtration	177	7,620	177	7,620	177	7,620
	Carbon sequestration	171	7,391	171	7,391	171	7,391
	Pollination	359	15,470	359	15,470	359	15,470
	Air filtration	86	3,700	86	3,700	86	3,700
Cultural	*Nature recreation*	*3,873*	*122,394*	*2,992*	*94,552*	*2,012*	*63,586*
	Nature tourism	*5,946*	*187,880*	*3,392*	*107,198*	*1,146*	*36,218*
	Amenity services	1,037	32,402	1,037	32,402	1,037	32,402
TOTAL		**12,981**	**418,931**	**9,546**	**310,407**	**6,320**	**208,461**

- **Case studies** in all countries have indicated that failure to achieve the biodiversity targets is linked to negative socio-economic consequences including soil erosion and climate change impacts.

3.3. Examples of adverse socio-economic impacts from implementation

- Sector stakeholders have reported economic difficulties as a consequence from nature protection restrictions and requirements not (sufficiently) backed by social and economic measures to support good practices (NGOs, associations of fishing enterprises, farmers and foresters across the Member States). Farmers are currently faced with conflicts between environmental

[403] Collection of survey answers.
[404] BfN (2015) *Gewässer und Auen- Nutzen für die Gesellschaft*, Bonn: Bundesamt für Naturschutz.
[405] Grossmann, M., Hartje, V. and Meyerhoff, J. (2010) Ökonomische Bewertung naturverträglicher Hochwasservorsorge an der Elbe Naturschutz und Biologische Vielfalt Heft 89).
[406] Leonhardt, S. D., Gallai, N., Garibaldi, L. A., Kuhlmann, M. and Klein, A.-M. (2013) 'Economic gain, stability of pollination and bee diversity decrease from southern to northern Europe', *Basic and Applied Ecology*, 14(6), pp. 461-471.
[407] Government of The Netherlands (2021) Environmental data compendium indicator page 'Ecosystem services in the Netherlands, 2020.
[408] Statistics Netherlands (2021) Ecosystem services.

protection and current economic context and model of farming, seen by many respondents as the result of insufficient governance leadership to facilitate transformative change[409].

- Stakeholders in the fisheries and aquaculture sector in Italy have stated that, if incentives for implementing good practices were available, and if rules were applied across the board (also for international fishing vessels) the socio-economic impacts from measures to conserve fisheries resources and marine ecosystems could be positive. (Business association in Italy).
- The return of some emblematic species has been linked with damage to stock by wolves, or flooding of agricultural land by beaver (farmers associations and regional authorities in Spain, Greece, Italy). However, compensations for damage has reduced tensions between farmers and carnivores for example in Greece.
- Limitations imposed in implementation of the IAS regulation affects private animal holders, zoos (listed species can be kept until natural death but cannot be bred), animal shelters (danger that the regulation will cause shelters to lack placement options), hunters, and gardeners, as well as horticultural and pet trade businesses. Elimination rather than prevention measures can be in conflict with animal welfare[410].

4. Coherence of national policies with the EU Biodiversity Strategy to 2020

4.1. The EU biodiversity targets have been taken into account to different degrees in a range of instruments, including:

- national and regional plans for adaptation to climate change[411], organic agriculture[412], soil protection, forest restoration[413] including of areas affected by fires (e.g. following the Sa Canova fires, Artà; S'Espalmador, Formentera; S'Arenal d'en Castell, Es Mercadal in Spain); river basin management plans, and restoration measures of rivers and ravines, riverside vegetation (e.g. the Alzira green belt in Spain); policy fostering models on Economy of the Common Good[414] and Green Routes[415]; eco-schemes under the CAP for hedges and biodiversity; the protection and sustainable management of forests and dealing with the risk of forest fires; renewable energy in synergy with biodiversity conservation; flood protection through ecosystem restoration and nature based solutions, other infrastructure plans that include ecosystem restoration and nature based solutions (railways, roads, energy etc.), urban green infrastructure[416,417]. (Inputs from regional authorities, agroecology association and NGOs in Spain, Italy).
- The case study in Greece provided examples of cooperation between business and NGOs on the protection, restoration and management of habitats and species (a black pine forest after fires in the Peloponnese, coastal dunes, brown bear protection), as well as dissemination and awareness-raising activities[418]. The Piraeus Bank has provided support to the LIFE-Stymfalia project that restored Stymfalia lake and introduced a long-term plan for its management[419].

[409] Personal Interview NABU and management authority Schleswig-Holstein.
[410] Deutscher Tierschutzbund, Auffangstation für Reptilien, Bmt and Tierärztliche Vereinigung für Tierschutz (2017) Positionspapier zur EU-Verordnung Nr.1143/2014 über die Prävention und das Management der Einbringung und Ausbreitung invasiver gebietsfremder Arten und deren Umsetzung in Deutschland.
[411] https://www.minambiente.it/comunicati/parchi-minambiente-al-maxifondo-ridurre-le-emissioni-di-co2-combattere-i-cambiamenti
[412] http://www.pianetapsr.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/2058
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[416] https://www.isprambiente.gov.it/it/pubblicazioni/rapporti/sinergie-fra-la-direttiva-quadro-sulle-acque-e-ledirettive
[417] https://welforum.it/la-legge-di-bilancio-2020-e-gli-obiettivi-di-sviluppo-sostenibile/
[418] OECD (2020). OECD Environmental Performance Reviews: Greece 2020.
[419] http://www.lifestymfalia.gr/

4.1. Examples have also been provided of incoherence with the EU biodiversity targets to 2020, such as:

- National Programming and spending under EU funding instruments such as the EAFRD, EMFF and Cohesion Policy funds include measures that can provide major contribution to biodiversity, depending on the implementation choices made in the Member States. However, at the operational level in the Member States, for example some CAP direct payments have encouraged intensification, the removal of borders with wild species, mechanization, water management modifications and the use of plant protection products and fertilisers; incentives for intensive forest plantations such as eucalyptus; and for the use of water resources, including irrigation (Spanish agroecology association and environment NGOs, national and regional authorities in Italy).
- Support for certain transport, energy (including renewable energy), hydrological and other infrastructures may have significant negative impacts on biodiversity. Infrastructure plans have not taken biodiversity impacts into account to a sufficient degree. (Agroecology association and a farms and ranchers association in Spain, regional authorities and research institute in Italy, regional authorities, research institutes and NGOs in Greece, NGOs and research organisations in Germany). The case study in Lithuania provided examples of perceived conflicts between biodiversity and climate mitigation and adaptation objectives in relation to (old-growth) forests.
- The EU Biodiversity Strategy to 2020 has been seen as relatively weak in terms of ensuring coherence with EU sectoral policies, especially the critical natural resource use policies such as on farming, forestry and fishing. In addition to slow progress to targets 3 and 4, this has had important knock-on effects on achieving targets 1 and 2 (case study in the Netherlands).

5. Relevance of the EU biodiversity targets to biodiversity needs in the Member States

- Overall, respondents across the Member States considered the Strategy relevant to biodiversity needs. However, biodiversity needs themselves have often remained low in the ranking of priorities for policy and investment decisions (research entities, regional authorities, NGOs across the survey Member States).
- Some respondents considered that the EU biodiversity targets had been too vaguely formulated and insufficiently concrete, for example in relation to pesticide reduction or organic farming. (Environmental NGOs in Spain) or pressures from urban development, construction and tourism (agriculture stakeholders in Greece, Spain, Italy).
- While biodiversity needs have remained similar, the intensity of threats and pressures on habitats and species has evolved since 2011. Marine, coastal, terrestrial and freshwater ecosystems all show vulnerability to climate change, constituting a growing emergency. Another major emergency is linked to soil degradation and loss and desertification (regional authorities, research organisations and environmental NGOs in Spain, Italy).
- Areas considered in need of stronger emphasis include: adapting to the impacts of climate change on ecosystems and species, the promotion of good practices (in farming, forestry, sustainable fishing), more focus on vulnerable ecosystems (e.g. coastal, freshwater) and on ensuring that the development of fast growing sectors such as renewable energy is done in ways that minimise pressures on biodiversity; more attention to traditional management systems, improvement of biodiversity governance at all levels, education and youth involvement, fair distribution of the costs and benefits of biodiversity conservation and green taxation (survey

inputs from forest association, agroecology association, and farmers and ranchers association in Spain, regional authorities in Italy, environmental NGOs in Bulgaria).

6. EU added value of the EU Biodiversity Strategy to 2020

- Respondents have overall recognised the added value of the Strategy, compared to what would have been achieved by national efforts in its absence. A number of Member States had no biodiversity-related strategy nor targets in place prior to the EU Strategy, and biodiversity knowledge was insufficient. The Strategy is seen to have raised the ambition of national biodiversity objectives, helped to set deadlines for their achievement, as well as to attract funding for biodiversity from EU instruments, and to generate investments in large biodiversity projects. It has also encouraged a more coherent approach and cross-border cooperation on biodiversity in the EU (environmental NGOs, association of farmers and ranchers, regional authorities, association of fishing enterprises in Spain, regional authorities and environmental consultancy in Italy, Bulgaria).
- The added value of the EU Strategy was seen as lower by respondents in the context of Germany which already had a comprehensive biodiversity strategy in place. But it was recognised that the Strategy was useful to keep the topic on the national agenda and to push for delivery. The Dutch case study questioned the added value of Target 1 in comparison to what would have happened in implementation of the Nature Directives without the (voluntary) target.
- The Strategy is also seen as adding value in integrating biodiversity objectives in different sectors. A number of case studies provide evidence of changes in key sectoral policies due to the EU biodiversity targets to 2020. However, biodiversity conservation is still considered as a separate policy area (regional authorities, environmental NGOs, sector forest associations).
- The added value of the Strategy has been further reduced by its ambiguity on some targets and by governance weaknesses, in particular gaps in defining the responsibilities for implementation. The non-binding nature of the targets made it difficult to ensure compliance (in particular in relation to restoration). No clear funding was earmarked for implementation (environmental authorities, research organisations, NGOs in Spain, Italy, Greece, Germany, Lithuania, Bulgaria).
- Some stakeholders considered that the Strategy did not provide for sound implementation instruments, and that better results would have been achieved in the agricultural, forestry and aquaculture sectors by providing more dedicated funding from EU instruments to compensate and incentivise biodiversity measures (Associations of farmers, association of fishing enterprises, forestry in Spain, Italy); or by setting the biodiversity targets and measures directly in other policy instruments (regional authorities in Italy).