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## Audit preview

Information on an upcoming audit



## Biodiversity in farming

May 2019

Biodiversity encompasses the variety of ecosystems, habitats and species on which human beings are dependent. It also has social and economic value. Biodiversity in the EU is in a continuous, strong decline. The largest contributor to biodiversity loss is agriculture.

The EU adopted its most recent Biodiversity Strategy in 2011. The strategy contains a set of targets and actions to halt the loss of biodiversity and ecosystem services by 2020. The main EU tools addressing farmland biodiversity derive from the common agricultural policy (CAP).

The European Court of Auditors is carrying out an audit to assess whether the EU's agriculture policy has contributed to maintaining and enhancing biodiversity by 2020. In particular, we will examine the design of the current EU biodiversity strategy and the CAP legal framework, as well as the implementation, monitoring and evaluation of the different EU-financed measures promoting biodiversity. The audit includes visits to the Commission and relevant authorities in five Member States (Germany, Ireland, Poland, Cyprus and Romania).

Biodiversity has also been discussed in other recent ECA special reports on cross-compliance<sup>1</sup>, Natura 2000<sup>2</sup>, Greening<sup>3</sup> and Baltic Sea eutrophication<sup>4</sup>.

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## Introduction

Biodiversity means the number, variety and variability of living organisms and how these change from one location to another and over time<sup>5</sup>. It is important in all ecosystems – both “natural” ones and those managed by humans. Biodiversity is also the basis of many natural benefits provided by ecosystems (“ecosystem services”), such as water recycling, soil retention, pollination of plants, regulation of climate, and pest control.

The World Economic Forum has recognised the loss of biodiversity and collapse of ecosystems as one of the top 10 threats facing the world, in terms of likelihood and impact<sup>6</sup>.

“Biological diversity” means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems.

*Source: Article 2 of the United Nations Convention on Biological Diversity.*

## Agricultural biodiversity in Europe: key issues

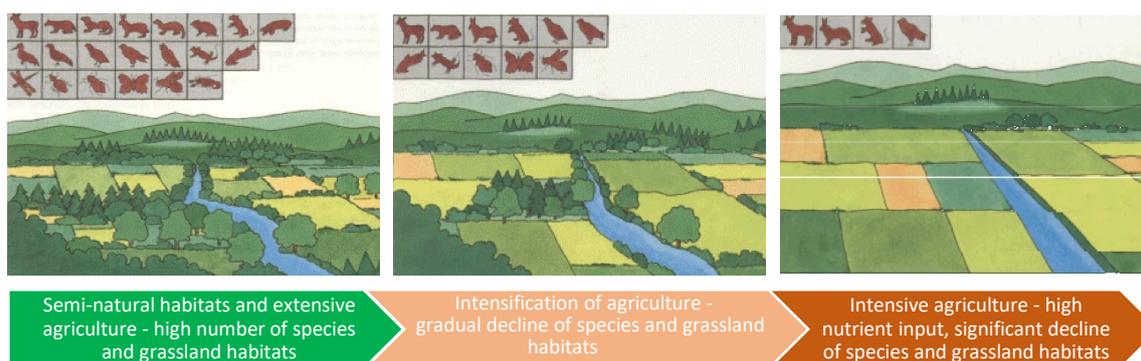
Agricultural biodiversity refers to all ecosystems and life forms directly related to farming. This includes rare seed varieties and animal breeds (farm biodiversity), but also many other organisms such as soil fauna, weeds, pests, predators, and all of the native plants and animals (wild biodiversity) existing on and passing through a farm<sup>7</sup>. Farmed crops interact with organisms in natural ecosystems and depend on them to produce their output. Such dependencies include soil fertility provided by soil organisms, the reduction of pests by their natural enemies and the pollination of plants by insects<sup>8</sup>.

Agriculture is the largest contributor to biodiversity loss<sup>9</sup>. The current biodiversity situation in Europe reflects the impact of the development and expansion of farming in the past few centuries. Biodiversity is also affected by land-use change and habitat fragmentation and destruction, climate change and invasive alien species<sup>10</sup>.

## Intensive and extensive farming

Biodiversity generally decreases when the intensity of farming increases<sup>11</sup>. Farming has become ever more industrial, and farmers are tending to specialise, focusing on a few or even single high-output species or varieties. The result has been increased use of chemicals and machinery, and more open and homogeneous landscapes<sup>12</sup>. This loss of diversity increases the risk of declining yields due, for example, to loss of disease resistance or environmental tolerance, or to decreasing vitality, fertility or fitness caused by inbreeding (the production of offspring from the mating or breeding of individuals or organisms that are closely related genetically). Losing genetic diversity means irretrievably losing future breeding options. This may also reduce the capacity of ecosystem to adapt to unforeseeable disease risks or to environmental variations like climate change (see [Figure 1](#)).

**Figure 1 – Changes of biodiversity on farmland due to intensification of farmland use**



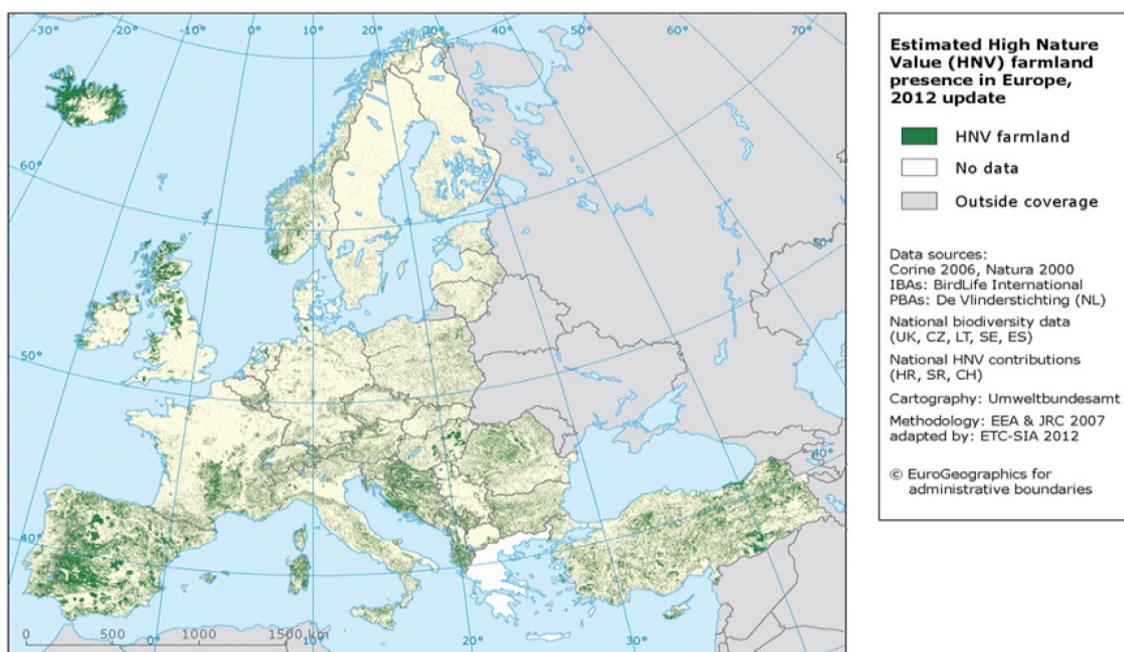
Source: ECA, based on *Landesanstalt für Umweltschutz Baden-Württemberg, Landschaft natürlich* (1992).

Intensive livestock farming is claimed to have an undesirable effect on biodiversity: a 2015 study by different scientists, including from the European Commission's Joint Research Centre (JRC), estimates that livestock farming accounts for 78 % of agriculture's negative impact on biodiversity<sup>13</sup>. This detrimental impact has also been highlighted by the UN Food and Agriculture Organization (FAO)<sup>14</sup>. Livestock farming is a major source of surplus nitrogen and phosphorous pollution<sup>15</sup>. These chemicals can cause excess vegetation and algae growth in lakes and rivers, depriving them of oxygen. This process, known as eutrophication, further harms biodiversity<sup>16</sup>.

Extensive farming, which uses less fertiliser, pesticides and machinery relative to land area, is generally less harmful to biodiversity. Extensive farming includes the category of High Nature Value (HNV) farming. HNV farmland is low-intensity farmland that promotes or is associated with high biodiversity, in terms of species or habitats, and therefore plays a role in maintaining European biodiversity<sup>17</sup>. In fact, the survival of many species and habitats on HNV farmland, and hence its biodiversity, is often dependent on such extensive farming activity.

HNV farmland accounts for around 30 % of farmland used in the EU<sup>18</sup>. **Figure 2** presents a geographical distribution of such farmland. Socio-economic pressures on extensive farming create the risk of farmers abandoning HNV farmland, thus threatening this biodiversity.

**Figure 2 – Estimated HNV farmland presence in Europe in 2012**



Source: European Environment Agency, 2012.

## Diversity of genetic resources

Genetic resources refer to animals, plants, micro-organisms and invertebrates which are used for food, agriculture and forestry<sup>19</sup>. The European Commission acknowledged in 2013<sup>20</sup> that the sustainable use of and diversity of genetic resources needed greater attention. In terms of breeding, the Commission emphasised the need to focus on underutilised species, traditional and local breeds and crops.

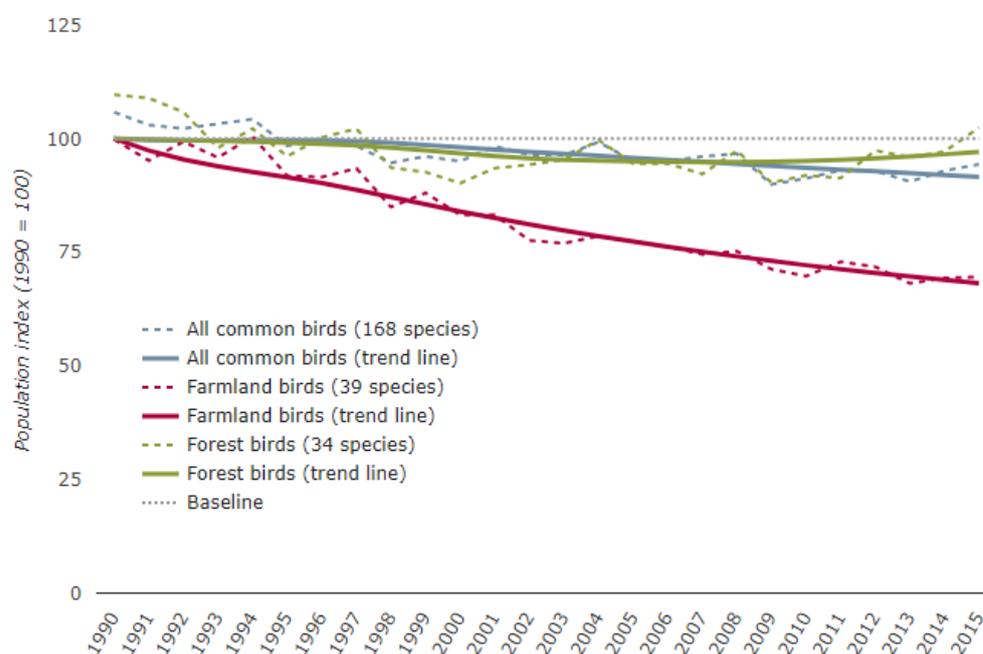
## Soil biodiversity

Soil plays a vital role in biodiversity. Underground life, from bacteria and fungi to tiny insects, earthworms and moles, is essential for healthy farmland and sustainable agriculture. Its benefits include recycling nutrients and enhancing plant health, storing and purifying water, preventing erosion and even mitigating climate change. Soils are home to over a quarter of all living species<sup>21</sup>. The JRC has estimated the monetary value of soil biodiversity's contribution to ecosystem services at between €1.2 trillion and €10 trillion. It has also concluded that, because of the limited state of understanding of the consequences of soil biodiversity, further efforts will be necessary to know potential risks. However, soil is unquestionably under pressure because of threats such as erosion, contamination, salinisation and sealing<sup>22</sup>. The Global Soil Biodiversity Atlas has identified nine main threats, including loss of biodiversity above ground, farming practices (such as intensive tillage systems, fertiliser and pesticide applications, and monoculture) and overgrazing<sup>23</sup>.

## Birds and butterflies as biodiversity indicators

Birds and butterflies are considered to be excellent barometers of overall biodiversity and of the health of ecosystems, as they occur in many habitats and are sensitive to environmental change<sup>24</sup>. To gauge biodiversity, the Commission uses the EU Farmland Bird Index (FBI), which measures European farmland bird populations. While admitting this method has limitations, the Commission considers it the best available<sup>25</sup>. The FBI shows that populations have decreased by nearly 30 % since 1990 (see [Figure 3](#)). Currently, around 39 % of cropland bird populations are decreasing, 12 % of bird species are under threat and 20 % are near threatened, declining, or depleted<sup>26</sup>. Similarly, between 1990 and 2011, the grassland butterfly population fell by 50 %, indicating a considerable loss of grassland biodiversity<sup>27</sup>.

**Figure 3 – EU Common Birds – population index**



Source: European Environment Agency.

## Policy framework

The EU's strategic efforts to preserve biodiversity date back to its ratification of the UN's Convention on Biological Diversity (CBD) in 1993<sup>28</sup>. Each Member State is also individually party to the Treaty. Biodiversity concerns are also covered by the UN Sustainable Development Goals, notably Goal 15 of the 2030 Agenda for Sustainable Development, which are compatible with a number of the CBD "Aichi" biodiversity targets<sup>29</sup>.

In February 1998, to fulfil its obligations under the Convention, the European Commission adopted a Communication on a European Biodiversity Strategy<sup>30</sup>. In 2001, it adopted an EU Biodiversity Action Plan, in implementation of the Gothenburg Agenda on sustainable development<sup>31</sup>. Its aim was to halt the loss of biodiversity in the EU by 2010 and to take action to restore habitats and natural ecosystems; the plan was updated in 2006<sup>32</sup>. However, the action plan was largely unsuccessful, and its targets were not met<sup>33</sup>.

In 2011, the EU adopted its current biodiversity strategy<sup>34</sup>. The strategy's aim is to halt the loss of biodiversity and ecosystem services in the EU and help stop biodiversity loss by 2020. The strategy reflects the commitments undertaken by the EU in 2010, as part of the international Convention on Biological Diversity. It sets out six targets and 20 actions to halt the loss of biodiversity and ecosystem services in the EU by 2020.

Target 3 of the strategy is to increase the contribution of agriculture and forestry to maintaining and enhancing biodiversity. There are three corresponding actions:

- enhancing direct payments for environmental public goods in the EU common agricultural policy;
- better targeting Rural Development to biodiversity conservation; and
- conserving Europe's agricultural genetic diversity.

## EU funding and action

EU support for farmland biodiversity derives mainly from the 2014–2020 CAP, funded by the European Agricultural Guarantee Fund (EAGF)<sup>35</sup> and the European Agricultural Fund for Rural Development (EAFRD)<sup>36</sup>. The schemes most relevant to farmland biodiversity are:

- **Cross-compliance** – a mechanism that links direct payments to compliance by farmers with basic standards concerning the environment, food safety, animal and plant health and animal welfare<sup>37</sup>;
- **Greening** (funded from the EAGF) – direct payment rewarding farmers for fulfilling requirements, largely reflecting normal farming practices, beneficial for soil quality, carbon sequestration and biodiversity; and
- **Rural Development** (funded by the EAFRD) – rural development programmes across the Member States and the regions of the EU.

Rural Development Priority 4 is “Restoring, preserving and enhancing ecosystems”. Focus area 4a aims to restore, preserve and enhance biodiversity, including in Natura 2000 areas and areas facing natural or other specific constraints, as well as HNV farming and the condition of European landscapes. Two measures (agri-environment-climate (Measure 10) and aid for areas facing natural or other specific constraints (Measure 13)) together account for around 70 % of the budget share allocated to priority 4 in 2014-2020.

Agri-environment-climate measures in particular offer Member States a wide variety of opportunities to target aid at biodiversity, including on-farm conservation of genetic resources to preserve endangered breeds and crops under threat of genetic erosion.

### How much EU money is involved?

Tracking spending on biodiversity is complicated by the fact that EU money can target biodiversity both directly (e.g. through dedicated rural development measures) and indirectly (e.g. through greening). According to European Commission estimates, around €85 billion, or 8 % of the EU budget for 2014-2020, has been earmarked to tackle biodiversity loss (2019: €13.3 billion, 2018: €13.1 billion). Planned spending from the two CAP funds – the EAGF and the EAFRD – amounted to over €10 billion each year in 2018 and 2019 (see [Table 1](#)). However, in a study financed by the European

Commission, researchers expressed doubts about the biodiversity expenditure tracking mechanism<sup>38</sup>.

**Table 1 – Planned expenditure contributing to biodiversity**

*(EUR million, commitment appropriations)*

Heading	Fund	2017	2018	2019 (estimate)	Total 2014-2020
HEADING 1A: Competitiveness for growth and jobs	European Earth Observation Programme (Copernicus)	107,8	102,0	104,5	677,5
HEADING 1A: Competitiveness for growth and jobs	The Framework Programme for Research and Innovation (Horizon 2020)	159,6	434,1	612,1	2 771,6
<b>HEADING 1A: Competitiveness for growth and jobs</b>		<b>267,4</b>	<b>536,1</b>	<b>716,6</b>	<b>3 449,1</b>
HEADING 1B: Economic, social and territorial cohesion	European Regional Development Fund (ERDF)	878,4	903,5	930,6	5 987,6
HEADING 1B: Economic, social and territorial cohesion	Cohesion Fund (CF)	804,6	834,8	865,4	5 773,3
<b>HEADING 1B: Economic, social and territorial cohesion</b>		<b>1 683,0</b>	<b>1 738,3</b>	<b>1 796,0</b>	<b>11 760,9</b>
HEADING 2: Sustainable growth: natural resources	European Agriculture Guarantee Fund (EAGF)	5 795,0	5 856,0	5 838,0	36 220,0
HEADING 2: Sustainable growth: natural resources	European Agricultural Fund for Rural Development (EAFRD)	4 253,0	4 266,0	4 250,0	29 486,0
HEADING 2: Sustainable growth: natural resources	European Maritime and Fisheries Fund (EMFF)	134,0	136,7	138,0	943,0
HEADING 2: Sustainable growth: natural resources	Programme for the Environment and Climate Action (LIFE)	242,8	266,0	282,6	1 726,2
<b>HEADING 2: Sustainable growth: natural resources</b>		<b>10 424,8</b>	<b>10 524,7</b>	<b>10 508,6</b>	<b>68 375,2</b>
HEADING 4: Global Europe	Instrument for Pre-accession Assistance (IPA II)	15,0	12,3	12,4	64,3
HEADING 4: Global Europe	European Neighbourhood Instrument (ENI)	40,4	42,6	44,8	309,8
HEADING 4: Global Europe	Development Cooperation Instrument (DCI)	229,0	202,4	215,6	1 174,3
HEADING 4: Global Europe	Partnership Instrument for cooperation with third countries (PI)	9,5	17,7	10,2	61,9
<b>HEADING 4: Global Europe</b>		<b>293,9</b>	<b>275,0</b>	<b>283,0</b>	<b>1 610,3</b>
<b>Total Biodiversity</b>		<b>12 669,1</b>	<b>13 074,1</b>	<b>13 304,2</b>	<b>85 195,5</b>
<i>Biodiversity / EU budget</i>		<i>8,1 %</i>	<i>8,3 %</i>	<i>8,2 %</i>	<i>8,0 %</i>
<b>Total EU budget (Commission — Section III)</b>		<b>155 910,4</b>	<b>156 696,0</b>	<b>161 500,3</b>	<b>1 066 413,8</b>

Source: ECA, based on the Draft General Budget of the European Union for the financial year 2019.

## Roles and responsibilities

At the European Commission, agricultural biodiversity is mainly the policy domain of the following Directorates-General:

- the Directorate-General for Agriculture and Rural Development (DG AGRI); and
- the Directorate-General for Environment (DG ENV).

Another Directorate-General, the JRC, carries out research on biodiversity in farming, along with one of the EU's decentralised agencies, the European Environmental Agency (EEA). Finally, Eurostat (the Commission's Directorate for statistics) collects, compiles and publishes important data relating to agricultural biodiversity.

## Focus of the audit

The European Court of Auditors is carrying out an audit to assess whether the EU's agriculture policy has contributed to maintaining and enhancing biodiversity. In particular, we will examine whether:

- the EU biodiversity strategy and the CAP legal framework 2014-2020 were well-designed to increase farming's contribution to maintaining and enhancing biodiversity by 2020;
- in the period 2014-2020, the Commission and the Member States have increased farming's contribution to maintaining and enhancing biodiversity by 2020;
- the Commission used pertinent, reliable and up-to-date data and information to monitor and evaluate the contribution of farming to maintaining and enhancing biodiversity by 2020.

In the course of our audit, we will analyse key issues identified during the preparatory phase. Since these issues were identified before the audit work commenced, they should not be regarded as audit observations, conclusions or recommendations.

### **ABOUT ECA SPECIAL REPORTS AND AUDIT PREVIEWS**

The ECA's special reports set out the results of its audits of EU policies and programmes or management topics related to specific budgetary areas.

Audit previews provide information in relation to an ongoing audit task. They are based on preparatory work undertaken before the start of the audit and are intended as a source of information for those interested in the policy and/or programme being audited.

If you wish to contact the team in charge of this audit, please do so through the following e-mail address: [ECA-biodiversity-audit@eca.europa.eu](mailto:ECA-biodiversity-audit@eca.europa.eu).

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- <sup>1</sup> ECA, Special Report No 26/2016: Making cross-compliance more effective and achieving simplification remains challenging.
  - <sup>2</sup> ECA, Special Report No 01/2017: More efforts needed to implement the Natura 2000 network to its full potential.
  - <sup>3</sup> ECA, Special Report No 21/2017: Greening: a more complex income support scheme, not yet environmentally effective.
  - <sup>4</sup> ECA, Special Report No 03/2016: Combating eutrophication in the Baltic Sea: further and more effective action needed.
  - <sup>5</sup> GreenFacts, Biodiversity A Global Outlook, 2007, <https://www.greenfacts.org/en/global-biodiversity-outlook/>
  - <sup>6</sup> The World Economic Forum, The Global Risks Report 2019, 15 January 2019.
  - <sup>7</sup> Lamont Fedigan, "21st Century Homestead: Organic Farming", 2015, p. 25.
  - <sup>8</sup> BFN. Agricultural Biodiversity, <https://www.bfn.de/en/activities/agriculture/agricultural-biodiversity.html>
  - <sup>9</sup> Nigel Dudley & Sasha Alexander, 2017, Agriculture and biodiversity: a review, *Biodiversity*, 18:2-3, pp. 45-49, DOI: 10.1080/14888386.2017.1351892.
  - <sup>10</sup> Slingenber *et al.*; Study on understanding the causes of biodiversity loss and the policy assessment framework (financed by the European Commission - Directorate-General for Environment in the context of the Framework Contract No. DG ENV/G.1/FRA/2006/0073), 2009.
  - <sup>11</sup> EEA, High nature value farmland: Characteristics, trends and policy challenges, p. 5, 2004.
  - <sup>12</sup> EAA, SOER 2015 Briefing: Agriculture, 2015.
  - <sup>13</sup> Leip *et al.*, "Impacts of European livestock production: nitrogen, sulphur, phosphorus and greenhouse gas emissions, land-use, water eutrophication and biodiversity", *Environmental Research Letters*, 4 November 2015.
  - <sup>14</sup> UN FAO, "Livestock's long shadow: environmental issues and options", 2006.
  - <sup>15</sup> UN FAO, LIVESTOCK POLICY BRIEF 02, "Pollution from industrialized livestock production", Livestock Information, Sector Analysis and Policy Branch Animal Production and Health Division.
  - <sup>16</sup> Special Report No 03/2016: Combating eutrophication in the Baltic Sea: further and more effective action needed.
  - <sup>17</sup> Doxa, A., Bas, Y., Paracchini, M. L., Pointereau, P., Terres, J. and Jiguet, F., 2010, Low-intensity agriculture increases farmland bird abundances in France. *Journal of Applied Ecology*, 47: pp. 1348-1356. DOI: 10.1111/j.1365-2664.2010.01869.x.

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- <sup>18</sup> Paracchini *et al.*, “High Nature Value Farmland in Europe – An estimate of the distribution patterns on the basis of land cover and biodiversity data”, JRC Scientific and Technical Reports, 2008.
- <sup>19</sup> The Biodiversity Information System for Europe (BISE), Genetic resources, <https://biodiversity.europa.eu/topics/genetic-resources>
- <sup>20</sup> Report from the Commission to the European Parliament, the Council and the European Economic and Social Committee: Agricultural Genetic Resources – from conservation to sustainable use; Brussels, 28.11.2013; COM(2013) 838 final.
- <sup>21</sup> Report from the European Landowners’ Organization.
- <sup>22</sup> Joint Research Centre European Soil Data Centre (ESDAC), Soil Biodiversity, <https://esdac.jrc.ec.europa.eu/themes/soil-biodiversity>, 2 April 2019.
- <sup>23</sup> Joint Research Centre, Global soil biodiversity atlas, 1 April 2016.
- <sup>24</sup> European Environment Agency, “Abundance and distribution of selected species (CSI050/SEBI 001)”, European Environment Agency (<https://www.eea.europa.eu/data-and-maps/indicators/abundance-and-distribution-of-selected-species-7/assessment>), 2018.
- <sup>25</sup> European Commission, Directorate-General for Agriculture and Rural Development, Annual Activity Report 2017, Ares(2018)2205365, 25 April 2018.
- <sup>26</sup> European Environment Agency, “Mapping and assessing the condition of Europe’s ecosystems: progress and challenges and EEA contribution to the implementation of the EU Biodiversity Strategy to 2020”, p. 66, 2016.
- <sup>27</sup> *Ibidem*, p. 81, 2016.
- <sup>28</sup> United Nations, Convention on biological diversity, 1992.
- <sup>29</sup> The Strategic Plan for Biodiversity 2011-2020 and its Aichi Biodiversity Targets adopted under the Convention on Biological Diversity has been recognised as setting the global framework for priority actions on biodiversity.
- <sup>30</sup> Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions; Our life insurance, our natural capital: an EU biodiversity strategy to 2020, COM/2011/0244 final.
- <sup>31</sup> Commission Communication of 27 March 2001 to the Council and the European Parliament: Biodiversity Action Plan for Agriculture (Volume III), COM(2001) 162 final.
- <sup>32</sup> Commission staff working document – Annexes to the Communication from the Commission – Halting the loss of biodiversity by 2010 – and beyond – Sustaining ecosystem services for human well-being, COM(2006)216 final.
- <sup>33</sup> EU Biodiversity Action Plan Report 2010; see [http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap\\_2010.htm](http://ec.europa.eu/environment/nature/biodiversity/comm2006/bap_2010.htm).
- <sup>34</sup> The European Commission, EU biodiversity strategy to 2020, 2011.

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- <sup>35</sup> Mainly governed by Regulation (EU) No 1306/2013 on the financing, management and monitoring of the common agricultural policy and Regulation (EU) No 1307/2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy.
- <sup>36</sup> Mainly governed by Regulation (EU) No 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD).
- <sup>37</sup> Council Regulation (EC) No 73/2009 of 19 January 2009 establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers, amending Regulations (EC) No 1290/2005, (EC) No 247/2006, (EC) No 378/2007 and repealing Regulation (EC) No 1782/2003.
- <sup>38</sup> Ernst&Young; Study on biodiversity financing and tracking biodiversity-related expenditures in the EU budget; Project number: ENV.B.2/ETU/2014/0031; Final Report June 2017.

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