

THE EU BIODIVERSITY STRATEGY

Progress report 2011 - 2018



Contents

Executive summary 3

Introduction..... 4

Methodology 6

Results 9

Target 1..... 10

Target 2..... 14

Target 3A Agriculture 15

Target 3B Forestry 18

Target 4..... 20

Target 5..... 24

Target 6..... 25

Lessons learned 28

Conclusions and recommendations 30

Acknowledgements 32

References..... 32

Author: Wouter Langhout
Langhout Ecologisch Advies
Rotterdam, 22 May 2019
© Langhout Ecologisch Advies, 2019



All content and opinions expressed in this report are solely those of Langhout Ecologisch Advies.
This report has been commissioned by Stichting BirdLife Europe and Central Asia with support from the European Commission.

Executive summary

The EU Biodiversity Strategy to 2020, adopted in 2011, provides a framework of action for halting biodiversity loss and the degradation of ecosystems and sets out the contribution of the EU to halting global biodiversity loss. To achieve this, the Strategy has six targets covering EU nature legislation, ecosystems and their services, agriculture and forestry, the marine environment, invasive alien species and global biodiversity loss. The targets are accompanied by detailed actions for the European Commission and the EU Member States.

This report evaluates the progress in achieving the targets and implementing the actions until the end of 2018. The report is based on a quick scan of scientific and other literature and provides an update to the mid-term assessments in 2015.

At the end of 2018, the implementation of the Strategy was for the most part a failure. There has been little progress in four targets, and the situation of biodiversity in agricultural and forest ecosystems had worsened since 2010. The majority of actions also saw little progress or outright failure. In particular the implementation of actions that required new legislation, financing and implementation or enforcement of existing legislation was poor, suggesting a lack of high-level political commitment.

Substantial progress was made in only a few areas. The adoption of the Regulation on Invasive Alien Species was a major step forward. Other important achievements are the increasing EU contribution to financing action on biodiversity worldwide and the expansion of the Natura 2000 network, in particular in the marine environment.

There is plenty of room for action until 2020, in particular for action by the Commission. The report identifies the following priorities for action:

- 1) The Commission should progress existing infringement procedures on the management and protection of the Natura 2000 network.
- 2) The Commission should restart the work on restoring degraded ecosystems, by strengthening the linkages to climate change mitigation and restoration.
- 3) The Member States should roll out emergency agri-environmental measures for species with Species Action Plans.
- 4) The Commission should take emergency measures to put overfished populations on track to Maximum Sustainable Yield, and to eliminate incidental catches for priority seabirds and marine mammals.
- 5) The Commission should start the process to add all priority species to the EU list of invasive Alien Species.
- 6) The Commission and the EU Member State should start the work on an inventory of environmentally harmful subsidies in the EU.
- 7) The Commission should identify priority commodities to address in terms of the effects of EU consumption patterns on biodiversity inside and outside the EU.

In addition the Commission needs to improve the tracking of financing for biodiversity and financing for Natura 2000 in its yearly budget.

Introduction

Staying within the safe planetary boundaries is one of the major challenges for humanity in the 21st century. The planetary boundary for biodiversity has already been crossed, with extinction rates estimated to be at least hundred times higher than in preindustrial times (1). The values of biodiversity and ecosystems to humanity are many and irreplaceable, and we have a moral imperative to share our planet with other living creatures.

The EU Member States and the EU institutions together have the power needed to make a difference in saving biodiversity on this planet. Recognising the importance of a high level of environmental protection, the Member States have given the EU a shared competence on environment to under the Treaty, allowing it to legislate and adopt legally binding acts (2). The EU competence on the environment is very wide, including for example criminal law (3) and forestry (4). It should be highlighted here that although the EU has been very important in protecting the environment, shared competence implies that the Member States as sovereign states also can and should act on their own. EU action has often been inspired by environmentally leading Member States (5), which is a great dynamic for fostering political agreement and sound legislation.

The current EU Biodiversity Strategy to 2020 was adopted in 2011 and provides a framework for action of the EU for halting biodiversity loss. The Strategy consists of a headline target for 2020, a 2050 vision and six targets (see Table 1). Under the targets are 37 actions which outline concrete regulatory proposals involving new legislation and financing, the implementation of existing EU legislation, enforcement by the Member States and the European Commission and other policy initiatives such as knowledge, policy strategies and communication platforms. The EU Biodiversity Strategy is the implementation of the Convention on Biological Diversity by the EU (6). It is of particular relevance for the implementation of Aichi targets, covering all of them in considerable detail (7).

An evaluation at the end of 2018 is timely. Although final conclusions on the success of the Strategy are only possible after 2020, in 2018 most actions should have been completed or at least have seen substantial progress. With only a short time period left with the elections of the European Parliament and the subsequent installation of a new Commission in 2019 for new EU action is limited. In addition, many of the deadlines in the Strategy have been long past. It can therefore be reasonably assumed that for many actions and targets the current status is close to the final result.

The Commission and the Member States are expected to continue the implementation of the Strategy until the end of 2020. The adoption of new legislation is unlikely due to the changes in the EU institutions mentioned above, but some other actions can realistically still be completed. The report therefore provides recommendations for action until 2020, focussing on quick wins and actions that add value under the current and the next Biodiversity Strategy.

Finally, the present report focusses on the current Biodiversity Strategy to 2020. It should be highlighted here that this alone will not be sufficient to prepare the ground for the next Biodiversity Strategy. A radical reorientation of EU biodiversity policy will be needed to reflect updated information on the state of nature in the EU, the pressures on biodiversity inside the EU, the effects of EU consumption patterns on global biodiversity and socio-economic drivers behind biodiversity loss, and the effects of climate change. This will be the subject of a separate report, expected before the end of 2019.

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.
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.
Target 1	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
Target 2	By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems.
Target 3	A) 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. B) 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 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.
Target 4	Fisheries: 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.
Target 5	By 2020, Invasive Alien Species 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.
Target 6	By 2020, the EU has stepped up its contribution to averting global biodiversity loss.

Table 1: Overview of the Biodiversity Strategy. * For target 3A and 3B, 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.

Methodology

The present analysis covers the progress under the Biodiversity Strategy headline target, the six other targets and the 37 actions and sub-actions. The analysis is a desk-based quick scan of the relevant scientific and grey literature. It builds to a large degree on the Mid-term Review by the European Commission in 2015 (8), and its accompanying Staff Working Documents (9), as well as previous assessments by BirdLife Europe and Central Asia in 2015 (10) and 2012 (11) and a recent major study on the implementation of the EU nature legislation (12).

In 2016 the Commission completed the Fitness Check on the Birds and Habitats Directives (13), which resulted in the adoption of an Action Plan for Nature, People and the Economy (14). However, given the timeline of implementing the actions under the Action Plan an evaluation of actions is not included in the present analysis. Another initiative that is not included in the present analysis is the EU Pollinators Initiative (15), also because of its timeline.

The targets and actions of the Biodiversity Strategy are in general qualitative rather than quantitative, and in many cases multiple interpretations of the wording are possible. The present analysis assesses the progress towards achieving the targets and the action therefore on a relatively simple scale, classifying targets and actions as 1) Completed; 2) Substantial progress; 3) Little progress; 4) Failure or 5) Moving backwards. Completed means that the action has been fully completed or the target fully achieved. Substantial progress means that it is on track to completion or achievement before 2020. Little progress means that the implementation of the action or target is delayed or only partially done, and full implementation before 2020 is unlikely. Failure means that that action or target cannot be completed before 2020 anymore. Moving backwards means that achieving the target or completing the action has become less likely since 2010.

The assessment of the 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 – is based on a combination of the achievement of the six other targets and biodiversity loss in the strict sense. For the latter, the assessment also includes a summary of IUCN Red List assessments to analyse extinction risk and to assess whether species had gone extinct since 2010 in the EU (excluding Croatia), in the North East Atlantic and the Mediterranean and Black Sea regions, as well as possible extinctions. The IUCN Red List assessment at EU level for the following groups were included: amphibians, bees, birds, butterflies, dragonflies, grasshoppers, crickets and bushcrickets, molluscs (terrestrial and marine), lycopods and ferns, mammals, reptiles, saproxylic beetles and vascular plants. For the last group only the assessment of the protected plant species under the Habitats Directive, Bern Convention and EU Wildlife Trade Regulation was included.

The analysis of several actions also required the processing of data. For action 1A the major deficiencies from the Commission CIRCABC platform (16) at the end of 2018 were used. A major deficiency means that there have been no Natura 2000 sites designated for a species or habitat type yet in the country and biogeographic region concerned. The analysis only covers major deficiencies, but it should be noted that full completion of the Natura 2000 network logically means addressing all deficiencies, including minor and moderate deficiencies. For action 2 the figures from a study analysing biodiversity tracking (17) were extracted. The assessment uses the most conservative estimates for biodiversity spending under Direct Payments, in particular lowest estimate of the cost of compliance with the greening requirements and the lowest share of land associated with

compliance in the study. For Rural Development a general reduction of 60% was applied based on the estimate on the study of resulting biodiversity spending under a more restrictive application of the Rio markers.

The assessment of Action 3C includes all Letters of Formal Notice from the Commission's infringement database with the heading 'Nature', which were classified as relating to 1) species protection, 2) plans, projects and deterioration of sites, and 3) designation and transposition. For action 5 substantial progress at Member State level means that an assessment of ecosystem services had been completed or had been funded. Action 18A is based on an analysis of the reports under the Financing Reporting Framework of the CBD Clearing House Mechanism (18), converted into Euro using the exchange rate at the end of 2010 for the baseline and at the end of the year for the years 2011-2015 (19).

Following the assessment of progress under the actions of the Strategy, actions requiring new legislation, the implementation of existing EU legislation and enforcement by the Commission and Member States were separated from the actions that involved other policy initiatives (for example studies, assessments, reporting or communication platforms).

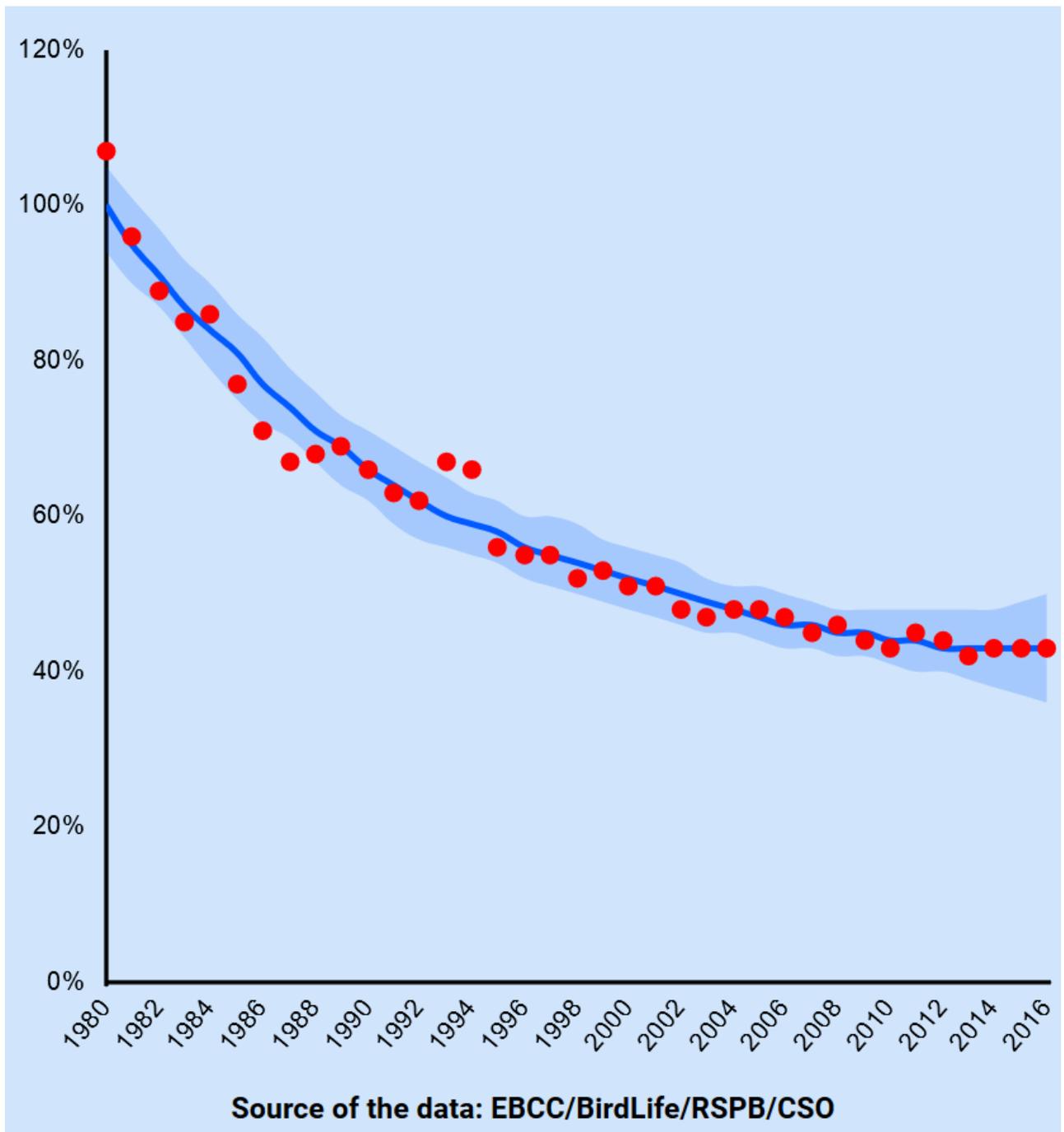


Figure 1: The EU Farmland Bird Index between 1980 and 2015.

Results

Table 3 presents the detailed assessment of all actions in the Biodiversity Strategy. An overview of the actions is given in Table 2. By the end of 2018 there has been substantial progress towards only one target, Target 5 on invasive alien species. The situation for species and habitat types linked to grassland, crop and forest ecosystems is considerably worse compared to the 2010 baseline, and achievement of Target 3 is moving backwards. There has been little progress on the other targets.

Eight actions had been completed, and there has been substantial progress in implementing seven actions. There had been little progress on another ten actions, and eight actions had failed and will not be implemented before 2020. Four actions were not assessed due to a lack of evidence or clarity, and for two actions (action 3B and 3C) there was no consolidated information on the implementation of the Member States.

	Legislative, implementation or enforcement actions completed or with substantial progress	Other policy initiatives completed or with substantial progress	Total
Commission	5/16	10/16	15/32
Member States	4/13	2/6	6/19
Total	5/17	10/16	15/33

Table 2 Overview of progress under actions in relation whether they required new legislation, financing, implementation or enforcement of existing legislation or other policy initiatives (studies, communication platforms, etc.).

Table 3: Overview of progress under the actions of the EU Biodiversity Strategy to 2020

Target or Action	Synopsis of evidence	Assessment
<p>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</p>	<p>Overall there has been little progress on Target 1, 2, 4 and 6. The situation under Target 3 has deteriorated compared to the baseline. There only been substantial progress on Target 5.</p> <p>The loss of biodiversity has not been halted. Although no species that were known to be present in the EU in 2000 had been declared extinct by the end of 2018 according to the global IUCN Red List assessments, at least 299 species are Critically endangered at EU level, with at least 39 species possibly extinct (20).</p> <p>The condition of ecosystems has not been assessed yet. The EU has increased its funding for biodiversity outside the EU but has made little progress in eliminating harmful subsidies and reducing the impacts of its consumption on biodiversity worldwide.</p>	<p>Little Progress</p>
<p>Target 1 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</p>	<p>The latest assessment of conservation status (21) showed that in 2007-2013 compared to the baseline 8,5 % of the protected bird species had an improved conservation status. Around 52 % of the birds species was in a secure conservation status, while the target is 78 %.</p> <p>Compared to the baseline, 4 % of species protected under the Habitats Directive had an improved conservation status and 23 %</p>	<p>Little progress</p>

<p>status; and (ii) 50% more species assessments under the Birds Directive show a secure or improved status.</p>	<p>was in a favourable conservation status, while the target is 34.5 %, taking into account improvements in knowledge on conservation status. Out of the habitat types had 4.4 % an improved conservation status and 16.4 % was in a favourable conservation status, with the target being 34 %. The assessment also showed that 16 % of the bird species have declining long- and short-term trends and 22 % of the other species and 30 % of the habitat types are in unfavourable conservation status and deteriorating. Notably, the number of habitat types in favourable conservation status decreased.</p>	
<p>Action 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.</p>	<p>According to the official methodology for assessing completeness of the Natura 2000 network under the Habitats Directive (16), there are only 66 major deficiencies left in the network in the latest assessments, mainly in Germany, Portugal and Greece. In view of the large number of Natura 2000 sites under the Habitats Directive (22 979 by the end of 2017) it is very likely that the network for the Habitats Directive is largely complete. Recent reviews show that 66 % of the terrestrial Important Bird Areas (IBAs) are protected as Special Protection Areas under the Birds Directive (22) and 46 % of the marine IBAs (23), with significant extensions during recent years compared to the 2010 baseline (24).</p>	<p>Substantial progress Implementation</p>
<p>Action 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</p>	<p>The Common Agricultural Policy has not improved in terms of integrating species and habitats protection and management requirements (see Target 3). The second cycle of River Basin Management Plans under the Water Framework Directive does not integrate the requirements of protected areas any better than the first cycle, with only very few specific objectives identified by Member States (25).</p>	<p>Failure Legislative, implementation</p>

<p>Action 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</p>	<p>Only 69 % of the relevant Sites of Common Interest that have been designated in 2011 had been designated as SAC by 2017, according to the Standard Data Forms (26). Only 23 % of the SPAs have management plans or equivalent instrument, and only 46 % of the SCIs.</p>	<p>Little progress Implementation</p>
<p>Action 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</p>	<p>Biogeographic seminars have been held for all biogeographic regions under the Habitats Directive (27).</p>	<p>Completed Other policy initiative</p>
<p>Action 2 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</p>	<p>There are no accurate data available to estimate funding needs for Natura 2000 but there was a strong consensus among Member States and stakeholders in 2015 that current funding was insufficient (28). Further information on the needs will be collected as part of the Prioritised Action Frameworks (29). It is however unlikely that any major funding for Natura 2000 is forthcoming before 2020.</p> <p>According to a study providing detailed biodiversity tracking of the EU budget (17), biodiversity spending under the LIFE fund, the only dedicated funding source, has increased slightly to 248 million in 2017 (draft budget), from 221 million in 2015, but the other funds are forecasted to show a decrease to 4648 million EUR in 2017 (draft budget) from 5047 million in 2015. Note that a conservative estimate is used here for Direct Payments and Rural development, as a review of effectiveness of measures under the CAP (30) provides grounds for caution.</p>	<p>Failure Legislative, financing</p>

	The Commission provided its views on financing Natura 2000 in 2011 (31).	
Action 3A The Commission, together with Member States, will develop and launch a major communication campaign on Natura 2000 by 2013.	Several major communication tools have been developed, notably the Natura 2000 award (32) and the Natura 2000 day (33).	Completed Other policy initiative
Action 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	Guidance documents on the protection and management of Natura 2000 sites are available for almost all key sectors (34), with the possible exception of outdoor recreation and tourism. There are not yet any guidance documents on the integration of species protection requirements into key sectors, with the exception of hunting and to some extent aquaculture (cormorants) and agriculture (large carnivores) (35). There is no consolidated information available on guidance documents at national level.	Substantial progress Implementation
Action 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.	Specific training programmes have been organised for judges (36). There has been no training for prosecutors, although the Commission has funded out a capacity-building project (37). Arguably the most important policy instrument for better compliance promotion capacities at national level, the proposal for an EU Directive implementing the Aarhus convention, has been withdrawn and has been replaced by a non-legally binding notice (38). As the Natura 2000 network is approaching completion (see Action 1A), the Commission was expected to focus its attention on ensuring compliance with the legal requirements on the protection and management of the network. Although the Commission has	Little progress Enforcement

	<p>sent several Letters of Formal Notice on the designation of SACs (see Action 1C) in 2018 and 2019, there has been a marked decrease in Letters of Formal Notice related to plans and projects and deterioration of sites since 2010 (39). There is no consolidated information available on enforcement at national level.</p>	
<p>Action 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.</p>	<p>A new reporting system has been developed, and the data can be easily accessed online and downloaded in several formats (40).</p>	<p>Completed Other policy initiative</p>
<p>Action 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.</p>	<p>The Biodiversity Information System for Europe is available online, contains all major data sources and information on relevant policies, and is regularly updated (41).</p>	<p>Completed Other policy initiative</p>
<p>Target 2 By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15 % of degraded ecosystems.</p>	<p>The restoration of degraded ecosystems has failed (see Action 6A). A Green Infrastructure Strategy has been developed (see Action 6B) and the knowledge on ecosystems and their services has improved, but implementation has been too slow.</p>	<p>Failure</p>
<p>Action 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</p>	<p>There was substantial progress on mapping and assessing ecosystem services at national level in 24 Member States by the end of 2018 (42). A map of ecosystems has been developed and the available indicators and data have been reviewed (43). The fifth MAES report contains a set of proposed indicators for ecosystem condition (44).</p>	<p>Substantial progress Other policy initiative</p>

<p>Action 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.</p>	<p>At the end of 2018 only two Member States had developed a strategic framework to set priorities for ecosystem restoration according to the latest information available on the Commission website (45). No official methodology for strategic frameworks has been developed following the completion of a study on this topic (46).</p>	<p>Failure Other policy initiative</p>
<p>Action 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.</p>	<p>The Commission adopted A Green Infrastructure Strategy in 2013 (47) and developed guidance on how to use Cohesion funds for Green Infrastructure (48). The Natural Capital Financing Facility has funded only a limited number of projects by the end of 2018, with only one investment in urban Green Infrastructure in Athens, and one rural and one urban project are being considered (49).</p>	<p>Little progress Other policy initiative</p>
<p>Action 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.</p>	<p>The Commission has developed guidance on biodiversity proofing for all relevant EU funds (50). It is not yet possible to assess to which extent this guidance has been applied during the programming and EU funds.</p>	<p>Completed Other policy initiative</p>
<p>Action 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).</p>	<p>The No Net Loss initiative is at the stage of impact assessment, after the public consultation revealed diverging opinions on the policy instruments for the initiative (51). As there is no further information on the initiative, this action is not assessed.</p>	<p>Not assessed</p>
<p>Target 3A Agriculture By 2020, maximise areas under agriculture across grasslands, arable land and permanent crops that are covered by</p>	<p>The latest assessment of conservation status (21) revealed that 28 % of the bird species dependent on agricultural ecosystems are declining on the long- and the short-term. The Farmland Bird</p>	<p>Moving backwards</p>

<p>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.</p>	<p>Index shows a major decline between 1980 and 2015. Over the last ten years the trend became statistically stable but remained negative (Gregory et al. 2019). There is no sign of recovery.</p> <p>Compared to the baseline the conservation status of 22 % of the other species dependent on agriculture and 39 % of the habitat types has deteriorated. Only 8 % of the bird species, 4 % of the other species and 4 % of the habitat types are improving.</p> <p>The Ecological Focus Areas (EFAs) under the CAP include several options that are unlikely to bring significant benefits to biodiversity, and as a result in 2016, only 23-25 % of EFAs were allocated under options with a significant potential benefit to biodiversity (52). Under the 118 Rural Development Programmes for 2014-2020, the area of cover by biodiversity-related measures is 17.4 % of EU utilised agricultural area (53). This is very likely a significant decline from the Programmes for 2007-2013 which reportedly covered more than 42.7 million hectares (54), more than 24 % of EU utilised agricultural area in 2010.</p>	
<p>Action 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).</p>	<p>The 2011 proposal for the CAP 2013-2020 (55) included the delivery of environmental public goods as greening of direct payments. However the European Court of Auditors concluded that the fixed budget for greening was in essence an income support measure, the proposal lacked a clear intervention logic in terms of environmental public goods and had no concrete objectives for them, and included major weaknesses such as replacing crop rotation by crop diversification (56). The Court of Auditors found that the proposal was then further weakened by the European Parliament and the Council.</p> <p>The 2018 proposal for the CAP 2021-2027 (57) includes the delivery of environmental public goods as part of conditionality,</p>	<p>Failure Legislative</p>

	<p>which would be determined under the Strategic Plans to be developed by the Member States. The Court of Auditors highlighted (58) in their opinion on the proposal that it is unclear how the Commission would check the Strategic plans, and that sanctions for not meeting the greening requirements are lower than the 2013-2020 CAP.</p>	
<p>Action 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.</p>	<p>The 2011 proposal for the GAEC under the CAP 2013-2020 (59) included a provision for the Water Framework Directive and the Sustainable Use of Pesticides Directive, but these have been removed during the legislative process (60). In the 2011 proposal the protection of bird and plant species had already been removed from cross-compliance (61). The 2018 proposal (62) notably mentions the Water Framework Directive in cross-compliance, but removes several restrictions on irrigation expansion. Importantly, as mentioned before the Court of Auditors highlighted (63) in their opinion that the unclear how the Commission would check the Strategic plans and that there are significant weaknesses in assessing regularity and legality due to the changing roles of the certification bodies (64).</p>	<p>Little progress Legislative</p>
<p>Action 9A The Commission and Member States will integrate quantified biodiversity targets into Rural Development strategies and programmes, tailoring action to regional and local needs.</p>	<p>The Implementing Regulation on Rural Development (65) does not contain an obligation to set quantified biodiversity targets for Rural Development Programmes relating to species, habitat types, ecosystem types or high nature value farmland, only a broad indirect target indicator on the percentage of agricultural land under management contracts supporting biodiversity and/or landscapes.</p>	<p>Failure Legislative, implementation</p>

<p>Action 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.</p>	<p>The Rural Development Regulation prioritises the cooperation of farmers and foresters on landscape, biodiversity and provides the possibility to cooperate for genetic resources (66), but most agri-environment-climate measures are still implemented at farm level (30). The Regulation on Direct Payments also offers the possibility for collective implementation of Ecological Focus Areas (67), however collective EFAs have been implemented to a very limited extent (30).</p>	<p>Little Progress Other policy initiative</p>
<p>Action 10 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.</p>	<p>Genetic diversity has received 266 million EUR under the Rural Development Programmes, and there have been several other initiatives and amendments to legislation (68). A project on genetic diversity has been completed in 2017 (69). Currently no formal roadmap or impact assessment exist out for a future strategy (70), and there is no recent information on trends in genetic diversity (71).</p>	<p>Little Progress Other policy initiative</p>
<p>Target 3B 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.</p>	<p>The latest assessment of conservation status (21) revealed that 13 % of the bird species dependent on forest ecosystems are declining on the long- and the short-term. Compared to the baseline the conservation status of 17 % of the other species dependent on forest and 28 % of the habitat types has deteriorated. Only 7 % of the bird species, 6 % of the other species and 3 % of the habitat types are improving.</p> <p>The Regulation on Rural Development requires Member States (72) to specify a threshold above which forest management plan or equivalent instrument are required to be eligible for funding. The evaluation of the Rural Development Programmes showed that the threshold varied widely, from requiring plans for all</p>	<p>Moving backwards</p>

<p>*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.</p> <p>** 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.</p>	<p>forests to only requiring plans for forests above 100 hectares (73). Further forestry management plans are being developed as a review of 100 Rural Development Programmes for 2013-2020 found that 31 included Forest Management Plans (74).</p>	
<p>Action 11A</p> <p>Member States and the Commission will encourage the adoption of Management Plans, inter alia through use of rural development measures and the LIFE+ programme.</p>	<p>A review of 100 Rural Development Programmes for 2013-2020 found that 31 included Forest Management Plans (75). There were at least 24 forest management plans funded by LIFE Projects (76). It is not yet possible to assess to what extent the Forest Management Plans have led to improvements in conservation status.</p> <p>It should be noted that the Forest Management Plans are very different in different Member States. A survey in 2013 on Forest Management Plans (77) showed that the nature and legal status of the plans are very different across the EU. In some Member States such as Austria, Ireland and Sweden the plans had no legal status at all, and in the United Kingdom they are based on a voluntary standard. Similarly, monitoring of forests and tracking of implementation were also very different between Member States.</p>	<p>Not assessed</p>
<p>Action 11B</p> <p>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.</p>	<p>The Natural Capital Financing Facility (78) has financed the Irish Sustainable Forest Fund, which aims at improving several ecosystem services, in particular regulating services related to water, soil and carbon. Several Member States have financed Payments for Ecosystem Services related to forests (79).</p>	<p>Substantial progress</p> <p>Other policy initiative</p>

<p>Action 12 Member States will ensure that forest management plans or equivalent instruments include as many of the following measures as possible:</p> <ul style="list-style-type: none"> - 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 - 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, in particular as regards the diversity of species, and climate change adaptation needs. 	<p>A survey in 2013 of Forest Management Plans showed that some Member States included the measures referred to in Action 12 (80). Deadwood is for example included in Belgium (Wallonia), Germany, Greece and Luxembourg. Natura 2000 was included in several Member States. Italy and Belgium (Wallonia) included the SFM33 Guidelines. There is no recent information on Forest Management Plans to assess any possible changes since 2013.</p>	<p>Not assessed</p>
<p>Target 4 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.</p>	<p>The monitoring of the CFP in the North-East Atlantic, Baltic, Mediterranean and Black Seas in 2017 (81) indicated that out of the 117 stocks assessed for FMSY, overfishing (F exceeding FMSY) was occurring in 60 stocks. Overfishing was happening in the majority of stocks in the Baltic (seven out of eight stocks assessed), Mediterranean (35 out of 40 stocks) and the Black Sea (six out of seven stocks). There has been a reduction in fishing pressure in the North-East Atlantic regions but not in the Mediterranean or Black Sea.</p>	<p>Little Progress</p>

	<p>Information on BMSY is scarce, with only 25 out of 117 stocks assessed for FMSY also having been assessed for BMSY. Only 16 stocks were known to have achieved FMSY and BMSY in 2017. The CFP monitoring report concluded that it is unlikely that MSY will be achieved by 2020 although the overall trend is a growing number of stocks being fished in line with FMSY.</p> <p>The methodology and criteria for assessing Good Environmental Status under the Marine Strategy Framework Directive have been revised in 2017 (82) and therefore no assessment of Good Environmental Status is available. Nevertheless, in the last assessment on the implementation of Member States programmes of measures, the report states “Achieving good environmental status by 2020 across all European marine regions and for all the 11 descriptors of the Directive remains unlikely” (93).</p>	
<p>Action 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.</p>	<p>For a discussion on achieving MSY in the European seas see Target 4. A scientific review showed that in out of 27 stocks covered by Sustainable Fisheries Partnership Agreements, FMSY is likely exceeded in six Tuna stocks and BMSY in 12, as well as in many stocks in the mixed fisheries (83).</p>	<p>Little Progress</p> <p>Legislative, implementation</p>
<p>Action 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.</p>	<p>The Baltic Multi-Annual Plan allowed fish stocks to be exploited above MSY, using a range of FMSY which allows fishing mortality to exceed FMSY (84). The North Sea Plan was adopted with the same exception (85). The Commission has proposed Multi-Annual Plans for the Adriatic and also for demersal fisheries in, respectively, Western Mediterranean and Western Waters that also allow for overexploitation of fish stocks (81).</p>	<p>Failure</p> <p>Legislative, implementation</p>

<p>Action 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.</p>	<p>An assessment of all stocks in the North-East Atlantic, Baltic, Mediterranean and Black Seas in 2016 (81) showed that the number of stocks assessed have remained stable, as the addition of new assessments has been offset by a decrease due to stricter data requirements. No scientific advice has been provided on incorporating ecological considerations in MSY (86).</p>	<p>Little Progress Other policy initiative</p>
<p>Action 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.</p>	<p>The CFP Regulation (87) introduced a gradual landing obligation for all species subject to catch limits, aiming at reducing the bycatch of unwanted commercial species. By 2019 all species subject to TAC limits and Minimum Conservation Reference Sizes in the Mediterranean should have been subject to the landing obligation.</p> <p>Temporary discard plans were established for 2015 – 2019 which detail the species covered, provisions on catch documentation, minimum conservation reference sizes, and exemptions (for fish that may survive after returning them to the sea, and a specific de minimis discard allowance under certain conditions). By 2019, multiannual plans should have replaced the temporary discard plans. However, the few Multi Annual Plans adopted so far (Baltic and North Sea) have not put in place the needed measures to replace discard plans.</p>	<p>Little progress Legislative</p>
<p>Action 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</p>	<p>The implementation of the Marine Strategy Framework Directive is overall unsatisfactory and has had significant delays, as found by assessment of monitoring (92) and programmes of measures (93). Only seven Member States had their monitoring programmes in place by 2014 for most indicators. The programme of measures</p>	<p>Little progress Legislative, financing</p>

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.

had varying levels of ambition, but for none of descriptors more than half of the Member States indicated that good environmental status would be achieved by 2020.

There has been much legislative progress on eliminating incidental catch of sensitive species, but progress has been too slow to have measures in place by 2020. The Technical Measures Regulation aims to minimise and where possible eliminate bycatch of sensitive marine species, including species protected under EU nature legislation. The Regulation requires Member States to implement actions on the basis of scientific advice, and mandatory actions are foreseen for longline fisheries (88).

In addition, the Data Collection Regulation (89) included the collection of data on bycatch of seabirds, cetaceans and other species protected under EU and international legislation, but the implementation will depend to a large extent on the national programmes and financial commitments.

The EU adopted a Seabird Action Plan in 2012 (90). A review of implementation of the plan found that apart from the significant engagement by NGOs, there had been little action by Member States (91).

The EMFF 2014-2020 provided the opportunity to fund implementation of the Marine Strategy Framework Directive, Natura 2000 protection and management, biodiversity and ecosystem services (94).

Detailed tracking of the spending under the EMFF on the Marine Strategy Framework Directive is difficult due to the broad headings, but a conservative estimate suggests that 15 % of the EMFF budget was spent on biodiversity (95).

<p>Target 5 By 2020, Invasive Alien Species 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.</p>	<p>The Regulation on Invasive Alien Species was adopted in 2014 (96). A scientific review of the regulation found the legislation to be innovative and incorporating a strong hierarchical approach to invasions, with the only major weakness being a heavy reliance on process for listing Invasive Alien Species of EU concern and the absence of a financial mechanism (97). As per January 2019 in total 49 species are listed and another 69 had risk assessment at various stages of development (98). It should be noted that this is still far below the 207 priority species identified for listing by 2020 by a scientific review (99). The Ballast Water Convention entered into force in 2016 (100). Since 2010, most coastal EU Member States have ratified the Convention, with the exception of the Ireland, Italy, Poland, Romania, Slovenia and the UK.</p>	<p>Substantial progress</p>
<p>Action 15 The Commission will integrate additional biodiversity concerns into the Plant and Animal Health regimes by 2012</p>	<p>The revised Plant Health Regulation (101) includes the possibility to list pests impacting biodiversity and native plants. The Animal Health Regulation (102) includes the possibility to list diseases impacting biodiversity and the environment. A major pressure on amphibians, the disease <i>Batrachochytrium salamandrivorans</i> has already been proposed for listing (103).</p>	<p>Completed Legislative</p>
<p>Action 16 The Commission will fill policy gaps in combating IAS by developing a dedicated legislative instrument by 2012</p>	<p>See Target 5.</p>	<p>Completed Legislative</p>

<p>Target 6 By 2020, the EU has stepped up its contribution to averting global biodiversity loss.</p>	<p>The EU Member States and a large part European Commission have substantially increased their contribution to averting global biodiversity loss through development funding (104). However, work on phasing out environmentally harmful subsidies and reducing the biodiversity impacts of EU consumption patterns has only made little progress.</p>	<p>Little progress</p>
<p>Action 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</p>	<p>The EU Flagship initiative on Resource Efficiency did not include measures to reduce biodiversity impacts of EU consumption patterns outside the EU, although it did include actions on analysing environmental footprints and improving the knowledge base (105). The political priority has then shifted towards Circular Economy. However, the commodities which are likely to cause the highest biodiversity impacts abroad can mostly not be addressed through recycling (106). The only exception is cotton, which has been addressed under the Circular Economy Package (107).</p>	<p>Failure Legislative</p>
<p>Action 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 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.</p>	<p>The EU trade agreement with Canada (108) did not include provisions on biodiversity. The other trade agreements with Japan (109) and the Colombia-Peru, Moldova and Georgia (110) all include a chapter on sustainable development with reference to biodiversity, although the nature of the provisions varies substantially. However, substantial risks have emerged under trade agreements in respect to the Investor-Dispute Settlement Mechanisms (111), which have the potential to undermine environmental legislation and its implementation. This action is therefore not assessed.</p>	<p>Not assessed</p>

<p>Action 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.</p>	<p>A study investigating environmentally harmful subsidies in 2012 found that there was a large diversity of such subsidies being granted, leading to loss of government income and adverse environmental and social impacts (112). The study recommended several measures, including a systematic inventory of environmentally harmful subsidies and a reform of EU State Aid legislation and sectoral policies. By the end of 2018 there had been no systematic inventory, in spite of the EU committing to do this under the Aichi Target 3 milestones in 2016 (113). The current level of funding for Natura 2000, including incentives, is insufficient (see Action 2).</p>	<p>Failure Other policy initiative</p>
<p>Action 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.</p>	<p>The spending of Official Development Assistance on biodiversity has likely moderately increased compared to the previous Multi-Annual Financial Framework. The average yearly contribution of the EU under Official Development Assistance was EUR 221 million in 2007-2013 (114), and the average yearly contribution in the budgets of 2015, 2016 and the draft budget of 2017 was 240 million EUR (115). It should be noted that in the 2007-2013 period spending significantly increased towards the end of the period.</p> <p>A quick scan of 17 Member States that reported their biodiversity expenditure and a baseline for 2010 to the CBD Clearing House Mechanism indicated that most of them increased the average yearly spending on biodiversity by more than 65 % (116). In these Member States real spending over 2011-2015 increased by 72 % compared to the baseline or by an estimate of 533 million EUR.</p> <p>The only major donors that reported that their funding had decreased were Spain and the Netherlands. This increase in</p>	<p>Substantial progress Legislative, financing</p>

	<p>spending is accompanied by an increase in total development funding in the EU (117). Note that for final conclusions an independent evaluation of the application of the Rio markers would be required.</p>	
<p>Action 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.</p>	<p>The Commission has supported natural NBSAPs in the pan-European region (118) and has contributed to natural capital assessments in Brazil, China, India, South Africa and Mexico (119). The Biodiversity for Life Flagship Initiative included a B4Life facility to improve coordination in development (120), and the strategies Larger than Elephants (121) and Larger than Tigers (122) are a significant step forward to a strategic approach for global biodiversity conservation.</p>	<p>Substantial progress Other policy initiative</p>
<p>Action 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.</p>	<p>The Commission has produced guidance for its officials and the Member States to mainstream environment and climate in 2016 (123) in development cooperation action and to help them with Strategic Environmental Assessments in 2017 (124). The guidance together produces a complete framework for mainstreaming biodiversity, including through programming, screening and policy dialogue, and identifies a series of environmentally sensitive sectors. It is not yet possible to assess to what extent the guidance has been adhered to.</p>	<p>Substantial progress Other policy initiative</p>
<p>Action 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.</p>	<p>The Regulation on the Nagoya Protocol was adopted in 2014 (125). The EU has ratified the protocol in 2014 (126). It should be highlighted here that the first report under the Regulation showed that implementation and enforcement by Member States was slow and uneven and several infringement procedures were launched by the Commission (127).</p>	<p>Completed Legislative</p>

Lessons learned

The first and most important lesson is that by the end of 2018 the European Commission and the Member States had been largely unsuccessful in implementing actions that required legislation, financing or implementation of existing legislation or enforcement, as can be seen in table 3. There has been a lower degree of success on these actions (less than 30 %) than on actions involving other policy initiatives (more than 60 %). There were several major actions that failed, in particular financing for Natura 2000 in the EU, several actions for conservation of biodiversity in grassland and cropland ecosystems under the Common Agricultural Policy and action to address the effects of EU consumption patterns on biodiversity outside the EU.

The second lesson from the evaluation of the progress at the end of 2018 is that the design of the Biodiversity Strategy to 2020 had several weaknesses. When assessing the current Strategy against the criteria that have been developed for improving the Strategic Plan for Biodiversity after 2020 (128), the following weaknesses were evident:

- **Many targets and actions were not specific enough.** Notably Target 3 refers maximising the agricultural area that is covered by biodiversity-related measures, without providing any further specification to what ‘maximising’ means in this context. Target 6 aims to step up the EU contribution to halting global biodiversity loss, also without further specification what ‘stepping up’ means.
- **The Strategy in many cases did not clearly assign specific responsibilities.** In total 11 actions were the responsibility of the Commission and the Member States together, without providing a further division of activities. This was problematic as the Commission and the Member States have very different powers under the Treaty (2), especially relating to enforcement and financial resources. Action 14A and 17A refer to ‘the EU’ also without assigning responsibilities in detail.
- **There was neither reporting by EU Member States, nor any other mechanism to track national implementation.** This was very problematic for measuring progress towards several targets and actions, such as Action 10 on genetic resources or action 11A on forest management plans, as even the Commission was unable to assess progress (9). More importantly it also precluded the adjustment of actions in the mid-term review of the strategy in 2015.
- **The information on conservation status matched poorly with the time frame of the Strategy.** The State of nature in the EU, with the conservation status for species and habitat types protected under EU nature legislation, was published in 2015 (21), and was partially based on information before 2010 before the current Strategy was in place. This made it impossible to draw conclusions on the effectiveness of the Strategy on conservation status, arguably the most important variable for implementation of the Strategy.
- **The actions under Target 2 and Target 5 were insufficiently ambitious to achieve these targets.** Target 2 refers to restoration of 15 % of degraded ecosystems by 2022, without specifying what degraded ecosystems are or what would constitute restoration, and with no supporting actions or commitment to allocate financial resources to implement this target. Human activities have had high or very high impacts on most of the ecosystems present in the EU (129) and these ecosystems are in a degraded state as a result. Restoring 15% of the EU’s entire territory is not possible within 10 years. This could have been mitigated to some extent by action 6A which refers to a ‘strategic framework for priorities for ecosystem restoration’, but unfortunately most Member States and the Commission failed to implement this action. In contrast, Target 5 had a

better timeframe, but while with the adoption of the Regulation on Invasive Alien Species in 2014 much initial progress has been made, it would not have been possible control the priority invasive alien species or eradicate them by 2020.

- **Target 4 and some actions added little value to existing ambitions and commitments.** Including timebound implementation targets in the Biodiversity Strategy was useful in cases where no formal timeline formal implementation exists, such as Target 1, as this contributed to policy coherence (28). However, achieving Good Environmental Status by 2020 was an existing legal obligation under the Marine Strategy Framework Directive (130) and even achieving MSY by 2015 was an existing commitment from the World Summit on Sustainable Development at Johannesburg in 2002 (131). Notably, the achievement of MSY was then postponed under the CFP until 2020 (132) rendering the Target meaningless. Similarly, the implementation of management plans or equivalent instruments and the completion of the Natura 2000 networks are existing legal obligations under the EU Habitats Directive (133) and should have been completed for more than 9 000 Natura 2000 areas already by the end of 2010 (see action 1C).
- **There are structural problems with biodiversity tracking and broader financial reporting.** There is no tracking for expenditure on Natura 2000, and a review of tracking of biodiversity expenditure found large deficiencies (17). The absence of an ex-post evaluation of the Rural Development for 2007-2012, six years after the completion of the programme, is strange. Tracking expenditure and area under EFAs is very difficult (52). The lack of reliable and recent information on expenditure on biodiversity and Natura 2000 hampers the measurement of available and actual funding, which is required for implementation of several actions under the Strategy.
- **Major failures are emerging in the implementation of wider EU environmental policy and in policy coherence with other sectors.** Some of the actions that the Commission and the Member States failed to achieve or achieved on little progress on, are horizontal actions whose relevance goes much beyond biodiversity. The failure to address consumption patterns under Resource Efficiency Flagship Initiative (action 17A) and on phasing out of environmentally harmful subsidies (17C) are not only a failure to address biodiversity loss but also to tackle climate change and other forms of environmental degradation. Similarly, the failure on greening (action 8A) and on cross-compliance (8B) should be seen in a broader context of insufficient consideration of environmental objectives within the CAP (52).

Conclusions and recommendations

At the end of 2018, the EU Biodiversity Strategy to 2020 was for the most part a failure. Biodiversity loss has continued, and while there have been no documented extinctions in the EU the conservation status is considerably worse compared to the 2010 baseline. There had been substantial progress in achieving only one out of the six targets. Little progress has been made towards strategically restoring degraded ecosystems and increasing green infrastructure, ending overfishing and the EU has only stepped up its contribution to halting global biodiversity loss to only to a little degree, leaving the effects of its consumption unaddressed. The status of species and habitat types linked to agriculture is deteriorating, and the 2013 CAP reform has failed to address the causes of this decline. This failure to make progress in meeting its own biodiversity targets undermines the credibility of the EU as a leader in international environmental policy.

The majority of actions also saw little progress or outright failure. Actions that were fully implemented were in general policy initiatives that did not involve new legislation, financial resources, enforcement or implementation of existing legislation. This suggests a lack of high-level political commitment to save biodiversity. The Regulation on Invasive Alien Species stands out as a major success, although much will depend on the addition of priority species to the list. Other substantial progress has been made on increasing the EU contribution to financing action on biodiversity worldwide, the expansion of the Natura 2000 network, in particular in the marine environment, other measures to address invasive alien species under the Plant and Animal Health legislation and mapping and assessing ecosystems and their services.

Substantial progress can be still made before 2020 on some actions. Given the short timeline, the focus is on actions that involve implementation and enforcement of existing legislation and other policy initiatives described in table 2. The following actions are recommended as a priority:

- 1) The Commission should progress existing infringement procedures on the management and protection of the Natura 2000 network.** The decrease in Letters of formal notice (39), and the delay in processing complaints by NGOs (134) indicate a decrease in enforcement efforts in contrast with the Commission's commitment under Strategy (Action 3C), while progress on management of Natura 2000 is urgently needed.
- 2) The Commission should restart the work on restoring degraded ecosystems, by strengthening the linkages to climate change mitigation and adaptation.** The work on the restoration of degraded ecosystems has failed (action 6A). However, there is a large volume of work that can form the basis for action beyond 2020 if the preparation starts now. In particular linking restoration to nature-based solutions (135) and climate change mitigation (136) and adaptation (137), combined with methods for priority setting (138) can result in a more streamlined agenda for action that can be included in the next Biodiversity Strategy. Concretely, the Commission can already start now with the development of a strategic framework to set priorities for ecosystem restoration at EU level.
- 3) The Member States should roll out emergency agri-environmental measures for species with Species Action Plans.** Concrete and detailed proposals for agri-environmental measures exist in several Species Action Plans, such as the Breeding Waders Multispecies Action Plan (139) and the Bats Action Plan (140).

4) The Commission should take emergency measures to put overfished populations on track to Maximum Sustainable Yield, and to eliminate incidental catches for priority seabirds and marine mammals.

The monitoring of the CFP indicated that for some stocks the exceedance of FMSY was very high, with fishing mortality exceeding FMSY in 16 stocks by a factor 2 or more (81). The Commission has on the request of the UK taken measures for Seabass (*Dicentrarchus labrax*), and should now act on its own initiative for other stocks. Similarly, there are several urgent cases of incidental catches of protected species, including cetaceans (141) and seabirds (142) (143).

5) The Commission should start the process to add all priority species to the EU list of invasive Alien Species. A scientific review identified 207 priority species identified for listing by 2020 (99). Given the considerable overlap with the species that are currently being prepared for listing or already have risk assessment, the entire set of 207 species should be assessed and listed if meeting the criteria in the Regulation by 2020, putting Target 5 on track to achievement.

6) The Commission should start the work on an inventory of environmentally harmful subsidies in the EU. An inventory of environmentally harmful subsidies is a necessary first step to their phaseout (112) as foreseen under Target 6. This is also an existing commitment under the Aichi Targets (113).

7) The Commission should identify priority commodities to address in terms of the effects of EU consumption patterns on biodiversity inside and outside the EU. Since 2010 there have been several major studies on the impacts of global trade on biodiversity (144) (145). The Commission also has its own study on the topic (146). A more detailed priority setting would be useful, in particular to identify overlaps with climate and water footprints.

In addition the Commission and the Member States needs to improve the tracking of financing for biodiversity and financing for Natura 2000 in their budgets. An improved tracking of biodiversity will make it possible to draw robust conclusions on the performance of the current Biodiversity Strategy, the contributions of the different EU funds, notably the EAGF and the EFRD, and other funding sources. The tracking should separate direct funding from indirect funding, as estimating biodiversity financing is very sensitive to the correct application of the Rio markers (17). A separate tracking of financing of biodiversity and Natura 2000 is necessary given the specific commitments under the Aichi Targets and the EU Habitats Directive.

The next EU Biodiversity Strategy needs to be stronger. In particular, the Strategy should have specific and unambiguous targets and actions, which should be formulated on established principles for developing such targets (128). Information on implementation also needs to be improved, by having a reporting mechanism or clearing house mechanism to track implementation, and use available monitoring of biodiversity such as remote sensing in between the State of Nature Reports to track implementation. The actions should be sufficiently ambitious to achieve the targets, and targets and actions should have added value above existing legal obligations. Finally, Strategy should be a comprehensive framework to address biodiversity loss. The European Commission and the EU Member States need to ensure that the drivers behind biodiversity loss are addressed, in particular through reducing the impacts of EU consumption and the phase out of environmentally harmful subsidies, for the good of nature, the climate and the world we live in.

Acknowledgements

A special thanks to Ariel Brunner and Barbara Herrero Cangas (BirdLife Europe and Central Asia) for their support throughout the work, and to Alistair Taylor (Royal Society for the Protection of Birds RSPB) for greatly improving the document. I would like to thank the following people for their helpful comments and input: Georgian Chandler, Euan Dunn, Neil Douglas, Richard Gregory, Sian Williams (RSPB) and Bruna Campos, Harriet Bradley, Marianna Colonna and Honey Kohan (BirdLife Europe and Central Asia).

References

1. Rockström J et al. (2009) A safe operating space for humanity. *Nature* 461(7263) 472.
2. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012E/TXT>
3. <http://ec.europa.eu/environment/legal/crime/>
4. http://ec.europa.eu/environment/forests/timber_regulation.htm
5. Jordan, A (2012) *Environmental policy in the European Union: actors, institutions, and processes*. Earthscan, London.
6. <https://www.cbd.int/nbsap/related-info/region-bsap/default.shtml>
7. <https://biodiversity.europa.eu/policy/target-1-and-related-aichi-targets>
8. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0478>
9. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015SC0187>
10. BirdLife Europe and Central Asia (2015) *Halfway there? Mid-term assessment of progress on the EU 2020 Biodiversity Strategy*. BirdLife, Brussels.
11. BirdLife Europe and Central Asia (2012) *On the Road to Recovery? BirdLife Assessment of Progress on the EU 2020 Biodiversity Strategy*. BirdLife, Brussels.
12. Milieu, IEEP and ICF (2016) *Evaluation Study to support the Fitness Check of the Birds and Habitats Directives, 2016*.
13. European Commission (2016) *Commission Staff Working Document: Fitness Check of the EU Nature Legislation (Birds and Habitats Directives. SWD(2016) 472 final*. Luxembourg.
14. http://ec.europa.eu/environment/nature/legislation/fitness_check/action_plan/index_en.htm
15. http://ec.europa.eu/environment/nature/conservation/species/pollinators/index_en.htm
16. <https://circabc.europa.eu/w/browse/0c011fbc-edd4-49a6-8f3d-b67901a2084d>
17. Ernst and Young et al. (2017) *Study on biodiversity financing and tracking biodiversity-related expenditures in the EU budget*. Project number: ENV.B.2/ETU/2014/0031, 2017.
18. <https://www.cbd.int/chm/>
19. <http://ec.europa.eu/budget/graphs/inforeuro.html>
20. <https://www.iucnredlist.org>
21. <https://www.eea.europa.eu/publications/state-of-nature-in-the-eu>
22. Kukkala AS et al. (2016) Coverage of vertebrate species distributions by important bird and biodiversity areas and special protection areas in the European union. *Biological Conservation* 202: 1-9
23. Ramirez I et al. (2017) How well is the EU protecting its seabirds? Progress in implementing the Birds Directive at sea. *Marine Policy* 81 (2017): 179-184
24. <https://www.eea.europa.eu/publications/eu-2010-biodiversity-baseline>
25. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2019:30:FIN>
26. <https://www.eea.europa.eu/data-and-maps/data/natura-9>
27. http://ec.europa.eu/environment/nature/natura2000/platform/events/index_en.htm
28. Milieu, IEEP and ICF (2016) *Evaluation Study to support the Fitness Check of the Birds and Habitats Directives, 2016*
29. http://ec.europa.eu/environment/nature/natura2000/financing/index_en.htm
30. Pe'er G et al. (2017). *Is the CAP fit for purpose? An evidence-based fitness check assessment*. German Centre for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig
31. European Commission (2011) *Financing Natura 2000. Investing in Natura 2000: Delivering benefits for nature and people*. Staff working paper SEC (2011) 1573 final. EC, Brussels

32. <http://ec.europa.eu/environment/nature/natura2000/awards/>
33. <http://ec.europa.eu/environment/nature/natura2000/EUnatura2000day>
34. http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm
35. http://ec.europa.eu/environment/nature/conservation/index_en.htm
36. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015SC0187>
37. <https://www.environmentalprosecutors.eu/eu-life-project>
38. http://ec.europa.eu/environment/aarhus/pdf/notice_accesstojustice.pdf
39. <http://ec.europa.eu/atwork/applying-eu-law/infringements-proceedings>
40. <https://bd.eionet.europa.eu/activities/Reporting>
41. <https://biodiversity.europa.eu>
42. https://biodiversity.europa.eu/maes/maes_countries
43. <https://biodiversity.europa.eu/maes/mapping-ecosystems>
44. Maes J et al. (2018) Mapping and Assessment of Ecosystems and their Services: An analytical framework for ecosystem condition. Publications office of the European Union, Luxembourg.
45. http://ec.europa.eu/environment/nature/biodiversity/strategy/target2/index_en.htm
46. Lammerant J et al. (2013) Implementation of 2020 EU Biodiversity Strategy: Priorities for the restoration of ecosystems and their services in the EU. Report to the European Commission. ARCADIS (in cooperation with ECNC and Eftec), Brussels.
47. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52013DC0249>
48. IEEP and Milieu (2013). The Guide to Multi-Benefit Cohesion Policy Investments in Nature and Green Infrastructure. A Report for the European Commission. Brussels.
49. <https://www.eib.org/en/projects/pipelines/pipeline/20180050.htm>
50. <http://ec.europa.eu/environment/nature/biodiversity/comm2006/proofing.htm>
51. European Commission (2017) Public Consultation on the future EU Initiative on No NetLoss of Biodiversity and Ecosystem Services. Available on <http://ec.europa.eu/environment/nature/biodiversity/nnl/pdf/NoNetLoss%20statistics%20analysis.pdf>
52. Pe'er G et al. (2017). Is the CAP fit for purpose? An evidence-based fitness check assessment. German Centre for Integrative Biodiversity Research (iDiv), Halle-Jena-Leipzig
53. https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/country-files/common/rdp-factsheet_en.pdf
54. ÖIR et al. (2012) Synthesis of Mid-Term Evaluations of Rural Development Programmes 2007-2013. Österreichisches Institut für Raumplanung, Vienna.
55. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52011PC0625>
56. https://www.eca.europa.eu/Lists/ECADocuments/SR17_21/SR_GREENING_EN.pdf
57. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:392:FIN>
58. https://www.eca.europa.eu/Lists/ECADocuments/OP18_07/OP18_07_EN.pdf
59. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52011PC0628>
60. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32013R1306>
61. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32009R0073>
62. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:392:FIN>
63. https://www.eca.europa.eu/Lists/ECADocuments/OP18_07/OP18_07_EN.pdf
64. https://www.eca.europa.eu/Lists/ECADocuments/SR17_7/SR_CERTIFICATION_BODIES_EN.pdf
65. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32014R0808>
66. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32013R1305>
67. <https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32013R1307>
68. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015SC0187>
69. <http://www.geneticresources.eu>
70. https://ec.europa.eu/info/law/better-regulation/initiatives_en
71. <https://www.eea.europa.eu/data-and-maps/indicators/livestock-genetic-diversity/livestock-genetic-diversity-assessment-published>
72. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R1305>
73. https://ec.europa.eu/agriculture/sites/agriculture/files/evaluation/rural-development-reports/2015/ex_ante_rdp_synthesis_2014_2020/fulltext_en.pdf

74. [ORÉADE-BRÈCHE and IEEP \(201&\) Evaluation study of the forestry measures under Rural Development. Alliance Environnement, Auzeville.](#)
75. https://ec.europa.eu/agriculture/sites/agriculture/files/evaluation/rural-development-reports/2015/ex_ante_rdp_synthesis_2014_2020/fulltext_en.pdf
76. <http://ec.europa.eu/environment/life/project/Projects/index.cfm>
77. http://ec.europa.eu/environment/forests/pdf/fmp_table.pdf
78. <https://www.eib.org/en/products/blending/ncff/project-examples/index.htm>
79. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015SC0187>
80. http://ec.europa.eu/environment/forests/pdf/fmp_table.pdf
81. <https://stecf.jrc.ec.europa.eu/web/stecf/reports/cfp-monitoring>
82. <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1495097018132&uri=CELEX:32017D0848>.
83. García-Isarch E et al. (2016) Scientific advice on the estimation of surplus for Sustainable Fisheries Partnership Agreements. Specific Contract No. 10 under Framework Contract No. MARE/2012/21. Brussels.
84. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.191.01.0001.01.ENG
85. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32018R0973> .
86. <https://stecf.jrc.ec.europa.eu/web/stecf/reports>
87. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R1380>
88. http://www.europarl.europa.eu/doceo/document/TA-8-2019-0381_EN.html
89. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R1004>
90. <http://ec.europa.eu/transparency/regdoc/rep/1/2012/EN/1-2012-665-EN-F1-1.Pdf>
91. JWGBIRD (2017) Report of the OSPAR/HELCOM/ICES Working Group on Marine Birds (JWGBIRD). ICES CM 2016/ACOM:29. Thetford, UK.
92. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2017:3:FIN>
93. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:562:FIN>
94. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R0508>
95. Ernst and Young et al. (2017) Study on biodiversity financing and tracking biodiversity-related expenditures in the EU budget. Project number: ENV.B.2/ETU/2014/0031, 2017.
96. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R1143>
97. Genovesi P et al. (2015) EU adopts innovative legislation on invasive species: a step towards a global response to biological invasions?. *Biological Invasions* 17.5 (2015): 1307-1311
98. http://ec.europa.eu/environment/nature/invasivealien/list/index_en.htm
99. Carboneras C et al. (2018) A prioritised list of invasive alien species to assist the effective implementation of EU legislation. *Journal of Applied Ecology* 55.2 (2018): 539-547
100. <http://www.imo.org/en/About/Conventions/StatusOfConventions/Documents/Status%20-%202019.pdf>
101. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32016R2031>
102. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2016:084:FULL>
103. https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2018-2321919_en
104. <https://www2.compareyourcountry.org/oda?cr=oced&lg=en>
105. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0571>
106. Lammerant J et al., (2014) Identification and mitigation of the negative impacts of EU demand for certain commodities on biodiversity in third countries. Contract ENV.B.2/ETU/2012/0045r. Arcadis, Brussels.
107. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0190>
108. <http://ec.europa.eu/trade/policy/in-focus/ceta>
109. <http://ec.europa.eu/trade/policy/in-focus/eu-japan-economic-partnership-agreement>
110. <http://ec.europa.eu/trade/policy/countries-and-regions>
111. <https://corporateeurope.org/international-trade/2019/01/investor-privileges-vs-people-and-planet>
112. Withana S et al. (2012) Study supporting the phasing out of environmentally harmful subsidies. Institute for European Environmental Policy (IEEP), Institute for Environmental Studies - Vrije Universiteit (IVM), Ecologic Institute and VITO, Brussels.
113. <https://www.cbd.int/doc/decisions/cop-12/cop-12-dec-03-en.pdf>.
114. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015SC0187>.

115. Ernst and Young et al. (2017) Study on biodiversity financing and tracking biodiversity-related expenditures in the EU budget. Project number: ENV.B.2/ETU/2014/0031, 2017.
116. <https://www.cbd.int/chm/>.
117. <https://www2.compareyourcountry.org/oda?cr=oeecd&lg=en>
118. UNEP-WCMC (2016) Indicators and Information Systems for biodiversity and development - guidance from the Pan European region. UNEP-WCMC, Cambridge.
119. <https://seea.un.org/>
120. <https://europa.eu/capacity4dev/b4life>
121. https://ec.europa.eu/europeaid/sites/devco/files/eu-wildlife-strategy-africa-synthesis-2015_en_0.pdf
122. <https://publications.europa.eu/en/publication-detail/-/publication/93b375bc-4769-11e8-be1d-01aa75ed71a1/language-en>
123. https://ec.europa.eu/europeaid/sites/devco/files/guidelines-env-climate-change-sust-dev-20160201_en.pdf.
124. <https://europa.eu/capacity4dev/public-environment-climate/documents/strategic-environmental-assessment-eu-development-cooperation-handful-tips-get-it-right>.
125. <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32014R0511>
126. <https://www.cbd.int/abs/nagoya-protocol/signatories>
127. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2019:13:FIN>
128. Green EJ et al. (2019) Relating characteristics of global biodiversity targets to reported progress. Conservation Biology: <https://doi.org/10.1111/cobi.13322>
129. <https://www.eea.europa.eu/publications/european-ecosystem-assessment>
130. http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/marine-strategy-framework-directive/index_en.htm
131. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32013R1380>
132. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R1380>
133. http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
134. BirdLife Europe and Central Asia et al. (2018). Nature's Last line of Defense. Available on <https://bit.ly/2rKGR9i>
135. <https://ec.europa.eu/research/environment/index.cfm?pg=nbs>
136. <https://www.ecologic.eu/sites/files/publication/2017/2134-eu-climate-policies-friend-foe-or-bystander-to-forest-restoration.pdf>
137. https://ec.europa.eu/clima/sites/clima/files/docs/factsheet_adaptation_2014_en.pdf
138. Eftec et al. (2017) Promotion of ecosystem restoration in the context of the EU biodiversity strategy to 2020. Report to European Commission, DG Environment. Eftec, London.
139. Leyrer J et al. (2018) International Multi-species Action Plan for the Conservation of Breeding Waders in Wet Grassland Habitats in Europe (2018-2028). Report of Action A13 under the framework of Project LIFE EuroSAP (LIFE14 PRE/UK/002). NABU, RSPB, VBN and SOF.
140. Barova S and Streit A (editors) (2018) Action Plan for the Conservation of All Bat Species in the European Union 2018-2024. European Commission, UNEP and Eurobats, Brussels. Available on http://ec.europa.eu/environment/nature/conservation/species/action_plans/pdf/EU%20Bats%20Action%20Plan.pdf
141. Dolman S et al. (2016) Towards an EU action plan on cetacean bycatch. Marine Policy 72 (2016): 67-75.
142. Genovart M et al. (2016) Demography of the critically endangered Balearic shearwater: the impact of fisheries and time to extinction. Journal of Applied Ecology 53.4 (2016): 1158-1168.
143. Genovart M et al. (2018) Varying demographic impacts of different fisheries on three Mediterranean seabird species. Global change biology 23.8:3012-3029.
144. Lenzen M et al. International trade drives biodiversity threats in developing nations. Nature 486.7401: 109.
145. Crenna E, Sinkko T and Sala S (2019) Biodiversity impacts due to food consumption in Europe. Journal of Cleaner Production 227: 378-391.
146. http://ec.europa.eu/environment/nature/pdf/study_third_countries.pdf
147. Gregory RD et al. (2019) An analysis of trends, uncertainty and species selection shows contrasting trends of widespread forest and farmland birds in Europe. Ecological Indicators 103 (2019): 676-687.