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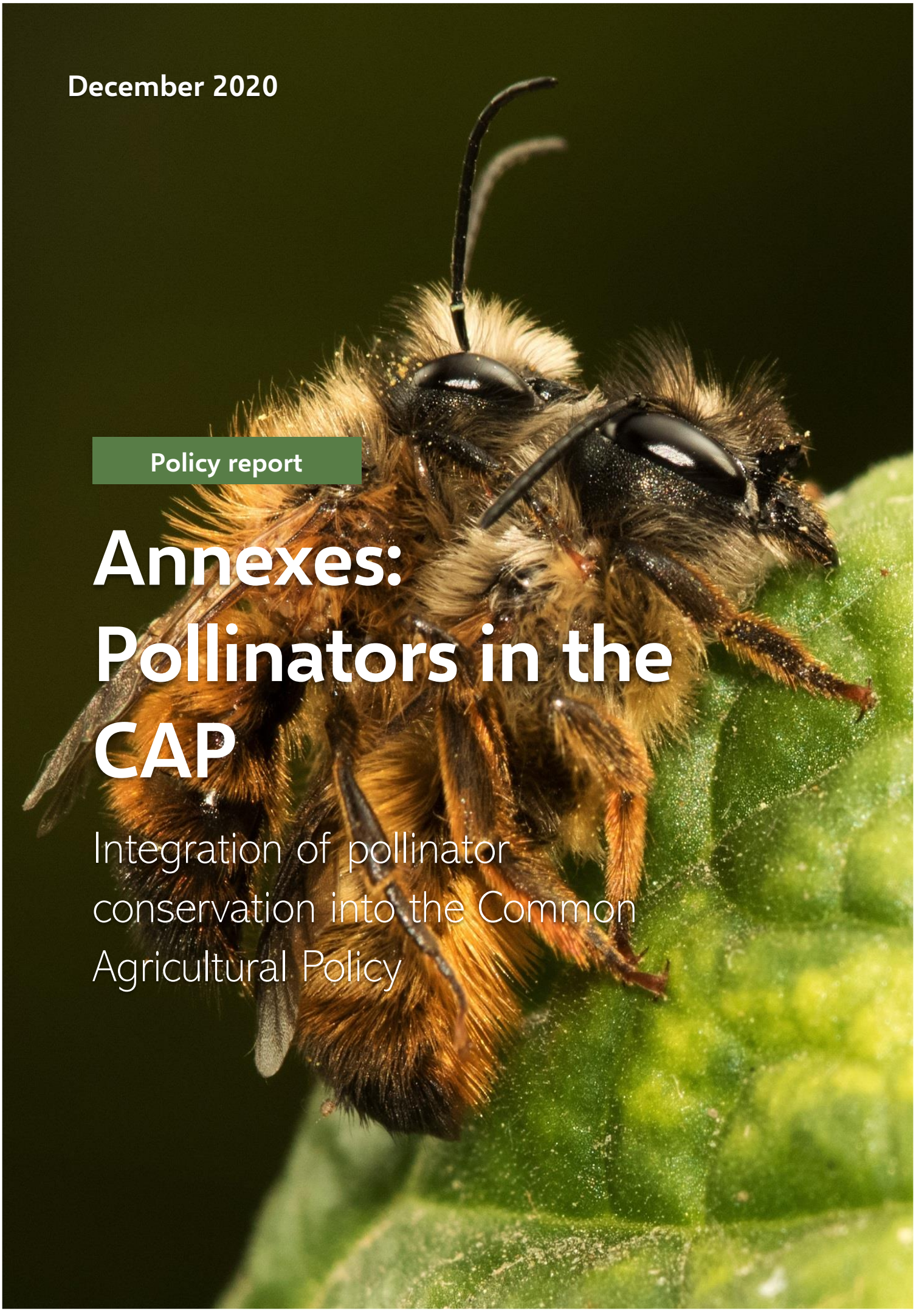

Policy report

Annexes: Pollinators in the CAP

Integration of pollinator conservation into the Common Agricultural Policy

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1. ANNEX 1: ADDITIONAL INFORMATION

1.1 How can the effectiveness of Ecological Focus Areas be improved for pollinators?

Source: summarised extracts from (Cole et al, 2020).

EFA option and uptake (selected options only)	Standard management requirements	Potential to improve pollinator friendly management
Catch crops/ Green cover (51% of EFA area in 2018 – before weighting)	Catch crop sown after the main crop. Under-sowing grass in the main crop. Catch crop should be established for a minimum period and sowing dates are specified by country. Catch crops are typically in situ during winter and ploughed into the soil in spring. Mixtures with specified plant species and seed density are defined by some countries.	The following management options are more pertinent to South Europe where flowering can occur prior to spring ploughing: • Allow plants to flower (e.g. delay ploughing so catch crop can provide early season resources). • Use nectar and pollen-rich species (e.g. clover, *Phacelia*) and include more than one species to increase continuity/diversity of floral resources. • Avoid using insecticide seed coating and plant protection products during the catch crop presence in the field. • Avoid putting flowering catch crops in after a neonicotinoid treated crop.
Nitrogen-fixing crops (24% of EFA area in 2017 – before weighting)	Minimum area in some countries.	• Use nectar and pollen-rich species (e.g. lupins, clover)

	Crop has to be present for a certain amount of time in some countries. Specific choices of species (differs greatly across countries).	• Include more than one species to increase continuity/ diversity of floral resources. • Restrict agro-chemical inputs. Use Integrated Pest Management. • Avoid planting flowering crops following crops receiving systemic pesticides. • Allow plants to flower.
Land lying fallow (21% of EFA area in 2018 – before weighting. NB melliferous fallow is only a small proportion of this area, mostly in Germany and France.)	No cultivation of crops during a minimum period (e.g. during the first half of the year), but generally no specifications about no. of years/cultivation cycles Land must be "kept in good condition": mowing, grazing, mechanical or chemical weed control, fertilizer application may therefore be, under restrictions, allowed in some countries, while not allowed in others; also variable prescriptions regarding timing of management (e.g. cutting) and removal of biomass.	Retain fallow for more than one year to encourage both annual and perennial forbs. Consider allowing longer term succession in which woody species are allowed to grow. • Introduce low level disturbance (e.g. via restricted grazing or mowing) to encourage floristic diversity. Frequency dependent on Member State and site conditions. • Maintain patches of bare ground and a balance of annual and perennial plant species. • Stagger mowing to create a diversity of successional stages and/or to avoid seasonal gaps in floral resources. • Avoid pesticide/fertilizer use.

		• If invasive plants/injurious weeds must be controlled, use only targeted mechanical or spot treatments. • Spatially target botanically diverse locations (e.g. areas of previous low intensity management). • If naturally regenerated vegetation provides poor floral resources for pollinators encourage botanical diversity via sowing of wildflower mixtures. Select resource-rich species with diverse characteristics (e.g. flower shape, flowering period)
Landscape features (5% of EFA area in 2018 – before weighting – mostly hedges and trees in a line, followed by ditches and trees in a group)		
Hedges (MS with highest proportion of EFA area as hedges and trees in line - UK, France, Germany)	Maximum width in some countries (up to 10m in Estonia and Hungary). Vegetation should be bushes and trees (Estonia) or woody material (UK-NI and HU) Cross compliance rules also apply which include not cutting between 1 March and 31 August, although there are exemptions.	Select nectar and pollen-rich (non-toxic) woody species with diverse characteristics (e.g. flower shape, flowering period). • Maintain a vegetated buffer (minimum width 2 m) adjacent to feature where ploughing and use of agro-chemicals is not permitted. • Hedge cutting interval should allow shrubs/plants to flower

		(i.e. at least two years between cuts) and cutting should be staggered within a farm to ensure some hedgerows flower every year. • Protect from field management practices to avoid damage (e.g. compaction, spray drift, ploughing). • If invasive plants/injurious weeds must be controlled, use only targeted mechanical or spot treatments.
Trees in line (MS with highest proportion of EFA area as hedges and trees in line - UK, France, Germany)	Perished trees must be replaced. Minimum crown diameter of 4m, minimum separation of tree crowns 5m, minimum length of the line of trees 20-25m and minimum area 0.1 ha (based on crown diameter). Management of cutting regime, such as pruning, during dormancy applied to no more than a third of the total area. No pesticide or fertiliser applied within 3 m radius of the trees.	Select nectar and pollen-rich (non-toxic) woody species with diverse characteristics (e.g. flower shape, flowering period). • Introduce low level disturbance (e.g. via restricted grazing or mowing) to encourage floristic diversity. Frequency dependent on Member State and site conditions. • Do not remove dead wood, stones. • Maintain patches of bare ground and a balance of annual and perennial plant species. • If invasive plants/injurious weeds must be controlled, use only targeted mechanical or spot treatments.

		• Maintain a vegetated buffer (minimum width 3 m) adjacent to feature where ploughing and use of agro-chemicals is not permitted. • Ensure aspects that provide favourable conditions for pollinators are protected from field management practices (i.e. south facing for sun and warmth in northern countries and north facing for shade in southern countries)

1.2 What evidence is there that honeybees have negative effects on wild pollinators?

Honeybees could have negative effects on wild pollinators by competing with them for nectar and pollen resources, or by transmitting diseases and parasites to wild pollinators.

Honeybees and wild bees share a number of parasites and pathogens. The literature suggests that honeybees can transmit pathogens to wild bees (Fürst et al, 2014), and that these pathogens may be contributing to wild bee population declines (Graystock et al, 2016; Mallinger, Gaines-Day and Gratton, 2017). However, there are very few studies that test pathogen transmission from honeybees to wild bees, as most studies only show correlations between pathogen presence in wild and domesticated bees, or do not examine the direction of transmission (Mallinger, Gaines-Day and Gratton, 2017).

Several systematic reviews of studies of competition between honeybees and wild pollinators have concluded that the few studies that measured impacts on reproduction and population growth mostly demonstrated negative effects on wild pollinators, mainly on bumblebees but also on solitary bees (Mallinger, Gaines-Day and Gratton, 2017; Wojcik et al, 2018). However, most of the published competition studies only measured abundance and foraging behaviour and found mixed effects or no effects. This is because most bees are generalists and are

capable of adapting their foraging behaviour in response to competition, for example by foraging on less rewarding plant species or by foraging in different resource patches to honeybees, which concentrate their efforts on the most highly nectar rich flower patches.

A study in oilseed rape fields found that the addition of honeybee hives depresses the densities of other insects visiting rape flowers (bumblebees, solitary bees, hoverflies, marchflies, other flies, and other flying and flower-visiting insects) (Lindström et al, 2016).

Competition between honeybees and wild bees will vary according to the abundance of flower resources within the foraging range of the honeybees, i.e. in a radius of 1 km from the hive (Elbgami et al, 2014). A study in Sweden found that in arable landscapes with a low cover of semi-natural vegetation (i.e. less than 2% cover, mainly in field edges and road verges), the presence of honeybees reduced bumblebee densities, but no effect was observed in landscapes with at least 4% cover of semi-natural grasslands (Herbertsson et al, 2016).

The placing of honeybee hives in protected areas with semi-natural vegetation and rare wild pollinator populations could result in conflicts with nature conservation priorities if the honeybees are outcompeting the wild pollinators and depressing their population growth. (Cane and Tepedino, 2017) estimate that a strong honeybee colony gathers as much pollen in a month as a relatively large sized solitary bee species could use to produce 33,000 progeny. A way to measure the possibility of competition is to measure relative bee abundances (honeybees versus wild bees) at increasing distances from the hives. A study in a heathland protected area found fewer stem-nesting bee species near honeybee hives compared with similar areas without hives (Hudewenz and Klein, 2013). A study in a Mediterranean scrubland protected area found that at a density of 3.5 hives per ha, the wild bee biomass around hives was lower than in scrubland without bee hives, due to the absence of the large wild bee species (Torné-Noguera et al, 2016). A broad scale data review concluded that in the Mediterranean region, there is evidence of a long term trend of honeybees replacing wild pollinators on both crop flowers and wild flowers, with four times fewer wild pollinators visiting flowers than honeybees, compared to the ratio in the 1960s (Herrera, 2020).

Honeybees could also change the composition of vegetation by pollinating certain plants more heavily (which then produce more seed). There is little evidence that honeybees change wild plant communities in ways that endanger sensitive species. Some studies have shown that the presence of honeybees has positive effects on native plant communities, indicating that in some contexts, honeybees may aid in restoration or conservation efforts (Mallinger, Gaines-Day and Gratton, 2017).

The possibility of competition can be reduced by limiting the number of hives in relation to the abundance of flowering resources, and also by managing the spacing of hives.

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2. ANNEX 2: CASE STUDIES

2.1 Austria

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Completed: 28 June 2019

NB The annexes of this case study are available on demand from IEEP.

Part 1: How pollinator considerations played a part in Austria's CAP implementation decisions

Lessons learned from CAP implementation 2014-2020

Prioritizing objectives

The approach to defining and prioritizing the objectives of measures should be further improved. Of course the SWOT, which has to be made in the course of the preparation of the RDP, has been used for this purpose, but in the end, many decisions have been made on the basis of expert knowledge in the working groups and on the basis of political framework conditions. Some measures and criteria have also been changed in the direct (political) negotiations with the Commission and scientific findings or evaluation results no longer played a role. In most cases, no stakeholders were consulted at this stage of the negotiations.

Currently, biodiversity targets focus primarily on animals and especially on birds and pollinating insects. It is necessary to clarify whether this is enough and whether, for example, other insect or plant species should be increasingly considered.

Example: Cultivation and design of flowering areas. When such measures are conceived, it is necessary to define clearly beforehand which species should benefit from them. Pollinators have different requirements than specific bird species.

Table 1: CAP measures which can affect wild pollinator habitats

CAP measure	Programming decisions	Relevant factors
Farm Advisory Service, RDP support for advice and training (M1 / M2)	*Whether to offer advice or training through FAS, M1 or M2 on:* *how to manage species rich grassland so as to encourage pollinators* *the creation and management of pollinator borders, in field strips or buffer strips so as to encourage pollinators* *creation and management of pollinator-friendly arable fallow* *pollinator-friendly creation and management of*	Wild pollinators were not specifically considered, when the measures M1/M2 were developed. A reason for this was that the measures M1 and M2 and also other RD-measures (e.g. 7.6.1, 16.5.2b) in Austria were designed very open with few specifications concerning advice topics. Instead of providing detailed specifications for topics, the funding agencies (Federal Ministry for Sustainability and Tourism or Federal States) open calls every few months and qualified applicants can apply for funding with their projects (see Annex I: Sonderrichtlinie Projektförderungen, pages 42ff). Example for a call concerning M1, see footnote[1] All funded projects are collected in a database, managed by Agrarmarkt Austria, the Austrian Paying Agency for Agriculture and Rural Development. Project examples which consider creation or management of pollinator habitats were requested, no data were received yet (by 11/6/19). A project example which considers advice and training concerning creation or management of pollinator habitats and which was funded under M1 or M2: "LandwirtInnen beobachten Pflanzen und Tiere" ("Biodiversity monitoring – Farmers take care of plant and animal species in their meadows"): http://www.biodiversitaetsmonitoring.at The project started in 2008 (still running). Farmers are trained in monitoring specific grassland plants and animals. Ecological experts visit the farmers, define the monitoring species and train the farmers. It is a project for awareness raising about the needs of the species of extensive meadows.

[1] https://www.bmnt.gv.at/land/laendl_entwicklung/foerderinfo/veroeffentlichung_stichtag_aufrufe1/Bekanntmachung-3.-Stichtag-f-r-das-Auswahlverfahren-in-der-Ma-nahme-1.html, 11.6.2019

	hedges, trees and wood patches *the management of heath and scrubland to promote pollinators* *ways to manage forest land to promote pollinators*	Farm Advisory Service: Is only a small measure in Austria, which is done by the Austrian Chamber of Agriculture (LKÖ) in cooperation with rural training institute (LFI). Advice is mainly offered for agricultural topics; biodiversity is only a side note. There is no official information available why pollinators were not considered.
Agri-Environment Climate Measure (AECM) and linked non-productive investments (M4.4) (eg for habitat creation and restoration)	*Whether to offer AECM support for biodiversity-friendly grassland management practices & whether management requirements consider pollinator relevance*	Agri-environment-climate scheme „Environmentally sound and biodiversity-promoting management" (UBB) funds the obligatory creation of biodiversity areas on at least 5% of the farm area on grassland and/or arable land. Requirements on grassland: • First cut at the same time as the second cut of comparable areas (at the earliest as of the 1st of June) • No grazing before first cut • The cut grass has to be removed from the area • No pesticide uses on the whole area • No fertiliser uses before fist cut (see Annex II: ÖPUL SRL, pages 34ff) Pollinators were a topic during conception of UBB. The biodiversity areas aren't aimed exclusively at pollinators and were developed for other species (e.g. birds). When developing the measure, different stakeholder (e.g. farmers, ecologists, hunters, bee keeper) were included. This caused some difficulties as every stakeholder had different preferences for the biodiversity areas (about the

		species that should be addressed, where the areas should be located etc.). Not all interests could be considered, as the different species have different requirements. Some bird species need differently managed biodiversity areas than pollinators, which may have different requirements than other insects. During development of UBB it was also discussed to demand that farmers have to establish biodiversity strips on every parcel. But this was not tolerated by the Chamber of Agriculture and probably would have affected the acceptance of the measure negatively, because it would have been very difficult for farmers to manage. Subsequently the stakeholder and the Ministry agreed on 5 %. Pollinators (or rather insects as a whole group) were also considered during the revision of the nature conservation measure (see Annex II: ÖPUL SRL, pages 64ff). Requirements that are aiming on the protection of insects are "No mowing of 5-10 % of the parcel (includes no pesticide and fertilizer use)", "Leave non-mowed strip over the winter until the first cut", "Leave non-mowed strip over the winter until the second cut" (see Annex III: ÖPUL SRL, Anhänge, pages 105f). The first requirement existed already in RDP07-13, the latter two were suggested by ecologists and were included newly in the RDP14-20.
	Whether to offer AECM funding for the creation of pollinator borders or strips on arable land	Measure UBB is also offered for arable land (see above). Requirements on arable land: • sowing seed mixtures of at least 4 insect-pollinated plant species until the 15th of May at the latest (this is important for pollinators as the plants should not flower too late in the year) • kept for at least 1.5 years on the same area • no fertiliser or pesticide use and

		• mown/chopped once annually, maximally two times per year. On 50 % of the biodiversity area mowing at the earliest of 01.08., on the other 50 % no restrictions concerning mowing date. No grazing or harvesting of seeds. • Only mechanical removal of the biodiversity area allowed (chopping or ploughing). Optional measure: Cultivating of flowering crops Area year 2018: 8000 ha (summer poppy: 1.790 ha, Linum (for oil production): 1.030 ha, cumin: 1.120 ha, lentils: 863 ha, milk thistle: 1.209 ha; for detailed information about crops and areas see Annex XIII). Areas have increased slightly since 2015. The measure was developed to promote insects and to support alternative, arduous crops in the sense of a more diverse crop rotation. The idea behind the measure was the promotion of insects, although some of these crops can only be cultivated with the help of insecticides.
	Whether to offer AECM support for Integrated Pest Management and reduced pesticide use	The following measures of the Austrian Agri-environmental program support integrated pest management (see Annex II: ÖPUL-SRL): • Restriction of yield-enhancing equipment (measure 2) Compulsory combination with UBB • No use of plant protection products in wine and hops (measure 11) • Use of beneficial organisms in protected cultivation (measure 13)
	Whether to support the creation, restoration and biodiversity-friendly	Measure UBB: Preservation and environmentally friendly handling of landscape elements (LSE)

	management of hedges, trees and wood patches through the AECM.	a. Obligation to preserve LSE and handle them environmentally friendly in accordance with annex E (see Annex III, Anhänge zur ÖPUL-SRL, page 7). Affected are landscape elements, which are located on or maximal 5 meters next to agricultural areas and are in the control of the farm. b. Only landscape elements which are not designated as CC elements in accordance with Section 15 of the horizontal CAP Regulation are eligible. c. Excluded from the conservation obligation are landscape elements on alpine pastures and extensive pastures (Hutweiden). In order to implement and control this measure and in order to distinguish between UBB landscape elements and CC landscape elements, all landscape elements were digitally registered. When farmers got to know about this plan, many landscape elements were removed, because farmers didn't want to lose control. They thought if the LSE have been registered, they would have no possibilities to remove them if necessary. This decision was often made on "gut feelings" not by logic. The digitisation should have been communicated much better with farmers. Non-productive investments: Measure 7.6.3 Funding of traditional orchards (Streuobst). Is handled by Federal Governments. Is relevant for pollinators.
	Whether to offer AECM for the creation and maintenance of wildlife fallow, e.g. through natural regeneration over a year or more or with wild seed mixes for pollinators.	Has been considered in the greening variant 1 (measure 6 of the Austrian Agri-environmental Programme, see Annex II: ÖPUL SRL, page 44), where a flowering seed mixture (bee mixture) is promoted. Currently implemented on 4000 ha. The idea was to do something for flower-visiting insects, mainly honey bees. When the ministry developed the measure, they discussed it with beekeepers. They indicated that bees need early flowering mixtures, not late flowering mixtures. The normal greening is too late, as the bees should go into hibernation when they bloom. The honeybee has a lobby, wild bees not really. A difficulty in developing measures for wild bees is that they have very specific, individual requirements. For example, a flowering rapeseed field is uninteresting for some wild bees.

	Whether to program AECM for restoration and maintenance of grazed heath and scrub habitats.	Nature conservation measure Specific requirements for grazed scrub habitats (see Annex III: Anhänge zur ÖPUL-SRL, pages 116ff). Grazed scrub habitats (Hutweiden) get same funding as all other types of grassland in ÖPUL. Non-productive investments 7.6.3 for revitalization of alpine pastures Is handled by the federal states.
Organic farming support	*Whether pollinator conservation is mentioned as a reason for supporting organic farming.*	UBB is not compulsory for organic farmers, which was unfavorable to uptake. The organic farming lobby was so strong that they could get this through. The argument was that they do so much for biodiversity anyway that they do not need the UBB restrictions. In the future CAP negotiations, it is easier to call for measures for organic farmers, because there are some evaluation results that clearly show that organic farmers are not greener per se. Evaluations show that a UBB farmer with 5% diversity areas can be more insect-friendly than an organic farmer that has no diversity areas. Although organic farmers use little to no plant protection products, the arable land is often harrowed, and grassland is mowed (too) early. Especially in grassland, it makes no difference to biodiversity whether a farm is organic or conventional. What matters is the intensity of the management. The difference between an (intensive) dairy cow farm and an (extensive) suckler cow farm is much greater than between a conventional dairy cow farm and an organic dairy cow farm.
Other RDP measures	*Whether to programme the RDP measures for agroforestry forest conservation, and environmental afforestation*	Restoration of coppicing management and/or pollarding.

	Whether to offer forest restoration support for the conversion of closed coniferous stands to open mixed deciduous forest.	The design of the Austrian woodland environmental program (Waldumweltprogramm, ÖWÖP) was discussed in a very broad stakeholder process. 12 workshops were done between 2011 and 2013. Pollinators were not a main topic but were also a part of the discussion.[2] Strategy paper plus annex: see Annex IV and V Implementation of ÖWÖP is poor, there is only little participation by foresters. The foresters have criticised that the regulation is not suitable (framework conditions, premium levels, time limits, control requirements, content specifications etc.). One could assume that the reflex is even more pronounced in forestry than in agriculture, to say, 'We are already sustainable, there is no need for further action'. One difficulty is to compensate measures. For example, if you leave a deadwood tree standing, the tree must be located (mapped), although you get little money for it. At the same time, there is a risk that bark beetles could spread and cause massive damage. Acceptance of such measures is therefore low among many foresters.
GAEC rules	*Whether to protect buffer strips through cross-compliance by listing them under GAEC 7 (beyond what is legally required by Water Framework Directive rules and/or nitrate action plan rules).*	Cross compliance: protection of water against contamination by nitrate In the case of buffer strips, the focus was on the nitrate action program and the protection of water from the input of phosphorus and nitrogen, rather than the promotion of insects. There can be positive synergies for pollinators if buffer strips are designed in such a way that they can also be used by insects. But pollinators were not the main goal. For example, at sites where groundwater input is concerned, one does not want to use legumes, so that they do not produce nitrogen, which can then enter the groundwater. Therefore, very grassy stocks are desirable for buffer strips, which are not attractive for flower-visiting insects. In this case, objectives must be prioritized.

[2] https://www.himmel.at/kuratorium-wald/projekte/owop/, 11.6.2019

	Whether to protect hedges, trees and tree patches from destruction by listing them as landscape features under cross-compliance GAEC 7, and whether any additional conditions are defined that might benefit pollinators.	GLÖZ 7: CONSERVATION OF PROTECTED LANDSCAPE ELEMENTS • Stone bars/stone walls/trenches/shore edge strips or ponds • Natural monuments must not be eliminated. Hedges and trees must not be cut during breeding and nesting periods. This provision applies to GAEC landscape elements and natural monuments between 20 February and 31 August. Cross compliance: Plant protection products Plant protection products must be used properly in accordance with Directive 2009/128/EC for the sustainable use of pesticides and in accordance with Regulation (EC) No 1107/2009 on the placing on the market of plant protection products.
Greening: permanent grassland rules	*Whether to protect permanent grassland from ploughing completely by designating it as ESPG*	MS may have intended the ploughing ban as a means of preventing the intensification of grassland management with potential loss of pollinators. Designated as ESPG are the following habitats within Natura 2000: 1530 (Pannonian steppes and salt marshes), 2340 (Pannonian inland dunes), 5130 (formations of Juniperus communis on limestone heaths and lawns), 6130 (heavy metal lawn), 6170 (alpine and subalpine limestone grass), 6210 (scarcity stages -Festuco-Brometalia), 6230 (species-rich montane bristle grass on silicate soils), 6240 (subpannonian steppe dry grass), 6250 (subpannonian steppe dry grass on loess), 6260 (pannonian steppes on sand), 6410 (pipe grass meadows), 6440 (Molinia-floodplains), 6510 (lean lowland mowing meadows), 6520 (mountain mowing meadows), 7230 (calcareous low bogs).
Ecological Focus Areas	*Was the pesticide ban on nitrogen-fixing crops communicated as being*	According to Lukas Weber (BMNT), there were no national negotiations concerning the 1st pillar, and at EU level, pollinators have played no role in the design of greening rules. However, authorities amended some EFA regula-

	good for pollinators and were pollinator-friendly N-fixing crops included? *Whether to allow hedge, tree and tree patch landscape features to count towards the greening EFA requirements.* *Whether to allow fallow with naturally developed vegetation to count towards the greening EFA requirements* *Whether to allow forest edges, short rotation coppice, agroforestry and environmental afforestation to count towards the greening EFA requirements.*	tions due to public discussions about bees. In 2017, there were changes in the ecological focus areas, which specifically relate to wild pollinating insects: allow bee-friendly fallow seed mixtures (Bienentrachtbrache) to count towards the EFA requirements, prohibition of pesticide use in nitrogen-binding plants. Originally, 7% biodiversity areas were planned for the first pillar. This was reduced to 5% in the course of the negotiations. The Commission's original proposal was relatively simple: 5% fallow land. The Member States then made numerous extra demands: inclusion of short-rotation areas, protein crops etc. This creates complicated requirements and ultimately lower gains for biodiversity. Austria: Since 2015, farms with more than 15 hectares of arable land must have five percent ecological focus areas (ÖVF) on arable land. Areas that count towards EFA requirements • fallow land, • within the framework of Cross Compliance protected landscape elements (Stone bars/stone walls/trenches/shore edge strips or ponds, natural monuments), • areas with nitrogen-binding plants • intermediate crops • areas with low forest with short rotation (allowed tree species: Weide (*Salix* sp.), Pappel (*Populus* sp.), Grauerle (*Alnus incana*), Schwarzerle (*Alnus glutinosa*), Esche (*Fraxinus*) and Birke (*Betula* sp.)). • Since the application year 2018, additional fallow areas (with pollen- and nectar-rich species) and • areas with Miscanthus

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since 2019 areas with silphium perfoliatum (mixed silphie).

Equivalent EFA are biodiversity-areas in the UBB measure (DIV).

Some areas are weighted differently.

<table>
<tr><th>EFA</th><th>Factor</th></tr>
<tr><td>fallow land</td><td>1,0</td></tr>
<tr><td>within the framework of Cross Compliance protected landscape elements</td><td>1,0</td></tr>
<tr><td>nitrogen-binding plants</td><td>1,0</td></tr>
<tr><td>intermediate crops</td><td>0,3</td></tr>
<tr><td>low forest with short rotation</td><td>0,5</td></tr>
<tr><td>fallow areas with pollen- and nectar-rich species</td><td>1,5</td></tr>
<tr><td>Miscanthus</td><td>0,7</td></tr>
<tr><td>silphium perfoliatum (mixed silphie).</td><td>0,7</td></tr>
</table>
See Annex VI: Ama-Merkblatt-Greening, pages 5ff.
</td>
</tr>
<tr>
<td>Pillar 1 eligibility rules</td>
<td>Whether the Member State has chosen to extend its definition of "permanent grassland" to include other land on which</td>
<td>Traditionally grazed grassland in Austria is not endangered by ploughing, because the yield would be much too low. It is more endangered by fallowing. There is no need to include traditionally grazed grassland in the definition of permanent grassland, it is much more important that farmers get enough funding for the cultivation of these areas and that products that are produced on these areas sell at a fair price.</td>
</tr>
</table>

	traditional grazing practices take place. *Whether the MS has chosen to protect grassland from ploughing without re-seeding, and from conversion to arable, by defining "permanent grassland" to include traditionally grazed areas.* *Whether to define the eligibility rules for wooded agricultural land to help support the viability of wood pasture farming systems*	Concerning rules for eligibility as agricultural area see Part 3.
Other measures with consideration of pollinators (projects)		**Measure 7.6.1:** This is an important measure in Austria concerning biodiversity projects (M7: about 204 Mio. Euro were spent between 2015-2017; M7.6: about 68,4 Mio. Euro). M7.6.1 is specifically designed for studies and projects concerning biodiversity, nature conservation and protected species. It is a main funding source in Austria, when e.g. non-profit organisations want to implement nature conservation projects. Project example: Ordentlich.Schlampert! www.ordentlich-schlampert.at Biologically diverse areas such as late-mown meadows simply appear shabby. The grass is tall, brown and partially broken. This is not something commonly seen in the Austrian landscape. For this reason, farmers who create such

		strips of biodiversity not only have to work against their own sentiments, they are also subject to the critical assessment of their communities. In this project we employ different methods to make the images about landscapes we have in our heads visible. We encourage farmers and the local population to question their own notions of landscapes with a touch of humour, and to become more open to ecological approaches. To achieve this, we organize seminars with live illustrations, comic workshops for schools, a travelling exhibition and some special surprises for the farmers (http://www.suske.at/en/projects/all-projects/properly-shabby). So far, the calls of measure 7.6.1 have been rather open, not specific to the subject. There were priority lists, but these were very comprehensive. But the previous call in measure 7.6.1 was specially designed for insects: According to the goals of the Special Directive for Projects the following priorities were defined for the call with ending date 15th of Mai 2019: Measure 7.6.1 a – nature conservation: Projects, actions and public relations on the topic of insect diversity, in particular: • Development of basics and measures for improved survival possibilities of insects. • Preparation, implementation and monitoring of area measures for the promotion of insects, especially in the fields of agriculture, forestry, municipalities, industry and trade as well as in the private sector such as residential construction and gardening. • Public relations and education to raise awareness of the importance of insects in ecosystems and the economic importance of insects with the aim of creating initiatives to promote different insect species (see Annex VIII: description of call). List of calls, see https://www.bmnt.gv.at/land/laendl_entwicklung/foerderinfo/veroeffentlichung_stichtag_aufrufe1.html

		Other projects funded by Austrian RDP and consider pollinators: Leader-Projects: "Blühendes und Summendes Wipptal" („Flowering and summing Wipptal") https://www.zukunftsraumland.at/projekte/1645 Measure 16.5.2b: Project "Insekten-Leben": Insect diversity and populations have been declining for decades. This project with its 25 partners aims to find new ideas and activities to halt this decline. The 5 project regions will receive a broad information basis about insects. This will motivate the public to create suitable insect habitats (http://www.suske.at/en/projects/all-projects/groes-insektenprojekt-gestartet).

Advantage of open calls

The design of measures 1 and 2, as well as measure 7.6.1 and 16.5.2b, is kept very open in Austria. Instead of providing detailed specifications for topics, the funding agencies (Federal Ministry for Sustainability and Tourism or Federal States) open calls every few months and qualified applicants can apply for funding with their projects. Very few member states do this. The advantage of open calls is that many different projects can be (and have been) implemented and the know-how of the project advertisers can be fully utilized. Where appropriate, the funding agencies may respond to specific circumstances and make thematic calls, as was the case with the last call in measure 7.6.1. (see table above).

Regional programmes vs. horizontal measures

Member states should consider how much the program is more flexible or regionalized. There is no such thing as THE measure to help all pollinators throughout Austria. Authorities must investigate, where broad measures and where specific measures (either regionalized or special horizontal nature conservation measures) have more benefits. Concerning arable land for example there are evaluations which show that it would be better to have more fallow areas and not just a few areas, where the management is specified down to the smallest detail. For example, the target could be that 50,000 farmers set aside 10% of their land but must meet only few requirements. Then the probability is high that they won't all do the same thing. Some farmers will chop their land in April, others not at all, mowing and removing the cuttings, and a third group may chop their fallows in October. This would result in a mosaic of different fallows. If we tried to prescribe this, it would be complicated, and farmers would not apply.

Landscape elements

If authorities plan to digitally map landscape elements, the purpose of this must be communicated very clearly to farmers. This did not happen enough in Austria in the last years, which resulted in the removal of many landscape elements because farmers did not want to lose control or felt restricted too much.

Result-based payments

Restrictions concerning late mowing dates will become more difficult to implement because of changing climate conditions. Vegetation starts growing earlier than before, and farmers are not willing to mow their meadows later. The implementation of result-based payments could be an answer to this problem. In result-based concepts farmers do not have to comply with a fixed cutting date, but are guided by specific conservation objectives, such as mowing when a plant species has flowered. This allows them to react flexibly to weather conditions.

Maintaining continuity

It is not a place to reinvent the entire program, but to improve existing measures and focus them more on pollinators. In doing so, care should be taken not to get into conflicts of goals. Even if measures are targeted more specifically at pollinators, it is necessary to monitor the overall effect.

Different consideration/inclusion of organic farmers

Organic farmers should not be excluded from pollinator-friendly measures just because they are organic farmers.

Awareness-raising and information

Raising farmers' awareness and providing information about the importance of ecological measures must be further increased. Especially regarding flower strips, there is still a great need for awareness-raising. Many farmers have prejudices that flower strips look messy.

Part 2: Advice made available to land managers to help them encourage pollinators

Agri-environmental-measure UBB:

All farmers in this scheme must attend training on environmental priorities including biodiversity (about 50,000 farmers = nearly half of all farmers registered in the Land Parcel Identification System in Austria). Insects are also considered in the course of the UBB training.

The training was done by the LFI (rural training institute) in cooperation with the agricultural chamber. The training was differently organised in the different federal states. The topic of biodiversity was conveyed to varying degrees and quality. Some federal states organised many small seminars with only a few attendants, others had few courses with several hundred attendants. There were also online-courses. In some federal states the LFI hired external experts (e.g. ecologists) to deliver the biodiversity topics (for example in Styria). Unfortunately, there are no standardized figures about how many courses have been held and how much focus was on biodiversity topics. But according to Lukas Weber, for the first time the topic of biodiversity was included almost everywhere in farm advisory. The reason for the successful implementation was that an educational concept was prepared in advance on behalf of the LFI. Positive for the uptake by the farmers was that the concept was ordered by the rural training institute, which is an agricultural institution, and not by an environmental NGO or the Ministry of Environment. Biodiversity topics were positively presented without being euphemistic.

The Ministry published a list of organisations that practice farm advisory concerning ÖPUL-measures. Additionally, they accepted specific courses to be eligible (see annex VII).

Other measures or projects where farmers get advice concerning pollinators:

Agri-environmental-measure "nature conservation" (about 20,000 farmers): An ecologist visits the farmer, looks at the areas that are going to take part at the measure, and selects funding measures from an existing list (e.g. late mowing, mowing only 2 times etc.). In some cases, further information on certain species is provided, depends on the ecologist and how much the farmer is interested.

Agri-environmental-measure "Results-based nature conservation plan" (pilot project with 150 farmers): During farm visits ecologists discussed important information about target species with the farmers, including details about their habitats and the types of conditions these species need in order to survive. Target species included pollinators.

Project "Landwirte beobachten Pflanzen und Tiere" (about 600 farmers): see part 1.

Due to the measures of the Austrian Agri-environmental Program crop growing companies have developed specific crop mixtures for the cultivation of fallows which farmers can purchase (examples see Annexes IX to XI).

The Research Institute of Organic Agriculture (Fibl) offers advice about pollinator friendly agricultural practices (creation of flowering strips, information of pollinator friendly crop mixtures, etc.), example see Annex XII.

Part 3: Impact of including or excluding traditionally grazed heathlands or scrub as "permanent grassland".

In Austria we have a pro-rata system on alpine pastures and scrub pastures. This means that the areas covered with forage grasses are eligible for funding, the landscape elements are not included in the forage areas. However, areas where there is only a very small proportion of forage area (e.g. only 3%) can be considered. Only the actual forage area is then considered. In this system, there is a risk of abuse in that something is indicated as a forage area, which is no longer grassland. This is of importance regarding forest pastures, because sometimes there is no grassland in the sense of the definition.

Two questions arise: 1. To what limit can an area covered with shrubs and trees count as a forage area? According to the EU, the limit here is actually 50%. In Austria, areas with a much smaller proportion of forage area are taken into account. 2. Why not get a premium for the valuable structural elements? This question is currently unresolved. But scrub pastures receive the same premium as intensive areas for all Austrian agri-environmental-measures, which is a hidden compensation. For example, an organic farmer gets 225 € for a scrub pasture in the BIO measure although due to the fact that it is an organic farm, the farmer has no additional expenditure for the management of the scrub pasture as no pesticides are used on scrub pastures anyway. There are also specific subsidies for scrub pastures in the nature conservation measure. Scrub pastures are therefore not underpaid in Austria.

The area defined as forage area gets CAP direct payments, the areas with scrub and trees not. Originally scrub pastures got lower CAP direct payments than other grassland areas. This resulted from the change of the „old" system of direct payments („Betriebsprämie") into the new system. In the old system, arable

land got higher payments and grassland got less payments, and so authorities tried to make the transition less hard, when they decided that scrub pastures get little direct payments. This was now changed on demand of the EC.

There are other reasons why scrub pastures are abandoned, which are difficult to compensate for through subsidies. For example, because management no longer pays off in the entire farm structure, or because the farm is run as part-time and has no time to manage the scrub pastures.

Part 4: The effectiveness of actions and schemes deliberately intended to help pollinators.

Agri-environment-climate scheme „Environmentally sound and biodiversity-promoting management" (UBB)

Continuation and improvement of the UBAG measure (environmentally sound management of arable land and grassland) from the previous funding period.

The measure funds the obligatory creation of biodiversity areas on at least 5% of the farm area on grassland and/or arable land.

Requirements on grassland:

- First cut at the same time as the second cut of comparable areas (at the earliest as of the 1st of June)
- No grazing before first cut
- The cut grass has to be removed from the area
- No pesticide use on the whole area
- No fertiliser use before fist cut

Requirements on arable land:

- sowing seed mixtures of at least 4 insect-pollinated plant species until the 15th of May at the latest (this is important for pollinators as the plants should not flower too late in the year)
- kept for at least 1.5 years on the same area
- no fertiliser or pesticide use and

- mown/chopped annually, at least one time, maximally two times per year. On 50 % of the biodiversity area mowing at the earliest of 01.08., on the other 50 % no restrictions concerning mowing date. No grazing or harvesting of seeds.
- Only mechanical removal of the biodiversity area allowed (chopping or ploughing).

Many farmers are also using the option to comply with greening. All farmers in this scheme must attend training on environmental priorities including biodiversity.

The application figures for the previous year (MFA 2018) show the following figures for the measure UBB:

- 67,433 ha of "exclusive" biodiversity areas
- 13,415 ha of biodiversity areas counted from the nature conservation measure

Other areas for nature conservation purposes (not UBB):

- 67.152 ha in the nature conservation measure (not counted for UBB measure)
- 8.118 ha EFA (fallows)
- -3,599 ha of other permanent fallows under the Austrian agri-environmental program (surface water protection, leaching areas at risk of leaching)

That is, a total of 159,717 hectares of agricultural land, which are made available for biodiversity purposes! This year's application numbers will not be available until mid-June.

Success factors of the UBB measure are>

- Obligation to attend training on biodiversity topics
- Horizontal measure for many farmers
- High effectiveness on arable land for butterflies

Effect of biodiversity areas (fallow land) in arable farming on butterflies

A comparison was made of 28 pairs of field parcels, each consisting of one parcel with no implementation as a reference and a field parcel as close as possible with the measure "Biodiversity areas on arable land". Twice in the season, the occurring butterfly species were registered for 10 minutes on a circular area with a radius of 20 m, for a pair of parcels always on the same day and by the same person. The 28 pairs of parcels are divided into three main agricultural production areas to take account of the variation within the Austrian arable area.

The number of species of butterflies on the biodiversity areas was on average more than four times higher than on the parcels without measures (Wilcoxon test, $p < 0.001$). The difference between biodiversity areas and parcels without measures was significant for each of the main agricultural areas studied. With at least 2 and a maximum of 15 butterfly species, there were considerable differences in biodiversity between the individual biodiversity areas, which are particularly related to the plant species richness of the individual parcels (Kendalls Tau, $s = 0.031$, $p < 0.0\ 5$). The measure therefore has a high effectiveness for butterflies and still has potential for further optimization.

Effect of biodiversity areas in grassland on butterflies

32 pairs of parcels, consisting of one mowing meadow parcel without measure as a reference and a parcel as close as possible with the measure "Biodiversity areas on grassland areas" were compared (Holzer et al 2019). Twice in the season, the occurring butterfly species were registered for 10 minutes on a circular area with a radius of 20 m, for a pair of parcels always on the same day and by the same person. The 32 pairs of land are divided into four main agricultural production areas or three categories of grassland areas, differentiated according to the proportion of two-times-mowed or multi-times-mowed meadows.

There was no difference in the number of species of butterflies between the reference mowing meadows and the biodiversity areas (Wilcoxon test, $p = 0.46$). There was also no significant difference within the individual main production areas or grassland categories. The measure therefore does not lead to an increase in the number of butterflies in mowed meadows and would have to be completely redesigned if such an effect is to be achieved.

The condition of the parcel at the time of monitoring was documented (mowed, not mowed...), but this had no effect on the results because the conditions were

different on the different parcel pairs. In other words, there were both biodiversity areas that were mowed and not mowed at time of monitoring, and the corresponding reference areas were sometimes mowed and sometimes not.

Two monitoring rounds were carried out to cover the entire species spectrum. The results of the two rounds were summarized, not compared individually.

Photos of the areas were taken. In the case of fallows (on arable land), the flower density was documented, in the case of grassland it was not documented.

Opinion of Lukas Weber on impact of UBB: Biodiversity areas in grassland have little impact in intensive regions because these are mostly five-cut meadows, where the 1st cut is omitted. Even if at the time of the 1st cut (which happens around the beginning of May in intensive grassland regions), where everything is mowed all around, the biodiversity area could possibly serve as a retreat habitat for insects, from the 2nd cut on (around beginning of June) the biodiversity areas are managed similarly to the "normal" grassland. In intensive grassland areas, meadows are mowed the first time in May (the biodiversity areas are not yet mowed), the 2nd cut is at the beginning of June. Followed by three further cuts. In September, the biodiversity areas look the same all other (intensive) meadows.

It is not entirely clear what measures would be needed in intensive grassland regions to support biodiversity. Evaluation studies suggest that there is a need for non-fertilized, 1-cut-meadows, but this is not an option in the intensive regions, because there are nearly none of these areas in intensive grassland areas. One option would be to remove nutrients (nitrogen) in order to get extensive grassland, but that would not work at 5%, but at most to 1-2%, and it would be very expensive. And it is not clear, if 1-2% of one-cut-meadows or biodiversity areas are enough for insects if all other grassland around is intensively managed.

It questionable whether the horizontal approach in grassland makes sense. In intensive grassland regions, biodiversity areas do not work (see above) and other measures (e.g. remove nitrogen) would be needed, but which would be rather expensive. In extensive grassland regions, the requirements of biodiversity areas may be too "soft". The cutting time would have to be further delayed for it to have effects.

References

Holzer T., Zuna-Kratky T. & Bieringer G.: Bewertung der Wirkung relevanter LE-Maßnahmen auf Tagfalter und Heuschrecken als Indikatorarten für Biodiversität. Evaluierungsstudie im Auftrag des Bundesministeriums für Nachhaltigkeit und Tourismus. Unveröffentlichte Zwischenergebnisse, Projektabschluss und Berichtslegung September 2019.)

2.2 Croatia

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Completed: 24 June 2019

Introduction: Functional relationship between land management for agriculture and the conservation of biodiversity and landscapes in Croatia

There is a large diversity of ecosystems and agriculture land use practices in Croatia - from intensive agriculture in the eastern part of the country, across the karst area with traditional grassland management practices in the middle, to Mediterranean crop cultivation in the coastal area along the Adriatic Sea.

From an agricultural perspective, Croatia can be split into three broad regions: the Pannonian and peri-Pannonian lowland area in the north and in the eastern part (Slavonia), the mountainous region which begins with shallow karst and continues across the Dinaric mountain massifs, and finally, the Mediterranean region which runs along the Adriatic Sea incorporating all the islands, mountains and lowlands along the coastline.

Intensive arable production prevails in the Pannonian region with its fertile soils and large-scale modern farms. Production of cereals, soya, sunflower and sugar beet prevails. Livestock and pig production is intensive with animals kept indoors in modern facilities. Permanent crop production (fruit orchards and vineyards) is also intensive. These systems are characterised by low biodiversity and landscape quality, although there are still some landscape elements (hedges, groups of trees).

Small-scale mosaic landscapes with arable plots, vegetable gardens, traditional orchards and vineyards can be found all over Croatia, especially in hilly areas and along the coast. Farms are small and mixed, with a small number of livestock, pigs and poultry. Livestock sometimes grazes on semi-natural grassland. Many species of conservation value that have disappeared from the intensive agriculture areas can still be found in these agricultural habitats, although some are in decline. Crops are rain-fed with limited, although occasionally rather high use of inputs (mineral fertilisers and PPPs). These systems are associated with high biodiversity and landscape importance.

Extensive production prevails mostly in the mountains, their hinterland and lowlands along the coastline and islands. This is the karst region characterised by a variety of natural constraints such as poor soil conditions, limited growing seasons, steep and inaccessible terrain, remote locations or water shortages. Typically, agriculture involves extensive livestock production (mostly sheep) on HNV species-rich grassland and karst pastures, extensive and semi-extensive olive orchards and vineyards, and some intensive vegetable production. These systems are also associated with high biodiversity and landscape importance.

According the Statistical Yearbook 2017 (CBS, 2017a), Croatia has 1.55 million hectares of utilized agricultural land (UAA). More than half (56 per cent) of the UAA is classed as arable land (CBS, 2017a). Of the 872,406 hectares (ha) of arable land, 60 per cent was given over to cereals. Permanent grassland accounts for 600,000 ha (39 per cent) and permanent crops 73,613 ha (five per cent) of UAA. However, only 71 per cent of the UAA is included in the Land Parcel Identification System (LPIS), which is a precondition for receiving any payments. On 31 December 2018 the LPIS covered 1,080,481 ha (PAAFRD, 2018). Arable land accounts for 832,282 ha (77 per cent) of this area, permanent grassland 184,382 ha (17 per cent) and permanent crops 62,970 ha (7 per cent). Most marginal agricultural land, notably permanent karst grassland, is not regularly farmed or is even abandoned and is thus not listed in the LPIS.

Loss of biodiversity and landscape diversity is predominantly caused by the loss and fragmentation of habitats, as a result of intensive agriculture and infrastructure development, the introduction and spread of invasive alien species, pollution, urbanization and climate change. In addition, accelerated urbanization and the expansion of settlements along the Adriatic coast have a negative impact on landscape diversity.

Although many valuable species are in decline, many of these can still be found in agricultural habitats. Croatian arable land and grasslands host a rich fauna of grasshoppers and butterflies (OG 2017). Most of Croatia's 187 species of daily butterflies can be found in meadow habitats, including the myrmecophyllous genus of large blue *Maculinea*. Croatia has 97 Important Plant Areas (IPAs), covering 964,655 hectares and grassland habitats occur on 87 per cent of them. Changes in farming management practices are one of the major threats to Croatian IPAs (Radford and Odé 2009). Unfortunately, there are no data on status and trends of wild pollinators. According to literature search and interviews with experts from

MoE and Croatian Botanical Museum, there is no research and monitoring of wild pollinators and no experts in Croatia are dealing with the subject of wild pollinators.

In recent years, deterioration of landscapes and a reduction of biodiversity can be observed due to the abandonment of agricultural land or intensification of agricultural activity. Thus, the most critical threat regarding the preservation of habitats and species dependent on or associated with agricultural and forest management in Croatia is the declining number of farmers and decay of traditional, low-productivity agriculture practices. Most of the low productivity grassland is already abandoned, and this trend is most likely to continue. The decline in livestock results in less grazing and less regular mowing leaving large grassland areas abandoned and taken over by woodland. The stocking density is particularly low in areas of high natural value which are in the process of succession by natural vegetation and are turning into forest.

Part 1: How pollinator considerations played a part in Croatia's CAP implementation decisions

Pollinator consideration did not play an important role in the CAP 2014-2020 preparation. However, measures focused on biodiversity protection were given a prominent place in this programme and consequently Croatian CAP 2014-2020 turned to be rather pollinator friendly. All relevant wild pollinator habitat types are protected by one or more CAP measures, both from Pillar I and Pillar II (Table 1). Pollinator conservation is specifically mentioned in RDP, in three operations of M10: establishment of flower strips whose primary function is to provide habitat for pollinators; hedge maintenance and maintenance of extensive orchards. Even though pollinators are not considered in other measures, implementation decisions proved to be very beneficial for them.

The preparation of the CAP 2014-2020 measures happened shortly after Croatia joined the EU (in 2013). Apart from its experience with pre-accession funds (SAPARD and IPARD), Croatia did not have any other experience in designing and administering EU-financed RDP measures. This was the first time that the MoA had to prepare a rural development programme as part of CAP and the work was done under high political pressure to get the RDP approved as quickly as possible. Previous experience with the IPARD and SAPARD was of no use for designing and programming biodiversity protection measures in the RDP because they provided

only support to investments in farms and rural infrastructure. They did not include any agri-environment (pilot) measures and Croatia did not gain any practice in programming and administering them.

Biodiversity (including wild pollinators) was not a focus of the Croatian agriculture policy makers and experts who designed the CAP 2014-2020 measures. However, two important drivers enabled stronger incorporation of biodiversity protection measures in CAP 2014-2020. First was a CAP requirement (EFA and AECM as obligatory elements) and second was a pressure and support from the Ministry of Environment in designing the biodiversity protection measures. A World Bank funded project supported the MoE to support the MoA in designing biodiversity-relevant operations under RDP M10, as well as in shaping the biodiversity-related cross-compliance and greening requirements. The project (i) prepared an assessment of cross-compliance conditions related to biodiversity protection, (ii) prepared a set of biodiversity protection measures to be included in RDP M10; (iii) delivered a comprehensive awareness-raising and training programme; (iv) supported biodiversity-related decisions by preparing relevant background studies and analytical reports on agricultural and nature conservation policies; and (v) established and run an agri-environment demonstration programme.

During the preparation of CAP 2014-2020, the MoA took into consideration relevant biodiversity related data and evidence provided by the MoE and the State Institute for Nature Protection and was in regular communication with these institutions. However, even for the MoE, protection of wild pollinators was not an important objective and it was not specifically considered during the preparation of CAP 2014-2020 measures.

During RDP preparation, the MoA undertook several consultation meetings with stakeholders (farm representatives, foresters, local authorities, environmental NGOs, etc.) But biodiversity protection was not a topic much discussed with them and there is no evidence that wild pollinators were ever mentioned.

More details of how Croatia has taken the needs of pollinators into account through the way it approached its decisions about implementation is given bellow.

Table 1: CAP measures which can affect wild pollinator habitats

CAP measure	***Programming decisions***	**Relevant factors**
Farm Advisory Service, RDP support for advice and training (M1 / M2)	*Whether to offer advice or training through FAS, M1 or M2 on:* *how to manage species rich grassland so as to encourage pollinators* *the creation and management of pollinator borders, in field strips or buffer strips so as to encourage pollinators* *creation and management of pollinator-friendly arable fallow* *pollinator-friendly creation and management of hedges, trees and wood patches* *the management of heath and scrubland to promote pollinators* *ways to manage forest land to promote pollinators*	Needs of wild pollinators were not specifically considered but FAS provide support for implementing biodiversity requirements of cross-compliance, greening, and RDP measures.

Agri-Environment Climate Measure (AECM) and linked non-productive investments (M4.4) (eg for habitat creation and restoration)	*Whether to offer AECM support for biodiversity-friendly grassland management practices & whether management requirements consider pollinator relevance*	An agri-environment option is targeted at the protection of four threatened butterfly species. Needs of wild pollinators were not specifically considered in the other measures but support is provided for biodiversity-friendly grassland management. M10.3: Preservation of high nature value grasslands: Permanent grassland registered as HNV. Application of mineral fertilisers, livestock manure and plant protection products prohibited; Mowing on dates and frequency determined according to regions. The latest mowing date is September 15; only manual mowing or using a finger-bar mower is allowed; Grazing pressure 0.3-1.0 LU/ha. M10.4: Pilot measure for the protection of corncrake (*Crex crex*): High natural value grassland areas within Natura 2000 SPAs, registered as habitat of corncrake (*Crex crex*). Application of mineral fertilisers, livestock manure and plant protection products prohibited; The first mowing after August 15, at least one and maximum two times a year. The latest mowing date is September 15; only manual mowing or using a finger-bar mower is allowed; On parcels larger than 1 ha, an uncut strip (5 per cent of the area) should be left along the edge, Grazing allowed only in autumn (at the earliest from mowing until the end of the current year); grazing pressure 0.3-1.0 LU/ha. M10.5: Pilot measure for the protection of butterflies: Permanent grassland registered as habitat of 4 butterfly types: Scarce Large Blue (*Phengaris teleius*), Dusky Large Blue (*Phengaris nausithous*), Alcon Blue (*Phengaris alcon alcon*) and False Ringlet (*Coenonympha oedippus*). Application of mineral fertilisers, livestock manure and plant protection products is prohibited; Mowing on dates and in a mode determined for each type of butterfly. The latest mowing date is October 1; only manual mowing or using a finger-bar mower is allowed; Grazing allowed only in autumn (at the earliest from mowing until the end of the current year); grazing pressure 0.3-1.0 LU/ha.

	Whether to offer AECM funding for the creation of pollinator borders or strips on arable land	Needs of wild pollinators were specifically considered in sub measure for establishing of flower strips on arable land. Required species or seed mixes are defined. M10.6: Establishment of field strips (flower and grass): Arable areas, min. parcel size of 1 ha. Flower strips should be sown every second year (three times during the commitment period) along the edge of the parcel and are not to be used as a path or passage; width at least 5 m, length at least 100 m. The surface area of the strips can be maximum 30 per cent of the parcel. Flower strips should contain prescribed species. Strips must be mowed two times a year: in July and after flowering (from 15th September till 15th October). Strips can be ploughed on 1st October at the earliest. Application of pesticides on flower strips is not allowed.
	Whether to offer AECM support for Integrated Pest Management and reduced pesticide use	Needs of wild pollinators were not specifically considered but support is provided for reduced pesticide use. For example, a measure to support mechanical control of weeds within rows (under trees or vines) and prohibit application of herbicides inside rows (under the trees or vines).
	Whether to support the creation, restoration and biodiversity-friendly management of hedges, trees and wood patches through the AECM.	Needs of wild pollinators were specifically considered in sub measures for maintenance of extensive orchards (see below) and hedges. The measure for extensive orchards includes installation of artificial nesting aids for solitary bees. M10.7: Maintaining extensive orchards: Extensive orchards with 50-200 trees/ha. Application of mineral fertilisers is forbidden, only solid manure application under the tree crown is allowed; Only plant protection products and methods approved for organic production are permitted; The ground surface of orchards (including under trees) is maintained by grazing (goats, sheep, cattle or poultry, maximum 1.0 LU/ha), or mowing at least once a year but not later than 1st October; Establishing at least one bee house for solitary bees/ha.

		M10.11: Preservation of hedges: Areas with hedges, parcels with min. 60 metres of registered hedge. Maintain hedges by pruning once every two years in order to keep their shape. Pruning hedges is not allowed in the period from 01 March to 31 August. Missing hedge parts are replaced with autochthonous or domesticated species of shrubs and trees. The ground alongside the hedge, up to a width of a minimum 1 m, must be covered with natural vegetation. PPP and fertilizer application are forbidden in this area. The measure for dry stone walls can also provide solitary bee nesting habitat: M10.10: Preservation of dry stone-walls: Areas with stone walls, parcels with min. 30 metres of registered stone wall. Maintaining the stone wall using traditional materials and workmanship, which means stacking stones without mortar; To prevent vegetation overgrowth, unwanted vegetation must be removed manually, without using herbicides. M4.4.1: Non-productive investments related to environmental preservation: Eligible investments: building terraces and stonewalls and planting hedges; restoring habitats (primarily focused on overgrown grasslands); renovation of derelict traditional ponds for livestock.
	Whether to offer AECM for the creation and maintenance of wildlife fallow, e.g. through natural regeneration over a year or more or with wild seed mixes for pollinators.	No
	Whether to program AECM for restoration and maintenance of grazed heath and scrub habitats.	Yes, for maintenance of karst grassland (part of HNV grassland)

Organic farming support	*Whether pollinator conservation is mentioned as a reason for supporting organic farming.*	No
Other RDP measures	*Whether to programme the RDP measures for agroforestry forest conservation, and environmental afforestation* *Whether to offer forest restoration support for the conversion of closed coniferous stands to open mixed deciduous forest.*	These measures could increase the flower richness of permanent crops: M10.2: Grassing of permanent crops: Permanent crop areas on 9-15 per cent slopes. The soil between rows must be covered with a grass-clover or clover-grass mixture during the five-year commitment period; Development and implementation of a five-year fertilization plan where the maximum amount of nitrogen is adjusted respecting the content of nitrogen residue from clover-grass or grass-clover mixture. M10.8: Maintaining extensive olive groves. Extensive olive orchards with 25-150 trees/ha. Application of mineral fertilisers is forbidden, only solid manure application under the tree crown is allowed; Only plant protection products and methods approved for organic production are permitted; The ground surface is maintained by mechanical cultivation, or grass mowing, or keeping livestock in olive groves (sheep and goats). M10.14: Improved management of inter row area in permanent crops: Permanent crop areas on slopes less than 9 per cent. Sowing the area between rows with one of the prescribed mixtures; Managing the area between rows by mowing or mulching at least 4 times per year; The area between rows must be covered with grass during the five-year commitment period. M10.15: Organic fertilizers in permanent crops: Application of mineral fertilisers is prohibited. Only fertilizers, soil enhancements and nutrients (including livestock manure) approved in organic production are allowed. Needs of wild pollinators were not considered in forestry measures.

GAEC rules	*Whether to protect buffer strips through cross-compliance by listing them under GAEC 7 (beyond what is legally required by Water Framework Directive rules and/or nitrate action plan rules).* *Whether to protect hedges, trees and tree patches from destruction by listing them as landscape features under cross-compliance GAEC 7, and whether any additional conditions are defined that might benefit pollinators.*	Needs of wild pollinators were not specifically considered but hedges, trees and some other elements are listed and protected as landscape features under cross-compliance GAEC 7. Removal of hedges and other landscape features is prohibited, cutting of hedges and woodlands is not allowed in the period March 01 – August 31.
Greening: permanent grassland rules	*Whether to protect permanent grassland from ploughing completely by designating it as ESPG*	All the important Annex I grassland habitats in Natura 2000 areas are designated as ESPG. Ploughing is prohibited. MS may have intended the ploughing ban as a means of preventing the intensification of grassland management with potential loss of pollinators.
Ecological Focus Areas	*Was the pesticide ban on nitrogen-fixing crops communicated as being good for pollinators and were pollinator-friendly N-fixing crops included?* *Whether to allow hedge, tree and tree patch landscape features to count towards the greening EFA requirements.*	Needs of wild pollinators were not specifically considered. Landscape features, fallow land, forest edges, short rotation coppice counting towards the greening EFA requirements. EFA options are: Land lying fallow: no sowing or planting in the period February 15 – August 15. Pesticides prohibited. Grazing prohibited; mowing allowed. Sowing of bee meadow seed mixtures allowed.

	Whether to allow fallow with naturally developed vegetation to count towards the greening EFA requirements *Whether to allow forest edges, short rotation coppice, agroforestry and environmental afforestation to count towards the greening EFA requirements.*	Buffer strips and strips of eligible hectares along forest edges: grazing allowed Areas with short rotation coppice: mineral fertilizers and pesticides prohibited. Areas with catch crops or green cover: pesticides prohibited Areas with nitrogen-fixing crops: pesticides prohibited Landscape features: count towards the greening EFA requirements
Pillar 1 eligibility rules	*Whether the Member State has chosen to extend its definition of "permanent grassland" to include other land on which traditional grazing practices take place.* *Whether the MS has chosen to protect grassland from ploughing without re-seeding, and from conversion to arable, by defining "permanent grassland" to include traditionally grazed areas.* *Whether to define the eligibility rules for wooded agricultural land to help support the viability of wood pasture farming systems*	Needs of wild pollinators were not specifically considered but definition of "permanent grassland" is extended (karst grassland as traditionally grazed areas are added) giving these areas access to direct payments.

Part 2: Advice made available to land managers to help them encourage pollinators

Croatian Farm Advisory Service (FAS) is the main source of information on pollinators in Croatia. Due to the initiative of Ms Marija Ševar, a long-term head of FAS's Department for Organic Farming and a dedicated expert on pollinators, the FAS started already in 2002 with a comprehensive programme on promoting and encouraging wild pollinators, notably solitary bees.

The government-run Farm Advisory Service (FAS) has been in place for more than 20 years. It employs approximately 300 farm advisors in 120 local offices. It is the most important, and most reliable source of advice for the farming community. The FAS offers a range of advisory, promotion, demonstration and training services, including those on wild pollinators, notably solitary bees. The FAS is partly funded by RDP and partly by the Treasury (national money). All FAS services are free of charge for farmers. In 2018, 20 per cent of all direct payment recipients (and since 2015 more than 50 per cent) received advice on biodiversity-related cross-compliance requirements – via workshops, lectures, demonstrations and face-to-face advice. The FAS is also one of the key institutions providing compulsory training on the sustainable use of pesticides, prescribed by the National Action Plan to Achieve Sustainable Use of Pesticides for the period 2013–2023. This training programme provides some information on pollinators, too.

The most important and robust FAS's programme on wild pollinators is the compulsory training for beneficiaries of RDP M11 (organic farming). Solitary bees are the central theme of the training on wild pollinators. In the period 2016-2019, as many as 4,400 farmers took part in this training (Table 2). The training is delivered primarily by the regional extension officers responsible for organic farming, or by those responsible for plant protection. These trainers have various backgrounds. Most of them are agronomists and are not specialists for wild pollinators. However, to be able to provide advice on this topic they have been (internally) trained by Ms Marija Ševar and other experts. All training materials they use for training M11 beneficiaries are standardised and provided by the core team led by Ms Marija Ševar. The training on wild pollinators lasts for one hour and covers the following topics:

- Biology and ecology of wild pollinators;

- Importance, ecosystem services and benefits delivered by wild pollinators;
- The role of wild pollinators in pollination of cultivated crops;
- How to protect wild pollinators and build them shelters/habitats.

Solitary bees (notably *Osmia cornuta* and *Osmia bicornis*) are the central theme of the training but information is provided also on bumblebees (notably *Bombus terrestris, Bombus lapidaries, Bombus lucorum*), the lacewing (*Chrysoperla carnea*), hoverflies (*Episyrphus balteatus* and *Eupeodes* sp.) and other wild pollinators.

Information on wild pollinators, notably solitary bees is also provided at the compulsory training for beneficiaries of M10, especially those inscribed in the operations on (i) establishment of field strips, (ii) maintaining extensive orchards and (iii) maintaining extensive olive groves. However, since the beneficiaries of these operations account for just 5 per cent of all M10 beneficiaries, wild pollinators are not covered as good as in the training programme for M11 beneficiaries.

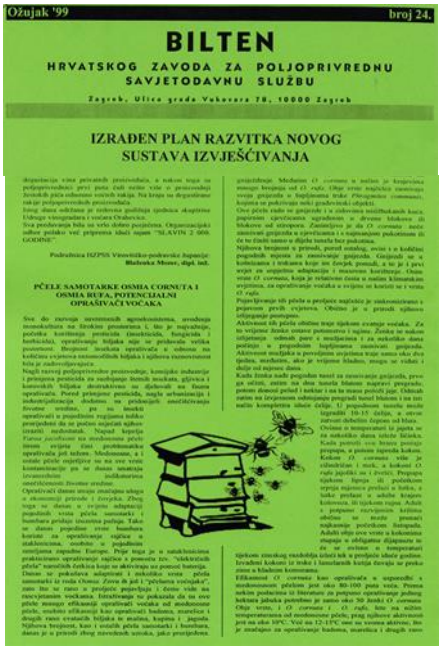
Table 2: Compulsory education on wild pollinators for M11 beneficiaries in the period 2016-2019 (Source: FAS)

Year	Nr. of trainings	Nr. of participants	Average Nr. of participants
2016.	132	2,675	20
2017.	56	798	14
2018.	56	743	13
2019.	18	185	10
Total	265	4,400	16

Figure above: Mr Ivan Pelin, an organic fruit grower that attended the FAS training programme on wild pollinators created shelters for solitary bees and reports much higher yields since, notably of pears (Photos: Agroklub and FAS)

Figure above: "Hotel" for solitary bees at an organic olive grove of Mr Stipe Čirjak (Photo: Zadarski list)

Besides the training programmes for RDP beneficiaries, the FAS provides advice on wild pollinators to all other farmers, as well as to some other groups. The FAS's programme on conservation of wild pollinators commenced a long before Croatia joined the EU and started implementing the CAP. The FAS published its' first article on solitary bees in 1999. The first trainings begun in winter 2002. In the period 2002-2015, FAS organised or took part in nearly 100 events (mainly trainings) attended by more than 10,000 farmers.



Ožujak '99 broj 24.

BILTEN

HRVATSKOG ZAVODA ZA POLJOPRIVREDNU SAVJETODAVNU SLUŽBU

Zagreb, Ulica grada Vukovara 78, 10000 Zagreb

IZRAĐEN PLAN RAZVITKA NOVOG SUSTAVA IZVJEŠĆIVANJA

PČELE SAMOTARKE OSMIA CORNUTA I OSMIA RUFA, POTENCIJALNI OPRAŠIVAČI VOĆAKA

Figure above FAS's first article on solitary bees was published in FAS's bulleting in spring 1999.

In order to reach a wide target group, FAS uses a range of information transfer channels, including:

- Media: TV and radio broadcasting (in both cases mainly national public TV and radio);
- Farmers' and other magazines;
- Own publications;
- Own website.The FAS does not have a dedicated Web site on the conservation of wild pollinators but the information on wild pollinators is available in various sections and archive at the FAS main Web site www.savjetodavna.hr/
- Demonstrations at farmers already using wild pollinator "hotels".
- Lectures/presentations and workshops, many of which are organised in order to show farmers how to prepare shelters ("hotels") for wild pollinators. The shelters prepared during those workshops are provided to the attendees or some other farmers.

- Farmers' and other fairs.

Figure above FAS's publications on beneficial insects and wild pollinators (Photo: Neda Uljanić)

Figure above FAS's announcement for stone fruit growers from April 2019[3] warning them that the use of certain insecticides is not allowed because of protection of bees, bumblebees and solitary bees

Figure above "Hotels" for wild pollinators in the orchard of Bašić family farm in Slavonski Kobaš (left) and in an olive grove at Cirjak family farm in Popovići (Photo: FAS)

[3] https://mps.gov.hr/obavijest-vlasnicima-plantaznih-nasada-koscicavog-voca/

Figure above: Workshop on the preparation of shelters for beneficial insects and wild pollinators held at family farm Džakula in Sjeverovec (photos: FAS)

Figure above: Shelters for solitary bees and lacewing distributed to twelve fruit growers in Velika Gorica region (photos: FAS)

Since years the FAS has been promoting introduction of solitary bees among beekeepers. Most of these are not involved in farming. Except for few professional beekeepers, most of them are small-scale backyard garden beekeepers. In cooperation with the Croatian Bees Society, Association of Pula Beekeepers, Associations of Ogulin Beekepers and Bedekovčina Secondary School, FAS delivered a range of training and advice activities for beekeepers. These are quite popular and have been attended by 5,200 participants.

Although the FAS's primary target group is farmers, its work on promoting wild pollinators reaches far beyond the farming community alone. Promotion of wild pollinators have been organised to all kind of audiences, including general public, university students, primary and secondary school pupils and even kindergarten

children. The most notable activities with non-farming community include the cooperation with:

- Museum of natural history in Rijeka (installed a "hotel" for solitary bees);
- Museum of natural history in Zagreb;
- Varaždin Muzeum (collection of Franjo Koščec);
- National Park Risnjak;
- Nature Park Kozjanski, Slovenia;
- Biology teachers of primary and secondary schools in Primorje-Gorski Kotar County.

Figure above: A "hotel" for wild pollinators installed in a kindergarten in Lupoglav (photo: FAS)

Part 3: Impact of including or excluding traditionally grazed heathlands or scrub as "permanent grassland".

Extension of permanent grassland definition to karst grassland: Croatia has adopted an extended definition of "permanent grassland" just for traditional grazing. To include traditionally grazed and hay-making karst grassland to become eligible for the CAP payments, Croatia has listed karst grassland under "permanent grassland" category. Besides karst grassland, Croatia has no other significant traditionally used "grassland" areas (such as heathland and scrub) that are valuable habitat for pollinators.

Croatian karst grassland spreads over barren, non-forested rocky ground terrain of the karst mountains, hills and valleys. It is a stony landscape of hollow nature with sinkholes, caves, streams and springs that sink into subsurface caverns. Grasslands on karst are prone to karstation. It is a process through which the seeping water loosens up and dissolves massive soluble limestone rock formations to form cavities, pipes, and conduits that, as time goes by, become gaping holes. The karst grasslands are one of the first colonizers of shallow, rocky soils. Most have been formed by invading vast areas of forests that were cleared by the charcoal makers and the Venetians who needed lumber for building their vast flotilla and for constructing the city (Venice was built on thousands of stilts coming from Croatia). The karst grassland vegetation is dominated by the low, frugal plants capable of surviving the harsh climate and soil conditions. Although karst grasslands do not yield much (usually 800-1,400 kg hay per ha), they are exceptionally biodiversity rich. They are made up of grass and legume species, mixed with aromatic herbs, such as lavender, sage, thyme, rosemary, etc., accompanied by Maquis and similar scrubland composed of mainly oak, ash, juniper, arbutus and rose family species. In wintertime karst grasslands look like a bare stony/rocky area sparse in vegetation. Karst grasslands are grazed by (mainly native) sheep, goat, cattle – and to a less degree horse and donkey breeds (all supported by the AECM 10.9). Many Croatian karst grasslands harbour >50 (some >70) plant species per square metre. Pastures prevail over hay meadows. The flower-rich karst grasslands are home to many pollinator species, including bees, bumblebees, bats, butterflies, moths, and flies. However, in the last decades, due the decline in rural population, notably livestock farmers, karst grassland area is in decline. Due to the lack of mowing and grazing, the karst grassland is being taken over by natural succession. Fern, birch, juniper and other woody species gradually overgrow the grassland vegetation turning karst grassland into shrub and forest – habitats with a significantly lower biodiversity value, harbouring far less pollinators.

There are multiple reasons why Croatia decided to proclaim karst grassland as permanent grassland. Most of these reasons are not primarily "biodiversity-driven" and deliberately aiming at protecting and enhancing pollinators. However, it is worth mentioning them, as this wider context led to the inscription of karst grassland in permanent grassland – a decision that is definitively beneficial for pollinators. The most important reasons for listing karst grassland as permanent grassland include the following:

Karst grassland occupies a significant part of the agricultural area

Approximately 55% of the Croatian land territory can be classified as karst. Permanent grassland (comprising mainly sloppy pastures on rocky ground, to a lesser degree meadows) is a predominant type of land use in the Croatian karst, accounting for 39% of the total land area (followed by forest – 37%). However, these are just estimates. The exact data on the area covered by the karst grassland is not known because:

- Most karst grassland is overgrown by natural succession and it is quite arbitrary whether these areas are still predominantly "grasslands" or "shrubs/forests".

- Out of 607,000 hectares of utilized permanent grassland in Croatia, only one third is inscribed in the Land Parcel Identification System (LPIS). This is mainly due to unresolved ownership issues or because this land is farmed extensively by (semi)subsistence, mainly elderly farmers who are not interested and/or skilled enough to cope with the CAP administrative requirements. These two problems are particularly pronounced by karst grassland. Consequently, in 2018, just 74,212 ha (of probably three times bigger area) of the karst grassland was inscribed in LPIS, accounting for 37% of all permanent grassland and 77% of all pastures inscribed in LPIS.

Biodiversity protection

The karst region is exceptionally rich in biodiversity. All eight Croatian National Parks and seven out of its eleven Nature Parks are located in the karst region. The region also features several areas under special nature protection regime (strict reserves, botanical reserves, endemic species areas and botanical gardens). With >3,000 plant taxa, of which >150 are endemic, the karst area is Croatian biodiversity hot spot. It harbours a range of habitats and flora and fauna species, including numerous insect species.

Water protection

The karst grassland is exceptionally prone to leaching. Streams and surface runoff enter sinkholes and caves, and bypass natural filtration through soil and sed-

iment. Groundwater carrying pesticides and plant nutrients can travel quite rapidly through these underground networks – up to thousands of meters per day – transmitting contaminants to wells and springs in the vicinity.

Soil carbon

Karst grasslands are very important from the carbon sequestration point of view. Their aboveground and underground biomass stores significant amount of carbon, most of which is converted into stable humus – one of the least degradable forms of carbon.

Support extensive livestock management and animal welfare, protection against wildfires

Extensive livestock husbandry has been for centuries the backbone of the economic prosperity and survival strategy of many families living on the Croatian karst. However, extensive livestock husbandry can no longer economically survive without subsidies. The CAP, notably AECM payments are essential for maintaining livestock production and karst grassland in these areas. These subsidies enable many families to remain living in the karst region. The CAP subsidies are an important impetus for revival of marginal rural areas, small family farms and low input, traditional farming.

Supporting karst grassland and extensive livestock husbandry makes a positive contribution to animal welfare. Livestock in the karst region is reared in a traditional manner. Animals are kept mainly outside and can exercise natural movements. They graze and/or are fed on hay in winter and there is hardly any application of veterinary medicine.

Keeping karst area, notably grassland free from woody vegetation is an important measure preventing wildfires. As much as 80% of wildfires in Croatia occur in the karst area, with an average of 9,000 ha being burnt annually.

Protection of geological and cultural heritage

Croatian karst is home to numerous sinkholes, underground streams, pits and caves featuring dripstones and stalagmites hiding an entire world of endemic underground animal species. The karst area is home to unique karst grassland-linked cultural heritage features, such as dry stonewalls, livestock ponds and traditional shepherds' shelters made of stone. Among these, particularly important

are dry stonewalls. Built to prevent sheep from wandering into someone else's property, they are monuments to amazing human hard work, skill and patience. Stonewalls are also habitat and shelter to numerous species (notably thermophilic ones), mostly reptiles, amphibians, and insects, including pollinators. Due to their linear structure, stonewalls are also important landscape features, serving as corridors supporting movement of various animals.

Part 4: The effectiveness of actions and schemes deliberately intended to help pollinators

Impact of Farm Advisory System promotion of pollinators

No evaluation has been undertaken to assess the impact of FAS's promotion of the conservation of wild pollinators. However, the most notable impacts include the following:

- Shelters ("hotels") for wild pollinators (mostly for solitary bee) have been installed in many organic and conventional orchards[4]. No precise figures are available about how widespread this technique is, but it has become quite popular. Many farmers report noticeable increase in yields (about 30 per cent)[5].
- Establishment of at least one shelter for solitary bees per hectare of orchard is a compulsory requirement for all beneficiaries receiving support from M10 operation on the maintenance of extensive orchards;
- Most beekeepers in Croatia have installed shelters for solitary bees next to their (stationary) beehives. The FAS is quite proud of this achievement because in the beginning most beekeepers considered solitary bees to be foes and competitors to common bees.

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4 Although the conservation of wild pollinators is popular by fruit growers (because of the direct economic benefit), it is hardly being practised by arable and other farmers. In 2018 not a single farmer implemented M10 operation on the establishment of flowering field strips.

5 The yield increase in pear orchards is often reported to be more than 50 per cent). Common bees are poor pollinators of pear because they are not in fond of amylin, a compound excreted by flowering pear trees.

- Ms Ševar of the FAS is invited once a year to deliver a presentation on wild pollinators to the students of the Faculty of Agronomy of the University of Zagreb.
- The Faculty of Veterinary of the University of Zagreb introduced a compulsory study subject on wild pollinators.
- A few entrepreneurs started commercial production of shelters for solitary bees. Among them, the most advanced is a young (26) mechanical engineer Mr Josip Popčević who has recently attended a workshop on wild pollinators in Brussels. He has plans to expand his business and some commercial banks showed interest to provide him a soft loan from their "green businesses" financing lines[6].

Figure above Mr Josip Popčević, a young entrepreneur who started commercial rearing and distribution of solitary bees (Photos: Agroklub)

[6] The current Croatian legislation does not recognise wild pollinators as "domestic animals". Consequently, their commercial rearing and placing at the market is linked to some administrative burdens. The FAS is of the opinion that if wild pollinators were declared endangered/protected species (such as wolf, bears, lynx, etc.) it would be much easier to organise their commercial rearing and distribution.

Conclusion

Considering the above-mentioned, the following conclusions can be drawn:

- FAS is the main (if not the only source) of information on the conservation of wild pollinators in farming (there are no NGOs or other organisations providing advice on this).
- FAS provides advice on wild pollinators also to non-farming communities.
- The FAS's programme on wild pollinators is one of its oldest and long-lasting activity. It has received considerable public and media attention and is getting more popular among farmers and other stakeholders.
- Although the conservation of wild pollinators appears to be a FAS's activity, the entire programme has been "pushed and pulled" by one person – Ms Marija Ševar. She is about to be retired and it is not quite clear how and to what extent FAS is going to continue working on the conservation of wild pollinators.

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2.3 France

Author: Oréade-Brèche

Completed: June 2019

Part 1: How pollinator considerations played a part in France or the region's CAP implementation decisions

In France, RDP are implemented at Regional level. Still a national RDP provides a framework for regional implementation (e.g., the list of AECM available at regional level is defined in the national RDP). The analysis of Pillar II measures thus sometimes needs to be made at regional level. When necessary, the analysis thus focuses on three regional RDPs in three regions: Centre Val de Loire, Aquitaine and Midi-Pyrénées. These Regions were chosen based on various criteria: the presence of a regional declination of the Nation Action Plan (NAP) on wild pollinators, our knowledge on specific Regions that support actions specifically targeting pollinators, and opinion of stakeholders (e.g. Serge Gadoum, in charge of the National Action Plan for wild Pollinators).

RDP	Identified by the interviewee	Regional implementation of the NAP on wild Pollinators	Regions that support actions specifically targeting pollinators or apiculture
Centre Val-de-Loire	X	X	X
Midi Pyrénées	X		X
Aquitaine	X	X	

Generally speaking, pollinators have little been explicitly considered nor mentioned when implementing the CAP even if different policies exist both at national or regional levels that directly target pollinators (e.g., NAP on wild pollinators and

regional declinations). This can be explained by the fact that the CAP was mainly design by the Ministry of Agriculture and by dedicated services in the Region with often little concertation with the Ministry of Environment (in charge of the NAP on pollinators) or regional services in charge of biodiversity. For instance, at national level, the implementation choices were first discussed within the Ministry of Agriculture. Once a Ministry position was agreed upon, the concertation with different stakeholders began. However, no multilateral discussion was organized; negotiations were mostly bilateral between the Ministry and every stakeholder. Technical groups were formed on some issues; they mostly consisted of the Ministry of Agriculture and of representatives of farmers' organisations (e.g. APCA, FNSEA). Other stakeholders were occasionally consulted. For instance, environmental organisations (e.g. the Federation of regional natural parks, FNE, PAC 2013 platform) and the French Ministry of Environment were consulted on some specific issues once the main orientations had been established.

Still even if pollinator protection is little mentioned in the description and objectives of the measures and instruments of the CAP, various measures and instruments more generally target environment or sometimes biodiversity. Moreover, some example of targeting toward the protection of pollinators can be highlighted.

According to the Ministry of Agriculture, the FAS did not affected the offer of advice and training. In France, many structures already provide advisory services to farmers before the FAS, especially Agriculture Chambers. As regards M1 and M2, they have been little programmed in regional RDPs and when programmed their implementation has been limited due to administrative burden issue (see Part 4). M1 have still been programmed in the three RDPs analysed. However, no specific target on pollinators is mentioned in these RDPs. This measure more generally targets environmental and agroecological objectives. M2 is only programmed in Midi-Pyrénées and also target (among others) agroecology without specific mention to pollinators.

In France, a list of Type of Operations (TO) available under the AECM measure is provided in the national RDP. The specific TOs of relevance for this study are listed and presented in the table above. This shows that:

- Many TOs support biodiversity friendly grassland management practices even if pollinators are seldom explicitly mentioned;

- Three TOs specifically mention pollinators and/or auxiliary flora by promoting the sowing of seed mixtures favourable for pollinators and limiting disturbance (no PPP, no tillage...) on fallow, cover and border or strips on arable land;

- Various TOs focus on IPM and reduced use of pesticides even if pollinators are explicitly mentioned in only 3 of them;

- Five TOs specifically target the maintenance and creation of ecological corridors for wild fauna including insects on which no phytosanitary products can be used. Aging and decaying hedges are also protected for their specific role in providing insect habitats (LINEA 9);

- Two TOs specifically target the maintenance, improvement and creation of fallows and perennial herbaceous covers by adapting the cover to species requirements. One of them explicitly mentions pollinators (COUVER_08);

- Five TOs specifically target the restoration or the maintenance of the open character of grazed heath and scrub habitats to conserve a pastoral activity in biodiversity rich areas;

- One TO targets domestic bees with secondary objective to protect biodiversity in the area where beehives are set.

Various GAEC and SMR can directly or indirectly affect pollinators even if this is not explicitly mentioned. Only GAEC 1 mentions that fostering natural enemy species and biodiversity as one of the objectives of this GAEC.

On the Green Payment, in France the ESPG concerns 1) land declared in 2014 as rough grazing and mountain pastures, localized in Natura 2000 areas and 2) Natural meadows located in Natura 2000 areas in the zones which have been identified as of particular interest in terms of biodiversity according to a study by the Natural History Museum. This study does not have a specific focus on pollinators but the selection of zones of interest for biodiversity is based on the list of plant and animal species of community interest defined in the Habitat Directive. The permanent grassland ratio conservation is set at regional level in France with an authorisation regime to be implemented if the ratio reaches a 3% decrease. There was no direct link between this choice and the objective of pollinators protection.

Since 2015, the heaths and rangeland used as pastures land but where grass cover is not dominant, are eligible to direct payments, providing that the agricultural parcel is suitable for grazing. In order to exclude ineligible features such as rocks, no grazable trees, etc., a pro rata system has been implemented that attributes each area with a percentage representing the share of grazable area.

Table 1: CAP measures which can affect wild pollinator habitats

CAP measure	Programming decisions	Relevant factors
Farm Advisory Service, RDP support for advice and training (M1 / M2)	*Whether to offer advice or training through FAS, M1 or M2 on:* *how to manage species rich grassland so as to encourage pollinators* *the creation and management of pollinator borders, in field strips or buffer strips so as to encourage pollinators* *creation and management of pollinator-friendly arable fallow* *pollinator-friendly creation and management of hedges, trees and wood patches* *the management of heath and scrubland to promote pollinators* *ways to manage forest land to promote pollinators*	According to the Ministry of the Agriculture, the FAS did not affected the offer of advice and training. In France, many structures already provide advisory services to farmers before the FAS, especially Agriculture Chambers. These latter should be recognized as a FAS in 2019. As regards M1 and M2, they have been little programmed in regional RDPs and when programmed their implementation has been limited due to administrative burden issue (see Part 4). M1 have still been programmed in the three RDPs analysed. However, no specific target on pollinators is mentioned in the RDPs. This measure more generally targets environmental and agroecological objectives. M2 is only programmed in Midi-Pyrénées and also target (among others) agroecology without specific mention to pollinators.

Agri-Environment Climate Measure (AECM) and linked non-productive investments (M4.4) (eg for habitat creation and restoration)	*Whether to offer AECM support for biodiversity-friendly grassland management practices & whether management requirements consider pollinator relevance*	In France, a list of Type of Operations (TO) available under the AECM measure is provided in the national RDP. The specific TOs of relevance for this study are listed below together with the description of their objectives and actions promoted in relation to pollinators. Many TOs support biodiversity friendly grassland management practices even if pollinators are seldom explicitly mentioned. LINEA_08 - Maintenance of refuge strip on Grasslands Establishment of protection zones (refuge strips with restricted practices) for flora and grassland avifauna. Can target remarkable environments: low-marsh, tuff marsh, peat bogs ... HERBE_03 - Total absence of mineral and organic nitrogen fertilization (excluding possible input by grazing) on grassland Absence of fertilization to foster floristic biodiversity and the preservation of an ecological balance especially in remarkable (wetlands, peat bogs, etc.). HERBE_04 - Adjustment of the grazing pressure over specific periods (loading in the field on remarkable environment) Improve the management of grazing to preserve the biodiversity especially in remarkable environments (wetlands, peat bogs, wet meadows, etc.) by avoiding degradation of soil and flora through settlement. Avoid under and overgrazing and maintain the opening and renewal of the forage resource. HERBE_06 - Mowing delays on grassland and remarkable habitats Mowing delay to allow reproduction cycles of species specific to remarkable habitats. Conservation of unmown or delayed areas, especially at the edge of the plot. Criteria for location, mowing period, prohibition of PP on committed areas, no tillage. HERBE_07 - Maintaining the floristic richness of a permanent grassland Maintain permanent grasslands rich in floristic species. Objective of maintaining natural habitats and species habitats. Non-reversal of grasslands, prohibition of plant protection products, low frequency of

		use, first late use and limited fertilization. Outcome Criteria: presence of at least 4 indicator plants in the environment (regionally dependent). HERBE_08 - Maintenance of remarkable grassland by non-motorized mowing Maintain non-motorized mowing for permanent grassland to prevent grazing that reduces biological diversity (sorting of plants, earlier passage of herds). Restricted mowing periods and mowing techniques; prohibition of grazing, ploughing and use of phytosanitary products. HERBE_09 - Improvement of pastoral management Maintain pastoral areas by avoiding overgrazing or undergrazing to maintain mosaic habitats. Establishment and implementation of a pastoral management plan, prohibition of ploughing and use of phytosanitary products. HERBE_11 - No grazing and mowing in winter on meadows and remarkable wet habitats Maintain biodiversity on grasslands and remarkable habitats by avoiding over-trampling and early grazing and by prohibiting grazing and winter mowing. Prohibition of ploughing and of the use of phytosanitary products, respect of mowing and grazing periods. HERBE_12 - Water maintenance of grassland lowlands Maintain biodiversity in floodplain meadows by maintaining floodplain. Establishment and implementation of a management plan, prohibition of ploughing and of the use of phytosanitary products. HERBE_13 - Management of wetlands Maintain practices beneficial for wetland protection and promotion (permanent grasslands, in extensive agricultural production, etc.). Establishment and implementation of a management plan, respect of intervention periods, respect of average loading, limitation of fertilization, prohibition of ploughing and of the use of phytosanitary products. SHP_01 - Individual operation of grazing and pastoral systems - maintenance Preserving the sustainability of permanent grasslands with diverse flora and of specific interest. Farm level

		TO. 70% of the UAA in grassland area, less than 1.4LU/ha, maintenance of grassland area and no use of phytosanitary products on grassland area, maintenance of floristic diversity on grassland identified as of specific interest. SHP_02 - Collective action for grazing and pastoral systems - maintenance Similar to SHP_01 for collective pastoral entities.
	Whether to offer AECM funding for the creation of pollinator borders or strips on arable land	Three TOs specifically mention pollinators and/or auxiliary flora by promoting the sowing of seed mixtures favourable for pollinators and limiting disturbance (no PPP, no tillage...) on fallow, cover and border or strips on arable land. COUVER_05 - Creation and maintenance of a network of ecological regulation areas. The principal objective of this TO is to foster functional biodiversity and reduce the intensity of use of PPPs but it relies mainly on the creation and maintenance of ecological regulation areas (from 5 to 20 meters wide) within and between plots with no phytosanitary product, respect of intervention periods, permanent cover, etc. Various covers are eligible, including favourable mixtures for the development of pollinating insects and auxiliaries. The definition of what is considered as favourable for pollinators is to be defined at local level[7]. COUVER_07 - Creation and maintenance of cover of floristic or faunistic interest. Replace arable land with cover favourable for the biodiversity, i.e. for a specie, a group of species or pollinators and auxiliaries (more specifically messicole plants)[8]. Criteria for location, maintenance

[7] Les catégories de couverts suivants sont éligibles : [...] mélanges favorables au développement des insectes pollinisateurs et auxiliaires de culture

[8] «L'objectif de cette opération est de remplacer des surfaces cultivées en grandes cultures par un couvert favorable répondant aux exigences spécifiques : d'une espèce, d'un groupe d'espèces, aux insectes pollinisateurs et auxiliaires de cultures »

		of the covered surface over the 5 committed years, and maintenance period of non-intervention on the cover (90 days between the 15th April and 31st July), prohibition of phytosanitary products and fertilisers (limitation or prohibition). LINEA_05 - Mechanical maintenance of grassed banks in cultivated plots. Preserve existing embankments and their continuity as a habitat for auxiliary flora and fauna. Maintain a permanent herbaceous cover, no mechanical intervention, no burning, annual maintenance by mowing, no phytosanitary products.
	Whether to offer AECM support for Integrated Pest Management and reduced pesticide use	Various TOs focus on IPM and reduced use of pesticides even if pollinators are explicitly mentioned in only 3 of them. SGC_01 - Field Cropping Systems Operation. Support the change of field-farming practices across the farming system and the improvement of environmental performance over the long term[9]. This TO requests diversification, rotation lengthening and limiting use of fertilisers and phytosanitary products. One of the secondary targets of this TO is to limit the decrease in pollinator population. SGC_02 - Field crop system operation adapted to intermediate areas. Support the change of practices in so-called "intermediate" areas throughout the operating system and improve environmental performance over the long term[10]. This TO requests diversification, rotation

[9] "Les projets mobilisant cette opération devront cibler en priorité les territoires à enjeu eau mais également prendre en compte les autres enjeux territorialisés, qu'il s'agisse de la préservation de la biodiversité ordinaire (déficit d'IAE, absence de diversité culturale, disparition des plantes messicoles, des auxiliaires et des pollinisateurs) ou de la qualité des sols (zones de limons pauvres en matière organique)."

[10] "Les projets mobilisant cette opération devront cibler en priorité les territoires à enjeu eau mais également prendre en compte les autres enjeux territorialisés, qu'il s'agisse de la préservation de la biodiversité ordinaire (déficit d'IAE, absence de diversité culturale, disparition des plantes messicoles, des auxiliaires et des pollinisateurs) ou de la qualité des sols (zones de limons pauvres en matière organique)."

		lengthening and limiting use of fertilisers and phytosanitary products. One of the secondary targets of this TO is to limit the decrease in pollinator population. SGC_03 - Field crop system operation adapted to areas with a high proportion of vegetable or industrial crops. Support the change of practices in large vegetable and industrial crops at the scale of the operating system and improve environmental performance in the long term[11]. One of the secondary targets of this TO is to limit the decrease in pollinator population. One of the secondary targets of this TO is to limit the decrease in pollinator population.
	Whether to support the creation, restoration and biodiversity-friendly management of hedges, trees and wood patches through the AECM.	Five TOs specifically target the maintenance and creation of ecological corridors for wild fauna including insects on which no phytosanitary products can be used. Aging and decaying hedges are also protected for their specific role in providing insect habitats (LINEA 9). LINEA_01 - Maintenance of localized hedges in a relevant way. Ensure the maintenance of localized hedges with regard to the environmental issue. Ensure ecological corridors. Establish and implement a management plan, prohibition of phytosanitary products. LINEA_02 - Maintenance of isolated or aligned trees. Ensure the maintenance of isolated or aligned trees with respect to the environmental issue. Ensure ecological corridors. Establish and implement a management plan, prohibition of phytosanitary products. LINEA_03 - Maintenance of riverine forest. Ensure the maintenance of the riverine forests regarding environmental issue in order to ensure the sustainability of the environment. Ensure

[11] "Les projets mobilisant cette opération devront cibler en priorité les territoires à enjeu eau mais également prendre en compte les autres enjeux territorialisés, qu'il s'agisse de la préservation de la biodiversité ordinaire (déficit d'IAE, absence de diversité culturale, disparition des plantes messicoles, des auxiliaires et des pollinisateurs) ou de la qualité des sols (zones de limons pauvres en matière organique)."

		ecological corridors. Establish and implement a management plan, prohibition of phytosanitary products. LINEA_04 - Maintenance of groves. Ensure the maintenance of groves with respect to the environmental issue in order to ensure the sustainability of the environment. Ensure ecological corridors. Establish and implement a management plan, prohibition of phytosanitary products. LINEA_09 - Maintenance of tree hedges. Maintain aging and decaying hedges located in the hedge areas. Maintain an ecosystem, living space, shelter and breeding place of species.
	Whether to offer AECM for the creation and maintenance of wildlife fallow, e.g. through natural regeneration over a year or more or with wild seed mixes for pollinators.	Two TOs specifically target the maintenance, improvement and creation of fallows and perennial herbaceous covers by adapting the cover to species requirements. One of them explicitly mentions pollinators (COUVER_08). COUVER_06 - Creation and maintenance of a perennial herbaceous cover (grass strips or plots). Creation of perennial herbaceous cover over the 5 years of commitment, located in a relevant way. Respect the authorized covers and the minimal width (both locally defined). COUVER_08 - Improvement of fallows. Improve fallow location and choice of cover to meet requirements of a specie or group of species[12]. Criteria for location, maintenance of the covered surface over 5 years (depending on the territories, move are possible), and respect of the maintenance period without mechanic intervention, prohibition of phytosanitary products and fertilisers (limitation or prohibition).

[12] « L'objectif de cette opération vise à inciter les exploitants agricoles à améliorer la localisation de leurs parcelles en jachère agricole ainsi que le choix des couverts à y implanter sur les territoires à enjeu biodiversité pour répondre aux exigences spécifiques : d'une espèce, d'un groupe d'espèces, aux insectes pollinisateurs et auxiliaires de cultures »

	Whether to program AECM for restoration and maintenance of grazed heath and scrub habitats.	Five TOs specifically target the restoration or the maintenance of the open character of grazed heath and scrub habitats to conserve a pastoral activity in biodiversity rich areas. OUVERT_01 - Opening of an abandoned environment. Reopen plots to restore animal and plant biodiversity. Can be used to rejuvenate heathland type habitats. Intended to be maintained in grass cover: natural meadows, rangelands, heath. OUVERT_02 - Maintain openness by mechanical / manual removal of woody and unwanted vegetation. Maintain the openness of plots with shrubland expansion when the pasture is not sufficient using mechanical or manual removal. OUVERT_03 - Maintain Opening by Burning or Prescribed Burning. Maintain the opening of plots with shrubland expansion using burning. HERBE_10 - Management of lawns and heath in undergrowth. Maintain natural habitats related to lawns, heathland, undergrowth and maintenance of specific habitats related to tree cover (insects, bats). Commitment includes maintaining balance between herbaceous and tree covers by manual and / or mechanical interventions to allow the accessibility by animals. Establish and implement a maintenance plan, respect of periods of cover maintenance, prohibition of tillage, prohibition of phytosanitary products GARD_02 - Accompanying agro-pastoral activities in areas of high environmental value. Maintain agro-pastoral activity in a zone with high environmental value (i.e. Natura 2000 zone) which contributes to the maintenance of open environment and grassland systems favourable to biodiversity.

	Additional TO targeting domestic bees : *API - Improving the pollinating potential of bees*	Change in apicultural practices[13]. Strengthen the wealth of biodiversity and the production of resources and habitats. Various criteria of eligibility including the set-up of 1 to 4 colonies in "area of interest for biodiversity", a minimal and maximum number of beehives per colony (between 24 and 47), a minimal distance of 2.5km between colonies to limit pression on resources. Area of interest for Biodiversity are defined at regional level. For instance, in the Champagne-Ardennes Region, this definition includes Natura 2000 area, regional national parks and ZNIEFF zone (Natural Zone of Interest for Ecology, Flora and Fauna).
Organic farming support	*Whether pollinator conservation is mentioned as a reason for supporting organic farming.*	The conversion to practices and methods of organic farming is supported under M11.1 at national level. According to the national RDP, this measure targets the environment in general, including water, soil, biodiversity and climate change. The maintenance of organic farming is only supported in some Regions.
Other RDP measures	*Whether to programme the RDP measures for agroforestry forest conservation, and environmental afforestation* *Whether to offer forest restoration support for the conversion of closed coniferous stands to open mixed deciduous forest.*	The three RDPs under study little mentioned pollinators in other measures. Still it should be noted that : - in Centre Val-de-Loire, the decrease of pollinators is listed in the SWOT analysis as one of the important threats - in Aquitaine, the decrease of pollinators is also mentioned as a threat under a biodiversity section - in Midi-Pyrénées, under the M8.2 (Support in setting up and maintaining agroforestry systems), it is mentioned that local species and varieties should be favoured, as well

[13] « Cette opération consiste à maintenir sur l'exploitation un nombre de colonies d'abeilles (ruches), à faire évoluer la localisation de leurs emplacements au profit de zones dites «intéressantes pour la biodiversité», ainsi qu'à améliorer leur répartition en augmentant le nombre d'emplacements, afin de limiter la pression exercée sur la ressource.»

		as those that are favourable to biodiversity with as example **"those that provide pollinators with food resources".**
GAEC rules	*Whether to protect buffer strips through cross-compliance by listing them under GAEC 7 (beyond what is legally required by Water Framework Directive rules and/or nitrate action plan rules).* *Whether to protect hedges, trees and tree patches from destruction by listing them as landscape features under cross-compliance GAEC 7, and whether any additional conditions are defined that might benefit pollinators.*	GAEC 1. Indirectly buffer strips **foster natural enemy species and biodiversity**. Moreover, mix of species in the cover is recommended. Mineral and organic fertilizers and PPP is forbidden. GAEC 4: the presence of cover crop can have positive effect also on pollinators. GAEC 7 requires the maintenance of hedges, ponds and groves. Trimming of hedges and trees is forbidden between 1st April and the 31st July. SMR 1 - some measures promoted can be beneficial for pollinators (e.g. vegetal cover along watercourses and water points of more than 10 ha, vegetal cover during rainy periods). SMR 2 & 3 - the respect of protection measures of wild bird habitats such as no destruction of hollow trees, terraces, low walls and other elements not included in GAEC 7. No cut of trees between 1st April and 31st July can also be beneficial for pollinators. Respect of protection measure of natural habitats and species on Natura 2000 areas (especially, authorisation procedures for some manifestations and intervention in Natura 2000 areas). SMR 10 – Use of PPPs: The condition of application of the pesticide product (including as regards pollinators protection) need to be respected. A non-treated zone of 5m width minimum must be installed around water points.
Greening: permanent grassland rules	*Whether to protect permanent grassland from ploughing completely by designating it as ESPG*	In France, **ESPG** only encompass some grassland within N2000 area.

		The designation of the ESPG was first larger and guided by a scientific study on important areas in terms of biodiversity (conducted by the French Natural History Museum). But after economic and political consideration, the Ministry of Agriculture decided to limit the ESPG within N2000 area. The ESPG are listed in Article 3 of French Arrêté from 12 November 2015 and concern: - Land declared in 2014 as rough grazing and mountain pastures, localized in Natura 2000 areas (629 000 ha) - Natural meadows located in Natura 2000 areas in the zone which have been identified as of particular interest in terms of biodiversity according to a study by the Natural History Museum i.e. with "une richesse de biodiversité" (482000 ha[14]). It is built on the Bird and the Habitat Directives. As regards the Habitat Directive, the MNHN has selected these areas based on the presence of a selection of species and habitats from those listed in the Annex to the Directive. This selection is based on a technical report produced by the European Environment Agency in collaboration with the European Commission and published in 2010 on the monitoring of trends in terms of biodiversity. The detailed method used to define these areas is provided in Annex. Finally, 85% of the N2000 grassland listed in Annex1 of the Habitat Directive is considered as ESPG representing only 45% of the total area of grassland listed in this Annex 1 (encompassing N2000 area and area outside N2000)[15].

[14] APCA, Fiche verdissement 2015

[15] Alliance Environnement, Evaluation study of the payment for agricultural practices beneficial for the climate and the environment, 2017

		The **permanent grassland ratio** is controlled at regional level. In order to better control this ratio, since 2016, a prior authorization regime should be applied in Regions where the permanent grassland ratio decrease by more than 2,5%. In this case, the prefect of the region sets each year the maximal hectares of permanents grassland that can be ploughed (Article 1 of the French Decree from November 10th,2016) and ploughing is subject to prior authorisation accordingly. If the ratio of 5% of permanent grassland decrease is exceeded, a ban regime is applied. The ministry in charge of Agriculture stipulates by a decree the percentage to achieve before the next CAP campaign. Farmers who have ploughed permanent grassland without authorization (if this system were in placed) during the last two years have to sow again 100% of the areas. If necessary, farmers who have ploughed permanent grassland with authorization might also have to sow again permanent grassland.
Ecological Focus Areas	*Was the pesticide ban on nitrogen-fixing crops communicated as being good for pollinators and were pollinator-friendly N-fixing crops included?* *Whether to allow hedge, tree and tree patch landscape features to count towards the greening EFA requirements.* *Whether to allow fallow with naturally developed vegetation to count towards the greening EFA requirements*	The French Ministry of Agriculture (in coordination with other stakeholders) decided to make available a large panel of Ecological focus areas (EFA) to farmers in order to consider the diversity of agriculture situations in the Regions. As a result, all the potential EFA elements from EU Regulation are eligible. The new EFA flowering fallow were also introduced in 2018. The French Ministry choose to apply both weighting and conversion factors for EFA (they are provided in Annexes). However, it was decided not to offer the possibility to have collective EFA, nor equivalent practices. It should be noted that the weighting factors particularly encourage the use of EFA landscape feature. For instance, one linear meter of hedge is equivalent to 10m² of EFA, while 1m² of nitrogen-fixing crops is equivalent to 0.7m² of EFA. The EFA flowering fallow (equivalent to 1.5 equivalent EFA) is also more favourable than classical land laying fallow (1 equivalent EFA). The list of species that can be sown in EFA flowering fallow is provided in the annexes (Table 4). It should be noted that this distinction of flowering fallow (and its advantageous coefficient) existed in France before 2015 as part of cross-compliance under GAEC 7 on the mainte-

	Whether to allow forest edges, short rotation coppice, agroforestry and environmental afforestation to count towards the greening EFA requirements.	nance of landscape features. It disappears in 2015 with the new CAP and has been reintroduced in 2018 after farmers' and beekeepers' representatives voice their displeasure and the negative effect of this withdrawal. Some of the EFA landscape features are protected under cross-compliance (hedges, copses and ponds). However, the way these features are defined can change between the two Regulations. For instance, edge can be up to 10 m wide under EFA whereas under GAEC7 they can be from 2 to 20m. A regards pesticide use, the choice was made not to restrict management practices (except for short rotation coppice). This choice was justified by the difficult controllability of management practices. However, the pesticide ban on EFAs was finally implemented in 2017 (as required by the European Framework). No specific communication on pollinators as been reported.
Pillar 1 eligibility rules	*Whether the Member State has chosen to extend its definition of "permanent grassland" to include other land on which traditional grazing practices take place.* *Whether the MS has chosen to protect grassland from ploughing without re-seeding, and from con-*	EU Regulation establishes rules for the maintenance of a minimum activity of farmers receiving direct payments. The French implementation stated that any eligible land has to be managed by an active farmer defined as follows: an active farmer carries an agricultural activity (Article L 311-1 of the Rural Code). In addition, since 2015, the heaths and rangeland, used as pastures land but where grass cover is not dominant, are eligible to direct payments, providing that the agricultural parcel is suitable for grazing. The fact that a parcel is suitable for grazing has to be confirmed by the presence of clusters of clues[16]. In fact, France decided to extend the definition of permanent grassland to other pastures, with predominance of non-herbaceous elements. It includes

[16] Ministry of Food and Agriculture and Payment and Services Agency (ASP), Guide national d'aide à la déclaration du taux d'admissibilité des prairies et pâturages permanents, 2018

	version to arable, by defining "permanent grassland" to include traditionally grazed areas. *Whether to define the eligibility rules for wooded agricultural land to help support the viability of wood pasture farming systems*	grasses and ligneous type of grazable vegetation and is implemented using a pro rata system. Under this system, each pasture is attributed with a percentage representing the share of grazable area (detailed in Annexes). This percentage thus makes it possible to exclude ineligible features such as rocks, no grazable trees, etc. A typology of ligneous element grazable taking into account the width and height of the bushes and a national list of inedible species have been established to exclude non grazable elements (inaccessible bushes for instance). Farmers had to declared a pro rata in 2014 which has been validated based on satellite imagery. When satellite imageries were not sufficient to validate the pro rata proposed by the farmers (e.g., percentage of grazable area under forest), on-field controls have been carried out.

Part 2: Advice made available to land managers to help them encourage pollinators

As explained in Part 1, the FAS has no impact on the way advises are provided to farmers and M1 and M2 have been little used in Regions. Moreover, when they have been used it was mostly to finance already existing advisory system. Therefore, this section focuses on existing advisory system in France.

Currently, various organisations provide advisory services to farmers:

- The Chambers of Agriculture (organised in national, regional and county level organisation): they are consular organisations chaired by a president (elected farmers) and a board of farmers' representative but they also have public missions and are partly financed with public subsidies.
- Farmers' cooperatives and private traders: they are mostly important economic organisation that provide advisory services while selling input and buying the production;
- Farmers' associations of different size that can be supported by private counsellors, researchers, or even Chamber of Agriculture.
- Industrials especially in case of high-quality value chains or of highly integrated value chains.

Each Chamber of Agriculture have a department in charge of the promotion of practices beneficial for the Biodiversity. They can offer various services such as:

- Farm diagnosis: to identify main challenges related to biodiversity on the farm
- Management advices: to diversify their crop system, to improve grassland quality, to adapt their mowing practices, etc.
- Experimentation: for farmers welling to engage innovative practices and to participate to data collection.

The section below focuses on how Chambers of Agriculture address pollinators protection in their programs. It also presents an example of local project targeting pollinators protection with observable output lead by a farmers' association and supported by a value chain.

As part of these services, some actions/programs specifically focussed on pollinators. Besides national orientations, each Chamber of Agriculture can implement its own action program thus the offer of advisory service depends on the Chamber considered. A report has been published by the National Assembly of Chambers of Agriculture in 2015 on the state of play of actions in favour of Biodiversity supported by the Chamber of Agriculture in the regions based on a systemic survey. This report shows that actions in favour of pollinators has been carry out by Chamber of Agriculture in 7 Regions (out of the 19 under study). However, it should be noted that since this report, the situation has improved since new actions have been implemented in the Regions (e.g., in Occitanic (Midi-Pyrénées), the Chamber of Agriculture is now offering a training on apiculture and agriculture and they are cooperating with project to promote the conservation and the reintroduction of messicole plants). The table below presents examples of such actions provided by some Chambers of Agriculture in relation to pollinator protection.

Table 2: Example of advisory services provided by Chambers of agriculture

Type of action	**Action**
Experiments	Experiments on flowering fallows (Chamber of agriculture of Eure) Installation of a fallow bee trial: implantation of different flowers source of nectar and monitoring of wild bees (Chamber of Nord pas de Calais and Picardie)
Fields visits	Fields visit on functional biodiversity specific for pollinators (Chambers of Agriculture of Pays de Loire) Organization of a study trip farmers / beekeepers in another Region (Chamber of agriculture of Seine Maritime)
Meeting/ network	Organisation of meeting between farmers and beekeepers (Chamber of agriculture of Seine Maritime)

	Organisation and support of a mixed farmers / beekeepers network (Chamber of Aisne)
Specific communication	Pollinator Protection Communication. (Chamber of agriculture of Seine Maritime)
Restoration/ Mange-ment	Management and restoration of the edges of fields and feet of pylons included follow of pollinators in partnership with the Association "Hommes et territoires" inside the "Agrifaune" Program (Chambers of Centre Val-de-Loire)

Source: Boite à outils des Chambres d'Agriculture – Biodiversité, APCA, 2015[17]

According to interviewees, it is difficult to say which of these actions is the most effective to convince farmers to take actions in favour of pollinators. It is probably the combination of actions that can lead farmers to change their practices. An example of global action plan to protect pollinators undertaken by a farmers' association as part of a value chain initiative is presented in the box below.

In addition to these regional initiatives, some operations to promote pollinators protection has been carried out at national level. For instance, in 2018, a notice on why and how to protect pollinators in agriculture has been written in collaboration with various institutions including the Minister of Agriculture, the National Assembly of Chamber of Agricultures and the Technical Institute on Pollinators and Apiculture[18]. This note has been widely relayed on field especially through the regional "Bulletin de Santé du Végétal", i.e. bulletins that are periodically send to farmers to provide a state of play of the pest development at regional level.

Box: The Apisoja initiative within the Sojadoc interbranch association in Southwest France

Sojadoc is a French interbranch association founded in 1994 to organise GM-Free soya bean production in Southwest France. It brings together 4 collectors (two cooperatives and two traders, two are organic and two conventional) and one processor (Nutrition and Nature) and around 500 farmers. It was first established to create the very first GM-free soya bean food

[17] https://chambres-agriculture.fr/fileadmin/user_upload/National/FAL_commun/publications/National/Casdar/Boite_outil_biodiversite.pdf

[18] http://draaf.normandie.agriculture.gouv.fr/IMG/pdf/Note_nationale_abeilles_et_pollinisateurs_2018_v12_def_cle817a9c.pdf

value chain in France but over the past 25 years the association opened its areas of intervention to other topics such as: life cycle analysis, support for agri-environmental measures, certification of organic production in the Fair-Trade standard, and finally the development of activities to better account for biodiversity and pollinators in the farm.

Because soybean is not attractive for pollinators, a reflexion was launched in 2014 to think about ways to better host pollinators on soybean producers' farms. In 2015, two groups of motivated farmers were formed to initiate the work on that subject. A tool was first built to assess the level of "friendliness" of each farm at the starting point and to identify opportunities for progress. An individual report was then presented to farmers along with first recommendations. Collective formations have then been offered to farmers on how to better protect pollinators. In addition, a guide has been created and diffuse to farmers with technical, economic and regulatory information on the practices beneficial for pollinator protection. A specific section on the supports provided by the CAP and on the related requirements is also provided in this guide. Finally, the first collective action was to experiment the possibility to increase the floristic diversity of their fallow and strips along their plots. The action began in summer 2018 and around 40ha of fallow and strips will be sown or enriched in species appealing for pollinators before winter 2019. The groups of farmers have received the French GIEE label attesting that they are working to improve the economic and ecologic sustainability of the farms. Thanks to this label, they received regional found (independent from the CAP) to support their actions and the animation of the project. They have also been supported by the Sojadoc Association and the initiative is now promoted at industrial level.

For the future, the project will continue to promote collective actions and to experiment practices beneficial for the pollinators. It will also work more in collaboration with beekeeper for instance by installing pedagogic beehives on farms. The hypothesis is that if farmers better understand the life cycle and needs of bees and if they have bees on their farms, they will fell more responsible and presumably more inclined to implement actions to protect pollinators in general. The objective is also to diffuse the project and the action beyond the initial group of "motivated" producers. One of the collectors of the interbranch is already using the diagnostic tool with farmers that were not part of the project at its start (some of them do not even produce soybean).

Source: Apisoja project animator

Part 3: Impact of including or excluding traditionally grazed heathlands or scrub as "permanent grassland".

The definition of permanent grassland, encompassing extensive area like heath, rangeland and scrublands has been selected in France to preserve and maintain traditional grazing, in order to prevent the decline of extensive farming systems in rural and deprived areas with natural constraints. It concerns especially extensive and pastorals systems with high geographical constraints, inducing high structural and operating costs. Most of the surfaces concerned by the lower pro

rata system are located in surfaces where intensification is rarely possible (mountains areas with steep slopes where mechanisation is not possible, pastorals surfaces with poor grounds inconsistent with cultures in Causses for instance). The support to this type of surfaces helps to maintain farmers activity. Without it, semi natural habitats listed in the Annex 1 of Habitats Directive could have disappeared because of the absence of grazing and the impossibility of a mechanical maintenance (steep slopes, zones very difficult to access except by foot). However, it should be noted that in many cases (according to interviews), if abandoned they are more likely to be replaced by forest than by arable land. Forests house a smaller diversity of pollinators than semi-natural habitats.

The eligibility rules of the first pillar concerning the "maintenance" and "minimum activity" described in Part 1 are applied to the farmer but not to the land itself. This absence of minimum activity criteria on the parcel could have led to its possible abandon. However, the pro rata system applied to the heath, rangeland and meadows (described in Part 1) seems to enhance the keeping of a land with the higher pro rata possible, encouraging the management of the land[19]. Therefore, this definition of permanent grassland encourages maintaining semi natural habitats, favourable to biodiversity and pollinators. However, in order to keep the ratio as high as they can, farmers can end up in removing any ineligible area according to this ratio such as non-grazable small wood plot or groves limiting the diversity on field. But this phenomenon has not been measured. In addition, the definition of permanent grassland does not take into account their floristic diversity. According to an interviewee[20] in charge of the national action plan on wild pollinators, this could lead to the presence of permanent meadows with 100% of the surface eligible whose floristic composition is not suitable for feeding most of the pollinators (for example, meadows composed mostly of grasses are not pollinated by butterflies).

This new definition of permanent grassland is not the only CAP mechanism with positive effect on little intensive permanent grassland. Indeed, the convergence mechanism often favor these areas that historically received less direct payments. Moreover, in France, according to interviews, the ANC measure mostly favor

[19] Country report on the implementation of the new CAP and its possible effects on permanents pastures, Poux, 2015

[20] Interview with Serge Gadoum, in charge of the National Action Plan on wild Pollinators, OPIE, 28th of May 2019

mountain area and little intensive farms. As regards AECM measures, according to interviews, they can be beneficial to support the maintenance of extensive livestock production and therefore of permanent grassland in area not suitable for arable farming in addition to other supports.

Finally, the definition of grassland, encompassing heath and scrubland, together with other supports, help to maintain the use of these low productive pastures which are important breeding and foraging habitats for many pollinators (included some threatened bumblebees and many solitary bee species totally dependent on these habitats), and requires regular maintenance (eg. grazing by livestock) to maintain its status. According to the project officer of a professional agricultural association acting in the Pyrénées Mountains, the attractiveness of these little intensive systems in the agricultural sector has been enhanced thanks to these various supports and land abandonment is limited. However, in area that can be ploughed and converted into arable land, the level of support appears to be not sufficient to protect grasslands. This is for instance the case in Hauts-de-France, Normandie, Britany or Lorraine Regions where permanent grassland are ploughed every year.

Box: Focus on the specificity of estivale collective pastures and basic payment entitlements

In France, upland mountain pastures are mostly used in summer and managed collectively. While the new CAP fully recognizes collective pastures as areas of agricultural production, the specificity of collective management has required specific rules as regards basic payments entitlements.

The surfaces are first declared by the collective organisation in charge of the management of these lands. The corresponding surfaces are then divided between farmers using this land in 2015 according to their number of livestock and the period they were in these collective areas. To activate entitlements on these common pastures, each year, each farmer reports again the area used, the number of animals actually grazing it and the duration of grazing. In case of reduced livestock and / or reduced period on these surfaces, the farmer cannot activate all its entitlements. After 2 years without activation, those are definitely lost and added to a national reserve. Without transfer of entitlements, the decrease in basic payment entitlements for pastoral systems therefore seemed inevitable.

In this context, in order not to lost entitlements, farmers can give their right to other farmers within collective management of pasture associations[21]. For instance, local stakeholders of

[21] http://www.isere.gouv.fr/content/download/40437/287712/file/RPB-2019_clause-C_estives.pdf

Hautes-Pyrénées together with the administration have put in place a management charter that to ensure that each year, basic payments entitlements are transferred between farmers.

Part 4: The effectiveness of actions and schemes deliberately intended to help pollinators

M1 and M2

M1 and M2 have been little programmed in regional RDPs and when programmed their implementation has been limited due to administrative burden issue. Indeed, the requirement to select counsellor organisms in line with public market rules to benefit from M2 supports limits the applicability of M2. This requirement had been deleted in the Omnibus regulation. But except in overseas departments (DOM-TOM in French), the Ministry believed that few regions will use this measure since programming has already been done. M1 has also been reported as sometimes difficult to implement since regions have to use calls for tender and beneficiaries have to provide many written proofs to the EC to receive the support. In the previous programming period, some actions have not been financed afterwards due to lack of proper supporting documents. Also, for some projects the issue is the timing of the call of tender. Indeed, for some projects the call for tender is published too early in the year (the project is not advanced enough to provide all the information necessary to apply) or too late (the training activities have already been done). As a result, training programs and information sharing have mostly been supported by regional or private funds (see Part 2 and Part 4.6).

AECM

The AECM measure is one of the main tools (together use the organic farming measure) implementing to support biodiversity preservation. As shown in Part 1, many TOs have been introduced with the objective to protect biodiversity in general but also pollinators and floral resource.

The description of these TOs with direct or indirect impact on pollinators is included in Part1. It should be noted that in France, a main novelty of the new programming period for the second pillar has been the transfer of the RDP management from the State to the Regions. This reflects a general will of the government at the time for more decentralised policy implementation, it did not have any

environmental objective. However, this transfer has been associated with a new governance for agri-environmental schemes, which could have improved their targeting and effectiveness. On priority areas identified by the regions, AEC projects (AECPs) were expected to be co-designed and co-managed by diverse local stakeholders. In practice however, a study (Gaudefroy 2018) observed that agricultural organisations were still influencing strongly the implementation of AECMs, reducing their effectiveness on biodiversity (and on other environmental objectives). In Centre-Val-de-Loire, the Region promoted a co-management of AECPs by environmental and agricultural organisations, avoiding this weakness but according to regional authorities the case of pollinators were not specifically discussed. The stakeholders however often mentioned they lacked time to properly implement, monitor and assess the AECPs, which may reduce their effectiveness. Moreover, available TO are defined in the national RDP and thus AECM are sometimes mentioned by local stakeholders as too rigid to be adapted to the local context.

Administrative issues related to the implementation of AECM and of the 2014-2010 CAP in general impeded their implementation. The decentralisation has indeed been only partially implemented: although the Regions have become managing authorities, they should still comply with a quite detailed national framework, and the controls and payment are still made by state services. In addition, due to several problems (see box below) the RDP payments have suffered for considerable delays, about 2-3 years, which had a strong negative impact on farmers' perception.

Box: Delays in the payment of AECM and organic farming measures in 2015-2018

The years 2015, 2016 and 2017 were marked in France by major difficulties in the implementation of the CAP. Many demands for RDP measures made by farmers in 2015 have been paid in 2018 and some demands made in 2016 and 2017 have not been processed nor payed yet. Two RDP measures were particularly affected by these delays: the AECMs and the support to organic farming.

The Managing Authorities are currently resolving this situation and the CAP payment should follow a normal agenda for the following years. These delays have weighed on farms' economic balance and led to huge cash flow loss for many farms. Repayable cash inflow system (ATR, in French) have been established, and, for a transitional period, the computer systems of control have been simplified.

The delays in control have also led to cases where farmers were informed 2 years later that they were not compliant with the rules of a measure (sometimes due to a mistake or a misunderstanding of the rules) and should therefore refund the cash inflow received. Such situations drastically increase the mistrust of farmers with regard to voluntary measures.

Several factors have contributed to these difficulties (Cour des comptes, 2018):

The French system of instruction, monitoring and control was reviewed due to a sharp increase in refusals for European aid (due to various failures in their management) for the period 2008-2012. The ASP (Services and Payments Agency, in charge of the control of CAP supports) had to implement a new layer in the LPIS to show actual and potential EFA features (excluding cover and catch crop, fallow and nitrogen-fixing crops) on farm plots. The software used for the instruction and the control were also reviewed (a new software, ISIS, was designed).

The French regulations were defined and specified late (while the implementation phase had already taken place) and were complex (e.g., all the EFA options were selected by the French government).

The organisation of the monitoring and control services in complex and did not prove efficient. The organisation in charge, the Services and Payments Agency (ASP, in French), design the procedures and the software for this purpose. However, the actual instructions and controls are delegated to territorial administrations: the DDT (Direction départementale des territoires) in each county. This separation led to efficiency loss.

As explained in Part 3, the measures are not always attractive for farmers depending on their local and economic context (e.g. crops with high margin per hectare). Consequently, many farmers choose not to subscribe to these measures due to the low financial interest.

Another limitation sometimes mentioned is that the AECM would not enable to maintain beneficial practices over time. However, a study made in Alsace shows that only part of the benefice of the measure is lost when the payment stops, but this study mostly focused on water protection related AECM. In case of pollinators, we can expect indirect positive effect on production and thus a better conservation of practices even when the payment stops. The effect of flowering strips on field is a particularly interested example to that respect. It is already used by some farmers in France. But it is mainly by farmers producing seeds and thus that in the same time use quite important volumes of phytosanitary products. There is no information on the extent to which AECMs promote this practice among other farmers.

About the level of take up of the AECM measure, the only data obtained in the framework of this study at the level of the TO are data in the centre Val-de-Loire Region. They show that 35 out of the 44 TOs identified as directly or indirectly related to pollinators protection has been programmed in that Region and that only one of them has not been subscribed by any farmer. 603873ha[22] were subscribed under these TOs over the period 2015-2018 by 2128 farmers (10% of the farmers). The detail data for each TOs are presented in Annexes.

The table below shows that around half of the farmers engaged with AECM related to pollinators subscribe TOs supporting biodiversity-friendly grassland management. Then, they are mostly engaged with TOs supporting the creation of pollinators border and strips on arable land, the creation and maintenance of wildlife fallow and integrated pest management.

Type of AECM	**Number of farmers**
TOs linked with biodiversity-friendly grassland management practices	978
TOs linked with the creation of pollinator borders or strips on arable land	337
TOs linked with Integrated Pest Management and reduced pesticide use	266
TOs linked with the creation, restoration and biodiversity-friendly management of hedges, trees and wood patches through the AECM.	165
TOs linked with the creation and maintenance of wildlife fallow	346
TOs linked with the restoration and maintenance of grazed heath and scrub habitats.	46

[22] If an area has been subscribed under many TOs or if a farmers subscribed many times they are counted many time (eg. if an area has been subscribed under two TOs it is counted twice).

AECM support for apiculture	6

The table below only considers the measures that explicitly mentioned pollinators protection in their description and/or objectives. It shows that a very small proportion of farmers subscribed these measures: around 2% (435 farms out of 20992) and that most of them subscribed to COUVER 07 for the creation and maintenance of cover of floristic and faunistic interest. In a context where interviews reveal that most of the AECM are little attractive to farmers because little remunerative, it should be noted that this TO is one of the TOs with the highest authorised level of support in France (560€/ha/year). The type of cover to be sown under this measure is defined at local level in territories responsible for PAECs. As examples, two lists of authorized cover in two territories in Centre-Val-de-Loire are presented in Annexes.

Relevant TO	**Number of farmers**	**Area (in ha, lm or elements)**	**Total expenditure**
COUVER_05 - Creation and maintenance of a network of ecological regulation areas	3	3.15	1,146.19 €
COUVER_07 - Creation and maintenance of cover of floristic or faunistic interest	334	2,275.91	1,271,889.34 €
SGC_01 - Field Cropping Systems Operation	84	11,604.89	1,651,599.31 €
SGC_02 - Field crop system operation adapted to intermediate areas			
SGC_03 - Field crop system operation adapted to areas with a high proportion of vegetable or industrial crops			

COUVER_08 - Improvement of fallows	14	37.81	5,545.21 €
API - Improving the pollinating potential of bees	46	13,756	288,876.00 €

The TO API has the objectives to maintain a certain number of bee colonies and to protect biodiversity in the same time. Indeed, some eligibility criteria ask for a minimum number of colonies with at least 4 of them to be in "areas of interest for biodiversity" to promote the pollination service in these areas. Then, to limit competition with wild pollinators, a maximum number of 47 beehives per colonies is set as well as a minimum distance of 2.5m between colonies. These last criteria limit to some extent the competition with wild pollinators but competition still exist. According to interviewees, it is especially problematic because part of the colonies need be in areas of interest for biodiversity defined at regional level such as Regional Natural Park, Natura 2000 area or ZNIEFF zone (Natural Zone of Interest for Ecology, Flora and Fauna). According to interviews, this requirement has been introduced to guarantee that beekeepers are not supported for actions that they would normally implement (to limit deadweight effects) but is not really relevant to protect wild pollinators.

EFA Flowering fallow

As mentioned in Part 1, the flowering fallow (and its advantageous coefficient) existed in France before 2015 as part of cross-compliance under GAEC 7 on the maintenance of landscape features. It disappears in 2015 with the new CAP and has been reintroduced in 2018 after farmers' and beekeepers' representatives voice their displeasure and the negative effect of this withdrawal. According to representatives of the French association for the promotion of melliferous land laying fallow, a collapse in the surface covering by flowering fallow was observed between 2015 and 2016. As an example, it was reported that a seed supplier specialised in melliferous plants lost 20% of its markets between these two years.

The incentive to sow flowering fallow has been reintroduced in 2018 under the EFA measure. But it seems that it had little impact on the area of flowering fallow since only 2761ha (around 0.8% of the fallow area) was declared in 2018 as

land laying fallow melliferous under the EFA measure. According to the association for the promotion of melliferous land laying fallow, "all the work made to promote melliferous fallow during the last programming period needs to be done again" to inform farmers that this EFA has been added to the list and to convince them to use it. It should be noted that other EFAs that can have beneficial effect for pollinators exists such as alfalfa production or cover crop production but that there is no incentive to promote flowering (e.g., to let a strip non-harvested on alfalfa plots, to select flowering cover crops, etc.).

M8.2: Support in setting up and maintaining agroforestry systems (Occitanie)

In Midi-Pyrénées (Occitanie), under the M8.2 (Support in setting up and maintaining agroforestry systems), it is mentioned that local species and varieties should be favoured, as well as those that are favourable to biodiversity with as example "those that provide pollinators with food resources". However, no data have been provided on the effectiveness of this measure to protect pollinators. According to stakeholder, the uptake of this measure is quite low.

Other national or local measures and actions

Green and blue corridors initiative («Dispositif Trames Vertes et Bleues ») (FR)

The green and blue corridors initiative ("dispositif de **Trames Vertes et Bleues**") aims to maintain and rebuild a network allowing animal and vegetal species to circulate, feed, reproduce, rest, etc. by integrating biodiversity in the land use planning at national, regional and local level.

A national program gives the global framework of the policy that is then declined at Regional level. But this policy is based on the principle of subsidiarity and it is at local level that the corridors are identified and protected in SCOT (plan for the development of territories build at local level gathering various municipalities) and PLU (local urbanization plan build at municipality level).

Both urban and rural territories are concerned by the protection of these corridors. In agricultural area, it encompasses the protection of landscape feature (hedge, isolated trees, ponds, wetland, etc.) and of strips within and around fields

(eg. buffer strips). Different tools can be used to protect these elements in agriculture as shown in a study aiming to guide collectivities to support the protection of these corridors in rural areas[23]. First, contractual tools can be used such as AECM. The link between AECM and the protection of green and blue corridors is made explicit in national RDP but also in regional ones. Then, some features can be protected via regulatory tools. For instance, cross-compliance is used at national level to protect buffer strips and landscape features. At municipality level, some elements identified as of special interest (e.g. Isolated tree, hedges, wetland, etc.) can be delineate and protected in the PLU. Then if someone wants to remove one of these protected elements, he has to obtain an authorization from the local authorities.[24] It should be noted that the elements protected under the green and blue corridor in agricultural area are also often elements that can be declared as EFA. Thus many rules and tools exist to protect a same or similar elements in agricultural area. Even if cross-references between these rules and tools are often made in the texts, they have been built quite independently and are based on different logics. According to some interviews, the multiplicity of rules and tools existing to support some of these elements has been quite effective in protecting them even if it is difficult to say which policy has been the more effective. However, according to others, this multiplicity of rules is source of complexity for farmers that often feel lost as they do not always know what they can do or not on their field (eg. if and how there can move or remove some elements).

Ecophyto Plan

Ecophyto is a French initiative from the Ministry of Agriculture which aims to reduce the use of pesticides while maintaining economic performance and production. The program was launched in 2008 as a result of a French environmental summit (The "Grenelle de l'environnement") and initially aimed to divide by 50% the use of phytosanitary products by 2018. This objective has not been reached and a new plan has been launched with a more attainable objective to reduce by 50% the use of phytosanitary products by 2025.

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[23] http://www.trameverteetbleue.fr/sites/default/files/references_bibliographiques/rapport_tvb_agri_22dec2010.pdf

[24] Alliance Environnement, Evaluation study of the payment for agricultural practices beneficial for the climate and the environment , Case study report for France, 2017

In practice, different tools are offered within Ecophyto 2 to achieve this objective, for instance:

- farmers have to pass an individual certificate for the sustainable use of pesticides,
- a network of pilot farms was established in order to identify sustainable practices,
- a regional newsletter (the bulletin of plant health) is periodically produced in collaboration with Chamber of Agriculture in order to alert farmers in case of pest attack to limit the use of systematic treatments,
- regular field sprayer controls are mandatory/

It should be noted that the obtention of the individual certificate as well as of the certificate of field sprayer control have been included in national cross-compliance rules and are controlled as part of it.

GIEE

A GIEE ("Groupements d'Intéret Economiques et Environmentaux") is a group of farmers working together on a common multi-years project to increase the environmental, economic and social performance of their farms. In 2019, 527 GIEEs had already been created in France. The creation of GIEE can be supported through RDP in some regions. They are often considered as operational groups to be supported under Measure 16 (e.g., in Aquitaine) and belonging to a GIEE have been chosen as an eligibility criteria, a selection criteria or a mark-up factor to calculate the amount of support in many RDPs.

These GIEE can have different objectives relates to biodiversity and few of them directly target pollinators protection (e.g., 2 out of 103 in Occitanie). Still some examples of GIEE targeting bees and/or wild bees protection can be highlighted. One project has been presented in Part 2 (the GIEE Apisoja). Another example is the GIEE Agrial to promote and use biodiversity in agricultural area in the Calvados county (Region Normandie). This GIEE particularly aimed at developing flowering strips on fields but also melliferous hedges or cover crops. It is supported by a cooperative (Agrial), a beekeeper association and an agricultural training institute. The project also tried to quantify the effects of the practices implemented thanks to a cooperation between farmers and beekeepers. Indeed,

the bees health and honey production are used as indicators of the nutritive potential of the area. This cooperation also aims at sensitizing farmers and beekeepers to their respective needs and constraints. No result has been quantified yet on pollinators. But the experiment shows that the diversity of carabid beetles increases with flowering strips. A guide with technical information on beneficial practices has been created. Finally, results of this experimentation will be use by the training institute to sensitize new farmers generations.

National competition for agroecological practices on grasslands and rangelands

This General Agriculture Contest aims among other things at "Valuing and renewing the agronomic and ecological qualities of flowering meadows". The hypothesis being this competition is that synergies exist between agronomic and ecological value of grass. For instance, a diversified grass rich in flowers often have higher nutritive value, attractiveness for livestock and in fine the milk and the meat can have higher gustative characteristics.

The evaluation criteria for grassland and rangeland are set regionally and a cluster of experts specialized in agronomy, zootechnics, fodder management, ecology, botany, beekeeping and wildlife is responsible for the evaluation on the plots.

Among other things, the experts:

- Assess the diversity of species and their extent;
- Rate the agro-ecological properties for instance in terms of land productivity, nutritional value, pollen and nectar richness, seasonality, etc.

In 2018, 257 farmers have participated, and 267 plots were analysed in 44 territories.

National competition for agroecological practices on agroforestry

In 2018-2019, the first edition of "Agro-ecological practices - Agroforestry" competition rewards agroforestry projects of all types (hedges, intra-plot alignments, pre-orchards) that have been in place for more than 5 years. As for the grassland

contest, a jury with regional experts assessed on plots farmers' practices. The criteria used to select the best plots include for instance tree diversity, biodiversity friendly practices, water retention capacity, production quality, etc.

The management of the contest has been partially supported by EAFRD through the Rural Development National Network.

These contests concern a very small proportion of French farmers and their effectiveness on pollinator protection has not been assessed. Nevertheless, according to interviews, it encourages the promotion and the development of habitats favourable to wild pollinators among farmers' communities.

Agrifaune program

The Agrifaune network brings together actors from agriculture and hunters. Since 2006, it has contributed to the development of agricultural practices that reconcile economy, agronomy, environment and wildlife. In more than 60 departments, many actions are implemented to promote wildlife without compromising the economic performance of farms such as sowing cover crops with beneficial mixture for wildlife, better managing field borders or adapting agricultural equipment.

For instance, as part of this program, the "Hommes et Territoires" association for the protection of the environment in Centre-Val-de-Loire, is supporting farmers to experiment new seeds mixture on field border that are beneficial for wild game but also for pollinators and auxiliaries. Sometimes, wild pollinators conservation is not the major concern of farmers. But since many farmers are also hunters, it has been decided in some regions to support pollinators conservation through the conservation of habitat for wild game. Indeed, some measures which are favourable for pollinators may be more readily taken up by stakeholders if they are presented as for hunting.

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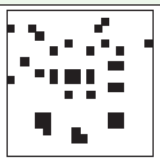
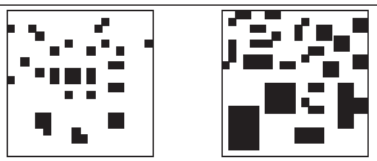
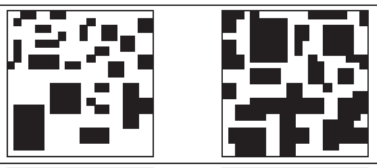
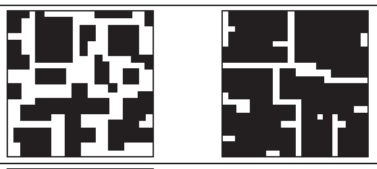
Annexes

National prorata matrix for permanent grasslands and pastures

Classe de prorata ou densité = Pourcentage de surface couverte par des éléments non admissibles diffus de moins de 10 ares *(sol nu, pierres, troncs et autres éléments non adaptés aux pâturages).*	Estimation visuelle du taux de recouvrement par des éléments non admissibles diffus de moins de 10 ares *(figurés en noir)*, correspondant à chaque catégorie de prorata.	Prorata retenu *(surface admissible).*
0-10 %		100 % 1 ha réel = 1 ha admissible
10-30 %		80 % 1,25 ha réel = 1 ha admissible
30-50 %		60 % 1,66 ha réel = 1 ha admissible
50-80 %		35 % 2,85 ha réels = 1 ha admissible
> 80 %		0 %

Source: Ministry of Food and Agriculture and Payments and Services Agency (ASP), Guide national d'aide à la déclaration du taux d'admissibilité des prairies et pâturages permanents, 2018

EFA options and requirements in France

EFA options	Sub-categories	Restrictive choice of species	Other conditions	Weighting and conversion factors
Land lying fallow	-	-	-	1m² = 1 m² EFA

Land lying flowering fallow		Details in figure 2		1m² = 1,5 m² EFA
Terraces	Since 2016	-	-	1 ml = 2 m² EFA
Land-scapes features	Hedges or wooded strips	-	-	1lm = 10 m² EFA
	Isolated trees	-	-	1 tree = 30 m² EFA
	Trees in line	-	-	1lm = 10 m² EFA
	Trees in group	-	-	1m² = 1.5 m² EFA
	Field margins	-	-	1lm = 9 m² EFA
	Ponds	-	-	1m² = 1.5 m² EFA
	Ditches	-	-	1lm = 6 m² EFA
	Tradi-tional stone walls.	-	With a height be-tween 0.5 and 2 meters and a width between 0.1 and 2 meters	1lm = 1 m² EFA
Buffer strips	-	-	With a width be-tween 5 and 10 meters. Cutting and grazing au-thorized	1lm = 9 m² EFA
Agro-for-estry		-	-	1m² = 1 m² EFA

Strips along forest edges	No. prod	-	-	1lm = 9 m^2 EFA
	prod	-	-	1lm = 1.8m^2 EFA
Short rotation coppice	-	• Erable sycomore • Aulne glutineux • Bouleau verruqueux • Charme • Châtaignier • Frêne commun • Merisier • Espèces du genre Peuplier • Espèces du genre Saule	Pesticide and fertilization use forbidden.	1m^2 = 0.3 m^2 EFA
Afforested areas	-	-	-	1m^2 = 1 m^2 EFA
Catch crops / green cover	-	• Pois, Féverole, Lupins • Lentilles • Pois chiche • Soja, Luzerne cultivée, Trèfles • Sainfoin, Vesces, Mélilot, Serradelle, Fenugrec, Lotier corniculé, Minette, Gesses • Haricots, Flageolets, • Dolique, Cornille Arachide.	Sowing date between July 1st and October 1st.	1m^2 = 0.3 m^2 EFA
Nitrogen fixing crops	-	Species sown pure or mixed **Borraginacées :** Bourrache	Pesticide use forbidden since 2018.	1m^2 = 0.7 m^2 EFA

		Graminées : Avoines, Ray-grass, Seigles, Sorgho fourrager, Brôme, X-Festulolium, Dactyles, Fétuques, Fléoles, Millet jaune, perlé, Mohas, Pâturin commun **Polygonacées :** Sarrasin **Brassicacées :** Cameline : Chou fourrager : Colzas : Cresson alénois : Moutardes : Navet, navette, Radis (fourrager, chinois) , Roquette **Hydrophyllacées :** Phacélie **Linacées :** Lins **Astéracées :** Niger, Tournesol **Fabacées :** Féveroles , Fenugrec, Gesses cultivées, Lentilles, Lotier corniculé, Lupins (blanc, bleu, jaune), Luzerne cultivée, Minette, Mélilots, Pois, Pois chiche, Sainfoin, Serradelle, Soja, Trèfles, Vesces		

National list of species included in the EFA flowering fallow

Nom	Genre / espèce
Achillée	Achillea millefolium
Agastache fenouil, Hysope anisée	Agastache foeniculum
Aneth	Anethum graveolens
Bleuet des moissons	Cyanus segetum
Bourrache officinale	Borago officinalis
Campanules	Campanula spp.
Carotte	Daucus carota
Centauree de Timbal	Centaurea jacea
Chicorée sauvage	Cichorium intybus
Consoude des marais	Symphytum officinale
Coréopsis	Coreopsis spp.
Fenouil commun	Foeniculum vulgare
Fèverole, Fève	Vicia faba
Gesse	Lathyrus sativus
Knautie, Scabieuse	Knautia spp.
Lin vivace	Linum perenne
Lotier corniculé	Lotus corniculatus
Luzerne	Medicago sativa
Luzerne lupuline, Minette	Medicago lupulina
Mauve sauvage, Grande mauve	Malva sylvestris
Mélilots	Trigonella spp.
Nigelle de Damas	Nigella damascena
Onagre bisannuelle	Oenothera biennis
Origan commun	Origanum vulgare
Pavot, coquelicot	Papaver spp.
Phacélie à feuilles de Tanaisie	Phacelia tanacetifolia
Pulmonaire officinale	Pulmonaria officinalis
Sainfoin, Esparcette	Onobrychis viciifolia
Sarrasin	Fagopyrum esculentum
Sauges	Salvia spp.
Scabieuses	Scabiosa spp
Souci	Calendula officinalis
Trèfle d'Alexandrie	Trifolium alexandrinum
Trèfle hybride	Trifolium hybridum
Trèfle incarnat	Trifolium incarnatum
Trèfle rampant	Trifolium repens
Trèfle renversé, Trèfle de Perse	Trifolium resupinatum
Trèfle violet, Trèfle des prés	Trifolium pratense
Valérianes	Valeriana spp.
Vesces	Vicia spp.
Vipérine commune	Echium vulgare

Criteria used to define ESPG in France

CRITERES UTILISES POUR LA DETERMINATION DES PRAIRIES PERMANENTES SENSIBLES

Dans le cadre de la réforme de la Politique Agricole Commune, entre en vigueur à compter de 2014 un nouveau paiement découplé, le paiement vert, dont le paiement est soumis aux exigences du verdissement.

Un des trois critères de verdissement consiste à contribuer à maintenir les surfaces en prairies permanentes. L'une des deux obligations à ce titre est l'interdiction de labourer les surfaces en prairies permanentes retenues comme « sensibles » (et donc de les convertir en terre arable).

Les autorités Françaises ont décidé de désigner des prairies sensibles **uniquement dans les zones Natura 2000** (ce qui correspond strictement aux obligations réglementaires).

Ont été retenues les surfaces qui étaient en 2014 déclarées :

- en **landes, estives et parcours** en zone Natura 2000 ;
- en **prairie naturelle et prairie temporaire de plus de cinq ans** dans un sous-zonage de Natura 2000.

Pour les prairies naturelles et temporaires de plus de cinq ans, un travail de **ciblage** a en effet été conduit en collaboration entre le Muséum national d'histoire naturelle (MNHN) et une antenne de l'Institut national de la recherche agronomique : l'Observatoire du développement rural (INRA-ODR).

Ce travail de ciblage a dans un premier temps consisté à **restreindre le nombre de sites** du réseau Natura 2000. En effet, ce réseau réunit un ensemble de sites naturels identifiés pour la rareté ou la fragilité des espèces sauvages, animales ou végétales, et de leurs habitats : il est constitué de la somme des Zones de protection spéciales (ZPS) définies dans la Directive « Oiseaux » de 1979 et les Zones spéciales de conservation (ZSC) instaurées par la Directive « Habitats, faune, flore » de 1992. Le MNHN a sélectionné parmi ces sites Natura 2000 ceux désignés pour la présence d'habitats ou d'espèces inféodées aux milieux prairiaux.

Dans un second temps, le MNHN a **quantifié la richesse en biodiversité** de ces sites au travers deux prismes d'étude :

- quelle est la biodiversité des prairies humides ?
- quelle est la biodiversité des prairies mésophiles et prairies sèches ?

(i) Concernant la Directive « Habitats, faune, flore », le MNHN a sélectionné des espèces et les habitats parmi ceux mentionnés en annexe de la Directive, en se base sur un rapport technique réalisé par l'Agence européenne pour l'environnement en collaboration avec la Commission Européenne et publié en 2010, sur le suivi des tendances en termes de biodiversité. Dans ce rapport, chaque espèce et habitat d'intérêt communautaire est affecté à un ou plusieurs grands types d'écosystème, dont les prairies. Le MNHN a sélectionné :

- pour les prairies humides : ceux qui sont associés à la fois aux prairies et aux zones humides ;
- pour les prairies mésophiles et prairies sèches : ceux qui sont associés aux prairies mais pas aux zones humides.

Les listes d'espèces et d'habitats retenus sont en annexes B et C de ce document.

a. National note on pollinator protection

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE

Note nationale BSV

ÉCOPHYTO
RÉDUIRE ET AMÉLIORER L'UTILISATION DES PHYTOS

Les abeilles, des alliées pour nos cultures : protégeons-les !

3ème édition, avril 2018

Cette note a été rédigée par un groupe de travail DGAl[1], APCA[2], ITSAP-Institut de l'abeille[3], ADA[4] France et soumise à la relecture du CNE[5].

1- Ministère de l'Agriculture et de l'Alimentation, Direction générale de l'alimentation.
2- Assemblée permanente des chambres d'agriculture.
3- Institut technique et scientifique de l'apiculture et de la pollinisation.
4- Fédération nationale des associations régionales de développement de l'apiculture.
5- Comité national d'épidémiosurveillance dans le domaine végétal.

Crédits photos : J. Juillen (DGAl-SDQSPV), sauf p.3, apiculteur en action : Florence Almont-Marie (CA 17).

En butinant de fleur en fleur, les insectes pollinisateurs participent à la production de nombreuses cultures et contribuent aussi à la qualité des récoltes. À l'échelle mondiale, 80 % des plantes à fleurs se reproduisent grâce à ces insectes auxiliaires, en particulier aux abeilles.

Préserver la santé des abeilles

Les causes de dépérissement des abeilles sont multiples. La préservation de la santé du cheptel apicole implique la mise en place de bonnes pratiques au niveau de :
- la gestion des ressources alimentaires des abeilles ;
- la maîtrise des risques sanitaires du cheptel ;
- la protection des cultures par la mise en œuvre des méthodes de lutte intégrée.

Pour protéger les insectes pollinisateurs, les pouvoirs publics ont renforcé les études écotoxicologiques, la réglementation, ainsi que les contrôles sanitaires et phytosanitaires.

Les voies d'exposition

Des intoxications d'insectes pollinisateurs peuvent se produire quand les produits phytopharmaceutiques sont appliqués, tant sur les plantes cultivées que sur la flore spontanée. La contamination peut avoir lieu à deux moments (pendant et après le traitement phytosanitaire), par deux voies d'intoxication différentes :

- **par contact** : quand l'abeille est exposée directement à un produit dangereux ; se pose sur une fleur ou sur la végétation traitée ; reçoit des vapeurs ou des poussières toxiques ;

- **par ingestion** : quand l'abeille prélève du nectar ou du pollen sur des fleurs contaminées suite à une pulvérisation ; par l'utilisation avant floraison d'un produit rémanent ou systémique ; suite à un enrobage de semence avec un produit systémique et persistant durant la floraison ; ou enfin par des poussières d'enrobage insecticide émises lors de semis en l'absence de mesures appropriées de gestion des risques.

Connaître les risques toxicologiques pour les abeilles avant de traiter

ETIQUETTE PRODUIT PHYTO.

Phrases de risque Spe 8

« Précautions à prendre pour la protection de l'environnement »

Dangereux pour les abeilles. / Pour protéger les abeilles et autres insectes pollinisateurs, ne pas appliquer durant la floraison. / Ne pas utiliser en présence d'abeilles. / Retirer ou couvrir les ruches pendant l'application et (indiquer la période) après traitement. / Ne pas appliquer lorsque des adventices en fleur sont présentes. / Enlever les adventices avant leur floraison. / Ne pas appliquer avant (indiquer la date).

Les professionnels de la production végétale, du paysage et des forêts doivent impérativement connaître l'écotoxicité des produits phytosanitaires avant de les utiliser. La règle de base consiste à lire **l'étiquette du produit** figurant sur l'emballage (classement toxicologique, phrases de risque correspondantes).

En complément, il est possible de consulter :

- le catalogue des produits phytopharmaceutiques et de leurs usages autorisés en France **e-phy** : ephy.anses.fr

- les **fiches de données de sécurité des produits phytopharmaceutiques** : www.quickfds.com ou www.phytodata.com

- **l'Index Acta phytosanitaire**, mis à jour chaque année ;

- la base **Agritox** qui renseigne sur le classement toxicologique des substances actives : **www.agritox.anses.fr**

Le respect des obligations réglementaires*

• *Conditions d'utilisation des insecticides et acaricides à usage phytosanitaire*

D'une façon générale, il faut noter que l'arrêté du 28 novembre 2003, paru au Journal officiel du 30 mars 2004, **interdit tout emploi d'insecticides ou d'acaricides en période de floraison ou de production d'exsudats** ; ceci afin de protéger les abeilles et autres insectes pollinisateurs.

Par dérogation, l'emploi d'insecticides et acaricides en période de floraison ou de production d'exsudats est cependant possible dès lors que deux conditions sont réunies et respectées :

1. L'intervention a lieu **en dehors des périodes de butinage** (tard le soir, de préférence) : les abeilles peuvent être actives du lever du jour au coucher du soleil ;
2. Le produit insecticide ou acaricide employé **bénéficie d'une mention « abeilles »**.

L'arrêté définit en effet trois types de mention « abeilles » pouvant être attribuées aux insecticides ou acaricides :

- « *Emploi autorisé durant la floraison en dehors de la présence d'abeilles* » ;
- « *Emploi autorisé au cours de périodes de production d'exsudats, en dehors de la présence d'abeilles* » ;
- « *Emploi autorisé durant la floraison et au cours des périodes de production d'exsudats, en dehors de la présence d'abeilles* ».

• *Eviter les dérives lors des traitements*

L'arrêté interministériel du 4 mai 2017 impose aux applicateurs de mettre en œuvre des moyens appropriés pour éviter tout entraînement des produits phytopharmaceutiques en dehors des parcelles ou des zones traitées. Il convient dans ce cadre d'éviter toute dérive des produits vers les ruches et ruchers.

• *Mesures anti-dérive lors du semis*

L'arrêté interministériel du 13 janvier 2009 précise les conditions d'enrobage et d'utilisation des semences traitées par des produits phytopharmaceutiques en vue de limiter l'émission des poussières lors du procédé de traitement en usine.

*pour consulter les textes réglementaires en vigueur, rendez-vous sur : www.legifrance.gouv.fr

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• ***Proscrivez les mélanges de produits phytopharmaceutiques dangereux pour les abeilles***
L'association de certaines molécules à visée phytopharmaceutique peut faire courir un risque important aux pollinisateurs (effets possibles de synergies). Pour cette raison, il convient d'être extrêmement vigilant en matière de mélanges et de respecter l'arrêté ministériel du 7 avril 2010. Ce dernier prévoit dans son article 8 que « durant la floraison ou au cours des périodes de production d'exsudats, au sens de l'article 1er de l'arrêté du 28 novembre 2003 susvisé, **un délai de 24 heures soit respecté entre l'application d'un produit contenant une substance active appartenant à la famille chimique des pyréthrinoïdes et l'application d'un produit contenant une substance active appartenant aux familles chimiques des triazoles ou des imidazoles**. Dans ce cas, le produit de la famille des pyréthrinoïdes est obligatoirement appliqué en premier ». Les mélanges extemporanés de pyréthrinoïdes avec triazoles/imidazoles sont donc interdits en période de floraison et d'exsudation de miellat.

A RETENIR

- **En période de floraison ou de production d'exsudats, il est interdit de traiter en présence d'abeilles.** Même si le produit comporte la mention « abeilles », cela ne signifie pas qu'il est inoffensif.
- **Des pollinisateurs sauvages sont présents sur des plages horaires plus larges au cours de la journée et avec des températures plus fraîches** (par ex. les bourdons). Les comportements et modes de vie de ces insectes (horaires de butinage, mode de nidification et de reproduction, préférences alimentaires, …) sont variés et peuvent différer de ceux de l'abeille domestique. De plus, leur sensibilité aux produits phytopharmaceutiques peut être différente.

Les bonnes pratiques pour favoriser l'activité des insectes pollinisateurs et pour maintenir des ressources alimentaires en dehors des périodes de floraison des cultures mellifères

- Avant toute prise de décision concernant une éventuelle intervention phytosanitaire, pensez à consulter le bulletin de santé du végétal (BSV) et à évaluer rigoureusement l'état phytosanitaire de la culture.
- Ne laissez jamais d'eau polluée par des substances actives chimiques autour des parcelles ou sur votre exploitation, les abeilles s'abreuvent et collectent plus de 25 litres d'eau par an pour assurer le développement de leur colonie.
- Favorisez la présence des insectes pollinisateurs pour la pollinisation de vos cultures en implantant des espèces mellifères autour de vos parcelles (bandes mellifères le long des cours d'eau et bord de champ, haies mellifères, CIPAN mellifères…). Si vous devez réaliser une intervention, rendez non attractifs pour les abeilles les couverts herbacés et fleuris entre-rangs dans la parcelle à traiter, par exemple en les broyant ou les fauchant en dehors des périodes de butinage.
- Pour ne pas que la flore mellifère devienne un piège pour les pollinisateurs, il est impératif que la dérive des traitements réalisés sur les cultures voisines soit évitée.
- Participez au maintien de l'apiculture sur votre territoire en diversifiant vos cultures à la faveur de rotations longues intégrant des légumineuses ou des oléoprotéagineux.
- Laissez des plantes messicoles s'implanter en bordures et à l'intérieur des champs pour favoriser les espèces végétales nectarifères et pollinifères. Consultez le site Internet : www.ecophytopic.fr

N'hésitez pas à échanger avec les apiculteurs qui travaillent autour de vous et adaptez vos pratiques en leur demandant conseil vis-à-vis des abeilles.

Pour plus d'informations sur les abeilles et l'apiculture, contactez l'ADA (association de développement apicole) de votre région, le référent apiculture de la chambre régionale d'agriculture ou consultez le site Internet de l'ITSAP-Institut de l'abeille www.itsap.asso.fr

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Number of farmers that subscribed to each TOs between 2015 and 2018, area concerned and related expenditure in Centre Val-de-Loire

	Relevant TO	Number of farmers	Area (in ha, lm or elements)	Total expenditure
Whether to offer AECM support for biodiversity-friendly grassland management practices & whether management requirements consider pollinator relevance	LINEA_08 - Maintenance of refuge strip on Grasslands	Not open		
	HERBE_03 - Total absence of mineral and organic nitrogen fertilization (excluding possible input by grazing) on grassland	341	4297.32	882,556.57 €
	HERBE_04 - Adjustment of the grazing pressure over specific periods (loading in the field on remarkable environment)	39	729.75	90,738.39 €
	HERBE_06 - Mowing delays on grassland and remarkable habitats	345	3517.3	1,069,339.35 €
	HERBE_07 - Maintaining the floristic richness of a permanent grassland	110	3494.65	242,327.7 €
	HERBE_08 - Maintenance of remarkable grassland by non-motorized mowing	Note eligible in CVL		
	HERBE_09 - Improvement of pastoral management	18	468.65	68,418.77 €
	HERBE_11 - No grazing and mowing in winter on meadows and remarkable wet habitats	22	287.92	89,153.25 €
	HERBE_12 - Water maintenance of grassland lowlands	Note eligible in CVL		
	HERBE_13 - Management of wetlands	5	28.86	4,944.27 €
	SHP_01 - Individual operation of grazing and pastoral systems - maintenance	98	8174.78	690,526.36 €
	SHP_02 - Collective action for grazing and pastoral systems - maintenance			
Whether to offer AECM funding for	COUVER_05 - Creation and maintenance of a network of ecological regulation areas	3	3.15	1,146.19 €

the creation of pollinator borders or strips on arable land	COUVER_07 - Creation and maintenance of cover of floristic or faunistic interest	334	2275.91	1,271,889.34 €
	LINEA_05 - Mechanical maintenance of grassed banks in cultivated plots	Not eligible in CVL		
Whether to offer AECM support for Integrated Pest Management and reduced pesticide use	SGC_01 - Field Cropping Systems Operation	84	11604.89	1,651,599.31 €
	SGC_02 - Field crop system operation adapted to intermediate areas			
	SGC_03 - Field crop system operation adapted to areas with a high proportion of vegetable or industrial crops			
	PHYTO_01 - Assessment of Crop Protection Strategy	95	8744.97	651,996.24 €
	PHYTO_02 - Absence of synthetic herbicide treatment	Not open		
	PHYTO_03 - No phytosanitary synthetic treatment	1	28.34	6,895.12 €
	PHYTO_04 - Gradual reduction in the number of registered doses of synthetic herbicide treatments	28	2166.3	390,160.66 €
	PHYTO_14 - Gradual reduction in the number of registered doses of synthetic herbicide treatments	9	558.16	76,522.98 €
	PHYTO_05 - Gradual reduction in the number of registered doses of phytosanitary treatments excluding herbicides	40	3095.56	505,347.97 €
	PHYTO_15 - Gradual reduction in the number of registered doses of phytosanitary treatments excluding herbicides	4	286.4	32,552.21 €
	PHYTO_06 - Adaptation of PHYTO_05	2	264.19	40,806.78 €
	PHYTO_16 - Adaptation of PHYTO_15	Not open		
	PHYTO_07 - Establishment of biological control	Not subscribed		

	PHYTO_09 - Diversity of crop succession in specialized crops	Not open		
	PHYTO_10 - Absence of synthetic herbicide treatment on the inter-row in perennial crops	3	54.74	6,052.25 €
Whether to support the creation, restoration and biodiversity-friendly management of hedges, trees and wood patches through the AECM.	LINEA_01 - Maintenance of localized hedges in a relevant way	127	579207	208,620.9 €
	LINEA_02 - Maintenance of isolated or aligned trees	32	712	2,819.52 €
	LINEA_03 - Maintenance of riverine forest	6	10198	9,561.42 €
	LINEA_04 - Maintenance of groves	Not open		
	LINEA_09 - Maintenance of tree hedges	Not eligible in CVL		
Whether to offer AECM for the creation and maintenance of wildlife fallow, e.g. through natural regeneration over a year or more or with wild seed mixes for pollinators.	COUVER_06 - Creation and maintenance of a perennial herbaceous cover (grass strips or plots)	332	4504.62	2,006,214.89 €
	COUVER_08 - Improvement of fallows	14	37.81	5,545.21 €
Whether to program AECM for restoration and maintenance of grazed heath and scrub habitats.	OUVERT_01 - Opening of an abandoned environment	2	11.12	2,891.39 €
	OUVERT_02 - Maintain openness by mechanical / manual removal of woody and unwanted vegetation	7	85.85	11,734.52 €
	OUVERT_03 - Maintain Opening by Burning or Prescribed Burning	Not eligible in CVL		

	HERBE_10 - Management of lawns and heath in undergrowth	1	40.1	5,929.19 €
	GARD_02 - Accompanying agro-pastoral activities in areas of high environmental value	NA	NA	NA
	Additional TO targeting domestic bees : API - Improving the pollinating potential of bees	46	13756	288,876 €

Example of authorised cover under COUVER_07 in « ZPS Beauce et Vallée de la Conie » territoire

Liste des couverts autorisés (rappel : le couvert doit associer au moins une légumineuse et une graminée).

Graminées	Légumineuses
Brome cathartique	Gesse commune (A)
Brome sitchensis	Lotier corniculé
Dactyle	Lupin blanc amer
Fétuque ovine (A)	Luzerne
Fétuque élevée	Mélilot*
Fétuque rouge(A)	Minette (A)
Fléole des prés	Serradelle
Moha	Sainfoin
Pâturin commun	Trèfle blanc
Ray-grass anglais	Trèfle de Perse (A)

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Ray-grass hybride	Trèfle incarnat (A)
	Trèfle violet (A)
	Trèfle d'Alexandrie (A)
	Vesce

(A) = annuelles
* Mélilot dans le respect de l'arrêté du 17 avril 2013

Example of authorised cover under COUVER_07 in « Petite Beauce et vallée de la Cisse» territoire

Liste des couverts autorisés :

- Mélange pérenne à base de **légumineuses/graminées ou légumineuses seules non récoltées**, dont des espèces mellifères : Luzerne, Dactyle, Fétuque des prés, Fétuque rouge, Fléole des prés, Gesse commune, Lupin blanc amer, Navette fourragère, Radis fourrager, Ray-grass anglais, Ray-grass hybride, Moha, Lotier corniculé , Mélilots, Minette, Moutarde blanche, Phacélie, Sainfoin, Trèfle d'Alexandrie, Trèfle blanc, Trèfle de Perse, Trèfle incarnat, Trèfle violet, Trèfle hybride, Vesce commun et Vesce velue, Ray Grass anglais, Rays Grass hybride

- Mélanges de **cultures annuelles/cynégétiques** à fort intérêt floristique et/ou faunistique : Maïs, Moha, Millet, Sarrasin, Sorgho fourrager, Sorgho grain, Tournesol, Phacélie, Moutarde

2.4 Germany: Baden-Württemberg

Authors: Dr. Rainer Oppermann and Johannes Mangerich (IFAB)

Abbreviations

AECM: Agri-Environment Climate Measure

BfN: Federal Agency for Nature Conservation

BMEL: Federal Ministry of Food and Agriculture Germany

BMU: Federal Ministry for the Environment Germany

CAP: Common Agricultural Policy

DVL: Deutscher Verband für Landschaftspflege

EFA: Ecological Focus Area

ESPG: Environmentally Sensitive Permanent Grassland

FAKT: Funding programme for agri-environment, climate protection and animal welfare

IEEP: Institute for European Environmental Policy

IFAB: Institute for Agroecology and Biodiversity

ILN: Institut für Landschaftsökologie und Naturschutz

LTZ: Center for Agricultural Technology Augustenberg

Maßnahmen- und Entwicklungsplan Ländlicher Raum Baden Württemberg 2014-2020

MEPL III: Maßnahmen- und Entwicklungsplan Ländlicher Raum Baden-Württemberg 2014-2020

MLR: Ministry of Rural Affairs and Consumer Protection Baden-Württemberg

PflSchG: Pflanzenschutzgesetz

RDP: Rural Development Programme

SMR: Statutory Management Requirements

UBA: Federal Environment Agency

VwV NWW: Verwaltungsvorschrift Nachhaltige Waldwirtschaft

Introduction

This case study answers some of the questions for Germany as a whole, and then uses the case study of an RDP at federal level as an example. Since 14 different RDPs exist in Germany, a complete consideration of all RDPs would go beyond the scope of the study. Baden-Württemberg was chosen as an example because it has one of the most comprehensive RDPs.

In Part 1, unless stated otherwise, the answers refer to Germany. Part 2 was answered using the example of Baden-Württemberg. Part 3 concerns the entire Federal Republic, in some cases examples from individual federal states are provided. The questions in Part 4 are answered for Baden-Württemberg since data were available here.

The requested information was collected through literature and internet research, data analysis and telephone interviews. The information from the answers was compiled as follows:

Literature and internet research

- Official information material on the implementation of the CAP at federal level, provided by the Federal Ministry of Food and Agriculture (BMEL)

- Official information material on the implementation of the CAP at the level of federal states, provided by the respective ministries of the federal states and their institutions, such as: the Ministry of Rural Affairs and Consumer Protection Baden-Württemberg (MLR) and the Center for Agricultural Technology Augustenberg (LTZ)

- Information and publications on the implementation of the CAP and on the topics covered in the case study, issued by the authorities of the Federal Ministry for the Environment (BMU) – i.e. the Federal Environment Agency (UBA) and the Federal Agency for Nature Conservation (BfN)

- Legal regulations and their procedures at the level of the European Union, the Federal Republic and the federal states

- Scientific studies and publications on the topics covered in the case study (DVL, Ifls, IFAB)

Data analysis

- Data on the implementation of the 'Funding programme for agri-environment, climate protection and animal welfare Baden-Württemberg' (FAKT), as well as publicly available data of the Statistical Office of Baden-Württemberg

- Analysis of available Information on the design of AUCM flowering strips in the federal states and analysis of available figures on the implementation of the AUCM flowering strips in the federal states.

Telephone interviews with:

- Wild bee expert: Mr. Schanowski (Dipl. Biologist), Institut für Landschaftsökologie und Naturschutz (ILN) Bühl

- Undersecretary of the Bavarian State Ministry of the Environment and Consumer Protection (StMUV): Mr. Güthler, Department 64 – Landschaftspflege und Naturschutzförderung

- Executive director of Deutscher Verband für Landschaftspflege (DVL): Mr. Dr. Metzner

- Various consulting organizations from Baden-Württemberg:

o Mr. Betzler, Beratungsdienst Ökologischer Obstbau e. V.,

o Mr. Weiler, Bioland Beratungsdienst GmbH,

o Mr. Pape, grünweg - Projektmanagement & Beratung,

o Mr. Schöneberger, Landwirtschaftlicher Beratungsdienst Ravensburg e. V.

Other data tables and further information on individual issues are available on request from IEEP. The text refers to the corresponding tables available in this supplementary material.

Supplementary material in the annexes available on request:
Annex I: Übersicht über die Fördermöglichkeiten von Blühflächen und -streifen der einzelnen Bundesländer in der GAP-Förderperiode 2014-2020 – Teil I
Annex II: Übersicht über die Fördermöglichkeiten von Blühflächen und -streifen der einzelnen Bundesländer in der GAP-Förderperiode 2014-2020 – Teil II
Annex III: Übersicht über den Stand der Umsetzung von Blühflächen und -streifen in den einzelnen Bundesländern in der GAP-Förderperiode 2014-2020
Annex IV: Übersicht über die bestäuberfreundlichen Maßnahmen des Förderprogramms FAKT des Landes Baden-Württemberg

Annex V: Übersicht über die bestäuberfreundlichen Maßnahmen des Vertragsnaturschutzes (Landschaftspflegerichtlinie (LPR) – Teil A) des Landes Baden-Württemberg
Annex VI: Anteil der bestäuberfreundlichen FAKT-Fördermaßnahmen jeweils an der gesamten landwirtschaftlichen Nutzfläche, bzw. Ackerland oder Grünland in Baden-Württemberg im Jahr 2017
Annex VII: Anteil der bestäuberfreundlichen Fördermaßnahmen des Vertragsnaturschutzes (LPR – Teil A) jeweils an der gesamten landwirtschaftlichen Nutzfläche, bzw. Ackerland oder Grünland in Baden-Württemberg im Jahr 2018

Part 1: How pollinator considerations played a part in your Member State or region's CAP implementation decisions

In Germany, wild pollinators, their habitats, and their livelihoods have hardly played an explicit role in the implementation of the CAP 2014-2020. This is underlined in the brochure "Implementation of the EU Agrarian Reform in Germany" published by the Federal Ministry of Food and Agriculture (BMEL) in 2015 (BMEL, 2015). In this publication (122 pages) bees and beneficial insects (pollinators) are mentioned only once in the context of both annual and perennial flowering strips. It is described that sowing flowering mixtures gives cover, food and host to pollinators and other wild animals.

However, there is the pollinator-friendly Agri-Environment Climate Measure (AECM) "flower strips / area" in the entire federal territory and various other pollinator-friendly measures, which is in the following illustrated by the example of the federal state of Baden-Württemberg.

The implementation of flower strips / areas in Germany

The preparation and implementation of the RDPs in Germany is in the responsibility of the 16 federal states. There are 14 RDPs in Germany. Two city states each cooperate with another federal state. In 13 out of 14 RDPs annual and/or perennial flowering strips are EFA (Ecological Focus Area) requirement is given by eight federal states.

The support schemes of the flower strips / areas differ in the individual federal states. Some of the country-specific features have a particularly positive effect on wild pollinators (see Annex II):

- In Lower Saxony and Bremen, higher subsidy rates are granted for the planting of flowering strips, in cases where the implementation is supported from the viewpoint of nature conservation aspects. A nature conservation authority or a landscape care association must approve the location according to the value for nature conservation.

- Two federal states (Bavaria and Rhineland-Palatinate) connect the funding rate to the soil quality. One reason is to give an incentive for implementing flower strips also to farmers on arable land with good soil quality. Bavarian officials found that farmers implemented flowering strips mostly on arable land with bad soil quality. This has the consequence that areas dominated by good soil quality are free of flowering strips and are often also free of other important structures for pollinators and other insects[25].

- Regional seed crops for multi-annual mixtures: The states of Bavaria, Hesse, (Mecklenburg-Western Pomerania), Saxony-Anhalt and in part Rhineland-Palatinate and Saxony have as a condition that when planting multi-annual flower strips/areas as AECM, regional seeds must be used (regional seeds prevents the adulteration of flora, the loss of genetic variety of the species). Only the mixtures in Saxony-Anhalt, depending on the composition also in Saxony, consist of 100% wild plants[26]. In the other federal states, the share of cultivated species is usually more than 50%[27].

Despite a (almost) nationwide support programme for flower strips and flowering areas, this type of measure is implemented only at about 0.5% of the area of arable land in Germany, according to the data from the funding period 2016 and 2017 (see Annex III). The self-imposed and expected target area has not yet been reached in any of the federal states.

Pollinator-friendly measures in Baden-Württemberg

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[25] Personal information from the regional advisory service in Würzburg (Bavaria).
[26] Land Sachsen Anhalt (2018): Merkblatt zum Antrag auf Gewährung von Zuwendungen für Markt- und standortangepasste Landbewirtschaftung (MSL) mit Verpflichtungsbeginn zum 01.01.2019; at https://www.inet17.sachsen-anhalt.de/Profilinet_ST_P/public/Hilfe/Info/ST18_MSL_Merkblatt.pdf (p. 7).
27 See https://www.rieger-hofmann.de/sortiment/mischungen/agrarumweltmassnahmen/uebersicht.html.

As explained in Part 2, Baden-Württemberg exemplifies the extent to which wild pollinators played or play a role in the preparation and implementation of the RDP.

The RDP of Baden-Württemberg is called "Maßnahmen- und Entwicklungsplan Ländlicher Raum – Baden-Württemberg 2014-2020 (MEPL III)". It is summarized in form of a brochure for the general public[28], the full and long version composes 1011 pages[29]. AECM in Baden-Württemberg are composed of measures within the support programme for agri-environment, climate protection and animal welfare (FAKT) and contractual nature conservation according to the Directive of countryside conservation (LPR). FAKT provides measures that cover the entire agricultural area whereas measures of contractual nature conservation only support measures on a case-by-case basis and in defined regional areas.

In the RDP of Baden-Württemberg pollinators are mentioned in connection with different measures. On the one hand pollinators are listed in relation to measures for which the positive effects can only be confirmed limitedly from a technical point of view, as for example the FAKT measure E1.2 - greening mixtures in arable cultivation / horticulture[30]. On the other hand, measures that are proven to deliver benefits for wild pollinators, such as all measures of contractual nature conservation, do not mention wild pollinators.

Therefore, Annex IV (FAKT) & V (LPR) lists all AECM measures for Baden-Württemberg, which we (IFAB) classify as pollinator-friendly on the basis of many years of experience. With regard to the total agricultural area in Baden-Württemberg, pollinator-friendly measures account for approximately 9.6% on grassland and 1.2% on arable land (see annex VI (FAKT) & VII (LPR)).

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[28] MLR (Ministerium für Ländlichen Raum und Verbraucherschutz) (2018a): MEPL III. Förderprogramme für Ländlichen Raum, Landschaft und Landwirtschaft. Maßnahmen- und Entwicklungsplan Ländlicher Raum Baden-Württemberg 2014-2020 (MEPL III), 4th. Edition. 33 p. at at https://mlr.baden-wuerttemberg.de/fileadmin/redaktion/m-mlr/intern/dateien/publikationen/MEPL_III_Foerderprogramme.pdf

29 MLR (2018b): Germany - Rural Development Programme (Regional) - Baden-Württemberg. 1011 p. Download under: https://www.landwirtschaft-bw.info/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/mlr/MEPL/mepl_extern/MEPL_III_gesamt/_2018-07-04-MEPL%20III%20mit%20NRR%20nach%203.%20%C3%84A%20_genehmigt_f%C3%BCr%20MEPL-Homepage.pdf.

30 MLR (2018b), p. 633.

In the information materials for farmers distributed e.g. by the agricultural offices, only the FAKT measure E2 "Greening of fallow land with blooming mixtures" is stated to have a positive effect on pollinators [31].

The establishment of a new FAKT measure from 2019 onwards shows the growing focus on pollinators. The positive effects on pollinators for the measure E7 “flower, breeding and refuge area” are explained and communicated towards the farmers and the broad public[32].

31 MLR (2017): Förderprogramm für Agrarumwelt, Klimaschutz und Tierwohl (FAKT) Baden-Württemberg; at https://mlr.baden-wuerttemberg.de/fileadmin/redaktion/m-mlr/intern/dateien/publikationen/Landwirtschaft/2017_Fakt_Foerderprogramm_Agrarumwelt_Klimaschutz_Tierwohl.pdf (p. 13); or in English language at https://foerderung.landwirtschaft-bw.de/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/mlr/GA/GA_018_extern/FAKT/FAKT_engl_blaetterbar/page.pdf

32 See https://www.landesjagdverband.de/fileadmin/user_upload/Fyler_FAKT.pdf.

Table 1: CAP measures which can affect wild pollinator habitats

CAP measure	***Programming decisions***	**Decisions were taken in Germany (MS) or in Baden-Wuerttemberg (region) and *Relevant factors*** *(Whether or not the needs of wild pollinators were considered regarding the implementation of measures and, if so, witch factors were discussed)*
Farm Advisory Service, RDP support for advice and training (M1 / M2)	*Whether to offer advice or training through FAS, M1 or M2 on:* *a.) how to manage species rich grassland so as to encourage pollinators* *b.) the creation and management of pollinator borders, in field strips or buffer strips so as to encourage pollinators* *c.) creation and management of pollinator-friendly arable fallow* *d.) pollinator-friendly creation and management of hedges, trees and wood patches* *e.) the management of heath and scrubland to promote pollinators* *f.) ways to manage forest land to promote pollinators*	<u>RDP Baden-Württemberg</u> - Training through FAS, M1 or M2 is not available. - In general, advice on the needs of wild pollinators and their protection is not part of the FAS. On a case-by-case basis and on request, however, advice is given. - Advices through M1 are not available. - Advices through M2 are offered by the Biodiversity Advisory Service of Agricultural Holdings within the framework of MEPL III. Pollinators are part of biodiversity, yet not the focus of every consultation. This depends on the operation and consultant. Even if the benefits of pollinator-friendly measures are not explicitly communicated, pollinators still benefit from the implementation of the measures. a.) The management of (species-rich) grassland measure offers farmers specific advice on the promotion and protection of pollinators, such as grassland extensification or the retention of flowering strips on intensively used grassland. A list of possible AECM measures can be found in Annex IV & V. However, usually advice does not specifically focus on pollinators. b.) The creation and management of pollinator borders measure offers advice on the promotion and protection of pollinators, such as advice on pollinator-friendly seeds. A list of possible AECM measures can be found in Annex IV. However, usually advice focuses not specifically on pollinators but on the optimal management of flowering strips to avoid agricultural problems. c.) No specific advice on fallows. However, flower strips and flower areas are seeded on fallow land. d.) Normally there is no advice for pollinator-friendly creation and management of hedges, trees and wood patches. In Baden-Württemberg the landscapes are mostly small-scaled and don't need specific hedge and tree management. e.) None of the interviewed consultants advised on the management of heath and scrubland. f.) Not available Relevant factors: The needs of wild pollinators were not considered when decision was reached.
Agri-Environment Climate Measure	*a.) Whether to offer AECM support for biodiversity-friendly grassland management practices &*	<u>RDP Baden-Württemberg</u> a.) Biodiversity-friendly grassland management practices are supported by AECM. A list of measures is given in Annex IV and V.

(AECM) and linked non-productive investments (M4.4) (e.g. for habitat creation and restoration)	*b.) whether management requirements consider pollinator relevance*	b.) There are no specific management requirements regarding the pollinators. However, the focus of some of the biodiversity-friendly grassland management practices is to maintain and enhance biodiversity in general. The design of the FAKT measure B3 is success-oriented in Baden-Württemberg, i.e. it rewards species diversity. A regular later cut is partly funded in the LPR measures. The cutting time is only one of many factors influencing the biodiversity of grassland. Relevant factors: Pollinators needs are mentioned: The management practices of FAKT-measure B1.1'extensive cultivation on the entire grassland' increase the grasslands value as habitat for insects[33].
	Whether to offer AECM funding for the creation of pollinator borders or strips on arable land	<u>RDP Baden-Württemberg</u> Realising flowering strips on arable land is supported by FAKT-measure E2 – Greening on fallow land with blooming mixtures. This measure can be realised as stripe with a width of at least 5 m or as flowering area. No use of nitrogenous fertilizers and pesticides is allowed[34]. Three seed mixtures are predetermined, two annual ones and one winter hardy seed mixture. The seed mixtures are partly appropriate for pollinators. Relevant factors: Pollinators needs are mentioned as followed: Flowering plants offers food, refuge, migration sectors and space for reproduction to pollinators all over the vegetation period[35].
	a.) Whether to offer AECM support for Integrated Pest Management and *b.) reduced pesticide use*	<u>RDP Baden-Württemberg</u> a.) AECM does not offer support for Integrated Pest Management. a.) For maize and fruit cultivation there are two AECMs offering support for reduced pesticide use. The FAKT measures E4 - "application of Trichogramma in corn" and E6 – "pheromone use in fruit production" are to be regarded as such. However, this is only a first small step towards pesticide b.) reduction, and it is not a measure that really enhances pollinator biodiversity.

[33] MLR (2018b), p. 587.
[34] MLR (2017), p. 19.
[35] MLR (2017), p. 13.

		Relevant factors: Pollinators needs are mentioned as followed: Beneficial organisms that occur in the environment are preserved[36].
	Whether to support the creation, restoration and biodiversity-friendly management of hedges, trees and wood patches through the AECM.	RDP Baden-Württemberg In the frame of the LPR the creation and biodiversity-friendly management of hedges and wood patches can be supported[37]. There is no specific support for hedgerow management. Relevant factors: The needs of wild pollinators were not considered when decision was reached.
	Whether to offer AECM for the creation and maintenance of wildlife fallow, e.g. through natural regeneration over a year or more or with wild seed mixes for pollinators.	RDP Baden-Württemberg There is support for flower seed mixtures on fallow land. Relevant factors: There is no evidence whether wild pollinators were discussed or not.
	Whether to program AECM for restoration and maintenance of grazed heath and scrub habitats.	RDP Baden-Württemberg The restoration and maintenance of heath and scrub habitats in Baden-Württemberg is supported through contractual nature conservation in the frame of the LPR. Relevant factors: There is no evidence whether wild pollinators were discussed or not.
Organic farming support	*Whether pollinator conservation is mentioned as a reason for supporting organic farming.*	RDP Baden-Württemberg Pollinator conservation is not mentioned as a reason for the support of organic farming. Relevant factors: The needs of wild pollinators were not considered when decision was reached.
Other RDP measures	*Whether to programme the RDP measures for* *a.) agroforestry* *b.) forest conservation, and*	RDP Baden-Württemberg a.) Agroforestry is not supported by RDP measures.

[36] MLR (2018b), p. 656.
[37] MLR (2018b), p. 431.

	c.) environmental afforestation *d.) Whether to offer forest restoration support for the conversion of closed coniferous stands to open mixed deciduous forest.*	b.) Forest conservation is supported by the administrative regulation on sustainable forestry "Nachhaltige Waldwirtschaft" (VwV NWW, Part C[38]. This also includes the creation, development and expansion of coppice and mixed coppices. c.) Environmental afforestation is supported by Nachhaltige Waldwirtschaft (VwV NWW), Part A[39]. d.) Conversion of closed coniferous stands to open mixed deciduous forest is supported by Nachhaltige Waldwirtschaft (VwV NWW), Teil B[40]. Relevant factors: The needs of wild pollinators were not considered when decision was reached.
GAEC rules	*a.) Whether to protect buffer strips through cross-compliance by listing them under GAEC 7 (beyond what is legally required by Water Framework Directive rules and/or nitrate action plan rules).* *b.) Whether to protect hedges, trees and tree patches from destruction by listing them as landscape features under cross-compliance GAEC 7, and whether any additional conditions are defined that might benefit pollinators.*	<u>Germany</u> Field margins with a minimum width of 2 m are protected by listing them under GAEC 7. These have the following characteristics: covered predominantly with grassy and herbaceous plants, narrow, elongated areas with a total width of more than 2 meters, on which no agricultural production takes place, situated within, adjacent or between agricultural fields [41]. The following pollinator-friendly landscape elements are listed under GAEC 7: - hedges - rows of trees - field copses - individual trees - wetlands (<2000m^2) - field margins (>2m width) - dry and natural stone walls - clearance cairns

38 Verwaltungsvorschrift des Ministeriums für Ländlichen Raum und Verbraucherschutz über die Gewährung von Zuwendungen für Nachhaltige Waldwirtschaft (VwV NWW) Vom 25. November 2015 — Az.: 52-8678.01 — at: https://foerderung.landwirtschaft-bw.de/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/mlr/Foerderwegweiser/Nachhaltige_Waldwirtschaft/Antrag/B_Rechtsgr_14-20/VwV%20NWW%2025.11.2015.pdf.pdf?attachment=true, p. 25.

39 VwV NWW, p. 9.

40 VwV NWW, p. 12.

41 MLR (2019a): Zusammenstellung aller Änderungen der Erläuterungen und Ausfüllhinweise zum Gemeinsamen Antrag 2019. Download at: https://www.landwirtschaft-bw.info/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/mlr/GA/GA_019_extern/Allgemein/Merkblaetter/CC_Infobroschuere_2019.pdf; p. 8.

		- rock and stone bars, natural stone surfaces (<2000m^2) - terraces Cross compliance obligations include i.a. the Statutory Management Requirements - SMR 10 regulates the basic requirements for plant protection on the basis of the European Regulation (EC) No. 1107/2009 concerning the placing on the market of plant protection products, supplemented by the country-wide valid Plant Protection Act (PflSchG) and the regulations based thereon[42]. In accordance with the good professional practice in plant protection, the drift into endangered objects, waters and biotopes that are particularly worthy of protection must be avoided at all costs. For example, the product-specific spacing requirements for the protection of adjacent biotopes are tied to the approval of plant protection products. Distance from the adjacent biotope has a maximum of 20 m[43]. Relevant factors: There is no evidence whether wild pollinators were discussed or not.
Greening: permanent grassland rules	*a.) Whether to protect permanent grassland from ploughing completely by designating it as ESPG*	<u>Germany</u> a.) Permanent grassland is not entirely protected from ploughing by designating it as ESPG (Environmentally Sensitive Permanent Grassland). There are a few federal states who have protected all permanent grassland from conversion by separate state rules, for example Baden-Württemberg[44], Mecklenburg-Vorpommern[45] and Schleswig-Holstein[46].

42 MLR (2019a), p.30.
43 LTZ (2019): Abstandsauflagen im Ackerbau. Präsentation. Download at: http://www.ltz-bw.de/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/ltz_ka/Arbeitsfelder/Pflanzenschutz/Ger%C3%A4tetechnik/Abstandsregelungen/Schutzbestimmungen-f%C3%BCr-Gew%C3%A4sserorganisemen-und-terrestrischer-Bioz%C3%B6nosen_DL/Ackerbau_Abstandsauflagen.pdf?attachment=true, slides 6-7.
44 §27 a - Schutz von Dauergrünland - LLG (Landwirtschafts- und Landeskulturgesetz) at http://www.landesrecht-bw.de/jportal/?quelle=jlink&docid=jlr-Lw_KultGBWV23P27a&psml=bsbawueprod.psml&max=true.
45 Gesetz zur Erhaltung von Dauergrünland im Land Mecklenburg-Vorpommern (Dauergrünlanderhaltungsgesetz - DGErhG M-V) vom 10. Dezember 2012 at http://www.landesrecht-mv.de/jportal/portal/page/bsmvprod?feed=bsmv-lr&st=lr&showdoccase=1&paramfromHL=true&doc.id=jlr-DGr%C3%BCnErhGMVV3P1.
46 Gesetz zur Erhaltung von Dauergrünland. (Dauergrünlanderhaltungsgesetz - DGLG) Vom 7. Oktober 2013 at http://www.gesetze-rechtsprechung.sh.juris.de/jportal/?quelle=jlink&query=DGr%C3%BCnErhG+SH+%C2%A7+10&psml=bsshoprod.psml&max=true.

		Not all of the important Annex I grasslands are designated as ESPG. In Germany, all Annex I grassland habitats inside a designated Flora Fauna Habitat Directive area (SAC) are designated as ESPG. All Annex I grassland habitats lying outside designated Flora Fauna Habitat Directive areas are not designated as ESPG[47]. In the explanatory statement of the Federal Council on the introduction of the plow regulation pollinators and their needs are not mentioned. There is no relation to insect death [48]. Relevant factors: There is no evidence whether wild pollinators were discussed or not.
Ecological Focus Areas	*a.) Was the pesticide ban on nitrogen-fixing crops communicated as being good for pollinators and* *b.) were pollinator-friendly N-fixing crops included?* *c.) Whether to allow hedge, tree and tree patch landscape features to count towards the greening EFA requirements.* *d.) Whether to allow fallow with naturally developed vegetation to count towards the greening EFA requirements* *e.) Whether to allow forest edges,* *f.) short rotation coppice,*	<u>Germany</u> a.) The pesticide ban on nitrogen-fixing crops was not communicated as being good for pollinators. b.) Yes, pollinator-friendly N-fixing crops were included. According to a (pollinator-) expert[49], the following of the permitted species[50] are often visited by pollinators: *Lotus corniculatus*, *Medicago sativa*, *Melilotus* ssp., *Trifolium pratense* und *Vicia villosa*. c.) Landscape elements protected under Cross Compliance (see above (p. 12)) can be counted as EFA[51]. d.) Yes, fallow with naturally developed vegetation counts towards the greening EFA requirements. Fallow land that is to be counted as EFA must either be left to spontaneous re-vegetation or be greened by selective sowing. A disadvantage for pollinators, however, is the maintenance obligation, because the growth must be either mulched and spread over the entire area or mown and removed [52]. e.) No, forest edges do not count towards the greening EFA requirements. f.) Yes, short rotation coppice counts towards the greening EFA requirements. g.) No, agroforestry does not count towards the greening EFA requirements. Yes, environmental afforestation counts towards the greening EFA requirements[53].

47 Papst et al 2017
48 Bundesrat (2018): Drucksache 61/18 at https://www.rieger-hofmann.de/fileadmin/data/downloads/Bundesrat_Drucksache_61_18.pdf (pp. 12-13).
49 Hr. Schanowski (ILN Bühl), telephone interview 07.05.2019.
50 BMEL (2015), p.113.
51 BMEL (2015), pp.47, 48.
52 BMEL (2015), pp. 46-47.
53 BMEL (2015), pp. 50-51.

	g.) agroforestry and *h.) environmental afforestation to count towards the greening EFA requirements.*	Relevant Factors: With the adoption of the new melliferous fallow option in 2018, the following factors relevant to pollinators were discussed[54]: - Composition of plant species to ensure year-round flower availabilityGeneral positive effects on biodiversity - For reasons of biodiversity, sowing in the first year is regarded as an agricultural activity within the meaning of § 2 DirektZahlDurchfG, so that the maintenance obligation does not apply until the second year.
Pillar 1 eligibility rules	*a.) Whether the Member State has chosen to extend its definition of "permanent grassland" to include other land on which traditional grazing practices take place.* *b.) Whether the MS has chosen to protect grassland from ploughing without re-seeding, and from conversion to arable, by defining "permanent grassland" to include traditionally grazed areas.* *c.) Whether to define the eligibility rules for wooded agricultural land to help support the viability of wood pasture farming systems*	<u>Germany</u> a.) Yes, Germany has chosen to extend its definition to include other land on which traditional grazing practices take place. b.) No, Germany did not choose to protect grassland from ploughing. *c.)* The newly introduced "100-Trees Rule" allows agricultural activities on areas where max. 100 trees (previously 50 trees) per hectare, under the same conditions as non-tree parcels in the same area (see Article 9 (3) Delegated Regulation (EU) No 640/2014). In addition, the entire grazing area under the trees must be covered by a vegetation that is possible to graze and be accessible to the grazing animals. The reasoning of the German Bundestag for the current permanent grassland regulation mentions the necessity to create financial incentives in order to ensure the agricultural use of these – from environmental and nature conservation aspects – valuable areas. Pollinators are to be mentioned among the environmental and nature conservation aspects[55]. Relevant factors: The needs of pollinators were not discussed.

54 Bundesrat (2018): Drucksache 61/18 vom 26.02.2018, Dritte Verordnung zur Änderung der Direktzahlungen-Durchführungsverordnung und der InVeKoS-Verordnung at https://www.bundesrat.de/SharedDocs/drucksachen/2018/0001-0100/61-18.pdf?__blob=publicationFile&v=1

55 Deutscher Bundestag (2014): Drucksache 18/908 at http://dip21.bundestag.de/dip21/btd/18/009/1800908.pdf; p. 22.

Part 2: Advice made available to land managers to help them encourage pollinators

In Germany, the Farm Advisory Service (official advisory service) traditionally takes the form of advice in the public interest or on the state's behalf by the agricultural authorities. Advice on the protection of pollinators is not one of their tasks.

Table 1 (see above) also mentions the possibilities of RDP-support for advice and training (M1 / M2). Additional qualifications within M1 (Saxony) or M2-consultations (Baden-Württemberg, Lower Saxony, Mecklenburg-Vorpommern, Rhineland-Palatinate) are also offered to promote nature conservation or biodiversity. Offers specifically offered for wild pollinators do not exist[56]. Also, in this context, wild pollinators are not mentioned in any of the RDPs.

In **Baden-Württemberg**, advisory services for farmers are available since 2015 (RDP measure M2). Of the 66 advisory modules currently offered, two have named biodiversity as a topic[57], in the following these are summarized as biodiversity consultation. Since wild pollinators are part of biodiversity, these advisory modules are analyzed in more detail below. The increased attention that wild pollinators receive in biodiversity advice is addressed in Table 1 (see above). The telephone interviews with the consulting organizations were helpful (see Part 2).

The advisory services in the frame of the biodiversity consultation include a two to three-hour visit on farm, based on which a farm-specific action plan is worked out by the consultant and handed over to the farmer. Smaller questions might also be answered by telephone. Associations that conduct biodiversity consultations provide their members information on biodiversity-promoting measures via the internet, newspapers, and meetings.

Participation in the biodiversity consultancy is open to all farms in Baden-Württemberg. In principle, all types of farms request biodiversity consultations. There is no evidence for a tendency towards a specific type of farm system. None of the

56 See https://www.netzwerk-laendlicher-raum.de/themen/naturschutzberatung/beratung-in-den-laendern/, last access 29.05.2019.

57 MLR (Ministerium für Ländlichen Raum und Verbraucherschutz, 2018c) Biodiversitätsberatung – Vielfalt der Natur und Landschaft erhalten und fördern (leaflet) https://www.km-bw.de/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/lel/Abteilung_3/Kultur-%20und%20Erholungslandschaft/Dokumente/Biodiversit%C3%A4tsberatung/GBB_2018_gesamt.pdf.

consulting organizations was aware of a request in which a biodiversity consultation was carried out specifically for the promotion of pollinators.

A total of 10 consulting organizations have been approved by the state of Baden-Württemberg to carry out a biodiversity consultation (as of 2018). Of these, 8 organizations are primarily from the agricultural sector, 4 of these are assigned to organic farming. The other two organizations come from the field of environment and nature[58]. None of the consultants stated that they are specialized in pollinators, so it can be assumed that the consultants usually have no special training. The consulting service Ökologischer Obstbau e.V. stated that there is a regular exchange of expertise with scientists from the University of Hohenheim, who coordinate the nationwide "practical program for increasing ecological diversity in organically farmed fruit production plants"[59].

According to the interviewed consultants, the content of the advice varies according to region and farm. In general, it is analyzed where and how a stronger promotion of biodiversity on the farm is possible. On this basis, a farm-specific action plan is developed, which also shows the agricultural management which supports biodiversity[60].

The interviewed consultants state that there is a good chance of success in implementing the measures proposed within the biodiversity consultation, as all farmers have a self-interest in the topic. The main objective of the consultation is usually implemented through appropriate measures at short notice after the consultation – a finding that advisors observed during the 12-month consultation phase. The implementation of further measures from the farm-specific action plan may then takes place in the medium or long term [61].

Between 2015 and 2018, 50 biodiversity consultations were funded in Baden-Württemberg. This equals about 0.1% of the 40,600 farms in Baden-Württemberg.

58 MLR (Ministerium für Ländlichen Raum und Verbraucherschutz, 2018c): Biodiversitätsberatung – Vielfalt der Natur und Landschaft erhalten und fördern (leaflet) https://www.km-bw.de/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/lel/Abteilung_3/Kultur-%20und%20Erholungslandschaft/Dokumente/Biodiversit%C3%A4tsberatung/GBB_2018_gesamt.pdf.
59 https://biodivobst.uni-hohenheim.de/flyeroeko.pdf.
60 MLR (2018c).
61 Interview with Mr. Pape von grünweg.

Since 2018, the consulting organizations have noted a trend of increasing demand. One consulting organization noted that much less demand could be expected without the current 100% funding.

There is no advice or training on the conservation of wild pollinators provided under the RDP.

There are various diffuse sources of information and offers for those who are open and interested in pollinators. Examples of these sources are:

- The NGO Mellifera e. V., headquartered in Baden-Württemberg, is the initiator of the Germany-wide "Network Blooming Landscape". Purpose is among others the improvement of habitats for pollinators[62].
- The University of Hohenheim is home of the State Institute of Bee Science Baden-Württemberg. The institute offers seminars on wild bees for interested people[63].
- The Ministry of Rural Areas and Consumer Protection Baden-Württemberg has published the fifth edition of the “bee pasture catalogue” in 2018[64]. It proposes the following measures for farmers on arable land:
    - Sowing of flower mixtures
    - Growing flowering crops
    - Mixed cultivation
    - Growing of catch crops and the use of under sowing
    - Non-application or reduction of herbicide use
    - Conservation and maintenance of field margins (conservation headlands)

62 http://www.bluehende-landschaft.de
63 https://bienenkunde.uni-hohenheim.de/fileadmin/einrichtungen/bienenkunde/Downloads/Sonstiges/2018_Flyer_Bienen_LVG_StandJuli_druck.pdf
64 MLR (Ministerium für Ländlichen Raum und Verbraucherschutz Baden-Württemberg, 2018d): Bienenweidenkatalog at https://mlr.baden-wuerttemberg.de/fileadmin/redaktion/m-mlr/intern/dateien/publikationen/Bienenweide-Katalog.pdf.

- Sparsely vegetated strips in arable fields
- Bee banks
- Margin habitats and small biotopes

Further, it proposes the following measures for farmers on grassland:

Conservation/Maintenance of species- and flower-rich grassland

Support of pollinators in intensively used grassland, e.g. mowing after flowering of *Taraxacum* agg.

Avoidance of animal losses during mowing

Re-establishment of flower-rich grassland

Part 3: What is the impact on wild pollinators of including or excluding traditionally grazed heathlands or scrub as "permanent grassland"?

Prior to the extended definition of permanent grassland by § 2 DirektZahlDurchfG in Germany in July 2104, high-quality heathland with a share of grasses <50% did not count as permanent grassland, whereas heathland with a share of grasses> 50%, i.e. heath in a poor nature conservation status, could be credited as permanent grassland. This was a counterproductive regulation for the conservation of Natura 2000 heath habitat types.

Since July 2014, the extended definition of permanent pasture according to § 2 DirektZahlDurchfG applies: "*Permanent grassland within the meaning of Article 4 (1) (h) of Regulation (EU) No 1307/2013 also includes areas that can be grazed and part of the established local practices where grass and other grassland plants traditionally do not predominate in pasture areas*"[65]. These two circumstances are summarized under the term "established local practices […] in pasture areas" (see EU 639/2014 (7)) [66]. This definition concerns a large part of heathlands valuable

[65] Gesetz zur Durchführung der Direktzahlungen an Inhaber landwirtschaftlicher Betriebe im Rahmen von Stützungsregelungen der Gemeinsamen Agrarpolitik (DirektZahlDurchfG), at http://www.gesetze-im-internet.de/direktzahldurchfg/ (last update 22.05.2019).

66 DELEGIERTE VERORDNUNG (EU) Nr. 639/2014 DER KOMMISSION vom 11. März 2014, at https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:32014R0639&from=DE.

for nature conservation, including all heathlands mapped as Natura 2000 habitat types (see below).

The preservation of the valuable habitats resulting from the traditional grazing of these sites would not be worthwhile for farmers without the direct payments and, where appropriate, the compensatory payments. After all, the sum of direct payments and the compensatory payments amounts to about 500 € / ha. The promotion rates for nature conservation from the second pillar of the CAP alone are usually not sufficient for farmers to cover the costs of grazing such habitats [67].

In the course of the intensification of agriculture in Baden-Württemberg, traditional grazing in many areas has been abandoned in recent decades, with the consequence that these areas are now forested. The relevance of former agricultural land for the individual pollinating insect species has changed as succession has progressed. There is no question that the remaining heath and scrubland are important habitats for pollinators. The majority of the dry heaths (Trockene Heiden - Habitats Directive type 4030) and a good half of the calcareous grasslands (Kalk-Magerrasen - Habitats Directive type 6210) in Baden-Württemberg are in designated Directive areas (Natura 2000 sites). In these areas, maintenance is ensured by the Landschaftspflegerichtlinie (LPR). For the maintenance of these habitats outside the protected areas, maintenance is only carried out on selected, particularly valuable areas.

The permanent grassland definition is included in the justification of the Federal Government on the proposed legislation for the implementation of direct payments to farmers within the framework of support schemes of the CAP (Direct Payments Act - DirektZahlDurchfG). It states that the definition for permanent pastures will allow direct payments for traditional grazing areas, such as heathland. The need for this definition lies in the creation of a financial incentive so that the land will be used agriculturally for reasons of environmental and nature conservation further on[68].

The wild pollinators were not explicitly mentioned in the justification. Several interviewees also confirmed that pollinators did not play a special role at the time of the design of the current CAP.

Telephone interviews identified further difficulties in implementing traditional (extensive) grazing:

67 Phone interview with Mr. Güthler (StMULV), 08.05.2019.
68 Deutscher Bundestag (2014): Drucksache 18/908 at http://dip21.bundestag.de/dip21/btd/18/009/1800908.pdf (p. 22).

- Lack of clarification of the definition of grazeable vegetation

Regarding the definition of grazeable vegetation legal clarity exists only for heath. In § 2 DirektZahlDurchfG it says: "[...] as permanent grassland [...] are considered also areas, which can be grazed [...]"[69]. As the justification to the proposed legislation on Direct Payments shows, there is agreement that heath can be grazed (see above). No specifications are given for other grazeable vegetation types. There is a lack of clarity in grassland areas dominated for example by dwarf shrubs and woody plants (Luick et al 2015).

- Nature conservation and European law requirements for extensive pastures

Favorable ecological and structural characteristics of extensive grazing systems generally do not meet the expected European requirements for the management and control of agricultural land, according to the interviewees.

While the eligibility criteria under European law favor the definition of grassland areas with homogeneous vegetation cover as well as simple and clearly definable structures, the viewpoint from nature conservation and thus also from many pollinators other characteristics (heterogeneity) are worth striving for. The nature conservation requirements include, among others, irregular shapes with flowing transitions, small-scale grazing elements in different succession stages and high spatial and temporal dynamics (Luick et al 2015).

Their registration as eligible landscape elements or as ineligible wood structures (exceeding the maximum area size, or share) and the annual control of compliance with the eligibility criteria is not only very complex for the farmer, but also administratively very complex for the competent authorities [70]. By creating an extra regulation for extensive pasture systems, the current complexity could be overcome in the new CAP. A specific approach for extensive pastures could in-

69 DirektZahlDurchfG, at http://www.gesetze-im-internet.de/direktzahldurchfg/ (last access 22.05.2019).
70 Phone interview with Mr. Güthler (StMUV).

clude that the digitization of landscape elements is no longer mandatory, accounting for the high dynamics of these habitats. Accordingly, an adapted rate of support applicable only to these areas would need to be paid[71].

- "established local practices" and protected species

Partly, the EU instruments lead in the opposite direction, specifically the CAP and Habitats Directive. Traditional grazing systems needed for the conservation of semiopen grazing landscapes with many habitat transitions (as required by some pollinating insects protected under the Habitats Directive) are not supported or only supported under difficult circumstances in the current CAP. On the other hand, some of these pollinators are to be preserved in a favorable conservation status. As some of these pollinators depend on the semi-open structures and dynamic transitions (e.g. *Lycaena dispar* and *Maculinea arion*), the achievement of the conservation status would benefit from extensive grazing. For this, however, the dynamic processes and heterogeneity of extensive pastures would need to be better accounted for in the next support scheme[72].

Part 4: The effectiveness of actions and schemes deliberately intended to help pollinators

A.) agri-environment (M10) option for flowering margins or fallows: FAKT-measure E2 “Greening of fallow land with blooming mixtures” of Baden-Württemberg

The implementation of flower strips / areas as an AECM is offered in almost all German states (see Part1). This type of measure is considered as representative for all of Germany using the example of the FAKT measure E2 "Greening of fallow land with blooming mixtures" from Baden-Württemberg. Similar positive effects on wild pollinators are to be expected from the range of measures for flower strips / areas of other federal states (see Table III).

The reasons for its introduction are described in FAKT brochure as followed:
‘Farmland lying fallow is used by many animals such as hares, pheasants, partridges and other ground breeders as protection and retraction area. Seeding with

[71] Phone interview with Mr. Güthler (StMUV).
[72] Phone interview with Mr. Güthler (StMUV).

blooming mixtures serves as a high-quality food source for insects and especially wild bees. Furthermore, the nutrient outflow into groundwater and surface water as well as ground erosion is reduced. In addition, the multitude of colors on the farmland characterizes the landscape.'[73]

Flowering strips have been offered in Baden-Württemberg since 2007 as an AECM. Over the years, the design of the measure has been slightly advanced.

E2.1 - Greening of fallow land with blooming mixtures without EFA crediting

- Seeding of predetermined one- or perennial blooming mixtures on farmland excluded from production; seeding in autumn of the previous year until 15th of September (perennial) or in spring until latest 15th of May
- Mulching / incorporation of the plants not before the end of November or in September when cultivating winter crop
- No use of nitrogenous fertilizers and pesticides
- The annual payment is 710€/ha[74]

E2.2 - Greening of fallow land with blooming mixtures with EFA crediting

- The requirements of E2.1. must be met. The only difference is: incorporation with a following summer crop not before the 1st of January of the following year
- The annual payment is 330€/ha[75]

There is no targeting to a special project area or type of farming system. The FAKT-measure E2 'Seeding of blooming mixtures' is only possible on arable land without current production.

No information is given by the administration of Baden-Württemberg on affected pollinator species. Studies on different flowering seed mixtures have shown that specialized wild bees benefit most from herb-rich and multiannual mixtures (Oppermann et al 2013). We can therefore assume that specialized wild bees also

[73] MLR (2017), pp. 12-13.
[74] MLR (2017), p. 19.
[75] MLR (2017), p. 19.

profit from the newly introduced AECM E7 in Baden-Württemberg, compared to annual flower areas/strips (E2). The project ‚Ecological enhancement of farmland in the Upper Rhine Valley shows the effects of a network of flowering areas/strips on wild bees and butterflies (Buhk et al., 2018; Bayer AG, IFAB Mannheim & ILN Bühl, 2017) 55. Within the project, 10% of the arable area was enhanced through flowering areas/strips.

However, this study does not investigate specifically the AECM E2.1 and E2.2 of Baden-Württemberg, but a variety of seeding mixtures. The study showed that with the introduction of multifactual seed mixtures, with a differentiation of the mixtures (different mixtures seeded in parallel in the enhancement areas) and with having multiannual seed mixtures in the field throughout the years a multiple effect in wild bee numbers and abundances could be achieved (compared to seeding only the mixture E2.1 or E2.2). However, such a differentiated design will only be implemented by farmers who are already aware of the benefits, and who get an on-site support. Besides advisory services, the programming of the AECM needs to enable such complex designs. The additional effort for sowing and advisory services should be considered in the payment scheme.

In total there are around 5,400 farmers in Baden-Württemberg who applied for this FAKT-measure E2 (2017). Over a contractual period of 5 years, farmers annually sow flower strips / areas. This does not necessarily have to be done on the same field. For sowing, one of the three specified annual or annual flowering mixtures (M1 – with cruciferous plants, M2 – without cruciferous plants or M3 - winter-hardy) must be used and sown out on arable land taken from production. An annual seeding takes place till 15th May (M1 and M2) or in autumn of the previous year till 15th September (M3 – perennial winter-hardy mixtures). Farming stops until the end of November, if a summer crop follows. For measure E2.2 (with EFA crediting) the groundwork following mulching can only take place after 1st January of the following year. In both cases E2.1 and E2.2, the parcel can be used for winter crops after 15th September. The use of N-fertilisers and pesticides is not permitted.

Impacts on wild pollinators: In the study mentioned above (Buhk et al 2018, Maus et al 2017), there were clear positive impacts on wild pollinator abundances and species richness. However, it must be clearly stated that in the project areas (2 sites of 50 ha each) an extent of 10 % of the arable land was seeded with different and multiannual seed mixtures – thus the results cannot be transferred to the

normal practice (in total there are 1.5 % of the arable land covered with annual seed mixtures). Based on the findings from the project 'Ecological enhancement of farmland in the Upper Rhine Valley", impacts of flowering areas on wild pollinators can be described as follows:

- Some of the endangered wild bee species were found only in the sampling areas of the ecological enhancement area.
- Before sowing the flowering mixtures, the average number of wild bees per sample area in the control area was the same as in the area with measures. Both in the control area and in the enhanced area, the planting of flower strips / areas led to an increase in the average number of wild bees. However, the enhancement area showed an average number of wild bees at least five times higher compared to the control area.
- The brochure provides a detailed overview of the results of the effects of flowering strips / areas on wild bees and butterflies in the context of the research project (Bayer AG, IFAB Mannheim & ILN Büh 2017).

Success factors: The area size of the AECM "Blooming strip / area" in Baden-Württemberg has been increased from approx. 3,600 ha in 2010 (GAP 2007-2013) to 12,820 ha in 2017 (GAP 2014-2020). A report evaluating the RDP called MEPL III of Baden-Württemberg identified three success factors through an experts' consultation (including farmers). The named success factors for a good acceptance are (1) a higher support rate (compared to the previous rate of 500€/ha), (2) the option to implement the measure as EFA and (3) to improve its own image as farmer through flowering areas[76]. The option to register the measure as EFA offers farmers the possibility to suppress weeds by sowing of blooming mixtures on fallow land and getting financial support at the same time. In addition, pollinators would benefit much more from a funding of perennial flower strips / area than from annual ones, whether with or without EFA crediting. Thus, the efficiency of the budget dedicated to flower strips could be

76 Bewertung des Maßnahmen- und Entwicklungsplans Ländlicher Raum Baden-Württemberg 2014-2020 (MEPL III) at https://www.landwirtschaft-bw.info/pb/site/pbs-bw-new/get/documents/MLR.LEL/PB5Documents/mlr/MEPL/mepl_extern/MEPL_Monitoring/Evaluierung%202016/Bewertungsbericht_2017_MEPL%20III.pdf?attachment=true (pp. 169 and 181).

strongly increased when bi—and multifunctional flower strips are supported (instead of annual flower strips.

However, 12,820 ha only correspond to a share of approx. 1.5% of arable land in Baden-Württemberg, compared to 10% of arable land which was enhanced with flowering areas / strips in the research project 'Ecological enhancement of farmland in the Upper Rhine Valley'. The success for the biodiversity of wild bees and butterflies in the pilot project Upper Rhine is based on the following factors:

- Blooming strips / areas on 10% of arable land
- Continuous supply of flowering plants thanks to the combination of one-, multi- and perennial blooming strips / areas
- Cross-linking of the flowering areas in the landscape, so that the distance of travel for pollinators is low (Maus et al 2017)
- Individual and annual detailed management of the areas in cooperation with the farmer.

B.) agri-environment (M10) option for late mowing of grassland (extensification of grassland management)

Late mowing of grassland is offered in some German states. In Baden-Württemberg, late-mowing measures are only agreed in certain nature conservation contracts according to LPR. Otherwise, a differentiated approach to promoting the use and maintenance of species-rich grassland is pursued. This is reflected in the number of different AECMs of the FAKT and measures of the LPR (see Annexes IV and V). There is no request of this AECM measure from organic farmers.

The variety of measures is revealed by the diversity of factors that influence the biodiversity of grasslands. In addition to the location factors, the cultivation method has a great influence on the species composition. Drobnik & Poschlod (2011) investigated the effect of cutting time on butterflies. For butterflies, a flowering offer over the entire growing season is necessary. This can be achieved by coexistence of differently used grassland areas, such as, for example, phased mowing, fallow land and / or uncut edges. If only one butterfly species is to be promoted, the determination of cutting times is useful, such as for the conservation of *Maculinea nausithous* and *M. teleius*.

Summary

The agri-environment programme description lists the expected benefits from extensification of grassland management, cover crops, and flowering margins for pollinators. Agri-environment (M10) option for flowering margins or fallows is targeted at insect pollinators. Agri-environment (M10) option for late mowing of grassland is expected to benefit pollinating insects. Both options are combinable with other support under the CAP (first option with EFA requirement and second option with organic farming), which might make them more attractive to farmers. Researchers monitor the flowering margins and fallows option.

Apart from a few exceptions, wild pollinators and their needs were not explicitly taken into account for the implementation of the current CAP (2014-2020). One of the few exceptions is the rationale for the AECM flower strips / areas, which lists pollinators and their claims. This AECM is only implemented on approx. 0.5% of arable land in Germany. Even if pollinators and their needs were not explicitly taken into account, they also benefit from other AECM, such as extensive grassland management measures.

In general, there is no explicit advice to farmers or land users for the promotion or protection of wild pollinators takes place in Germany (via official advisory services or the training and counseling offer of the RDP [M1 / M2]). Possibly they can be part of a biodiversity or nature conservation consultancy (M1, M2).

Due to the extension of the grassland definition in 2014 (implementation of Regulation (EU) No. 1307/2013 into national law), heathland in Germany is eligible in payment schemes. The general environmental and conservation value of heathland was mentioned in the justification for transposing the EU legislation into national law, but pollinators and their needs were not considered in more detail.

Wild pollinators benefit from the AECM flower strip / area. The extent to which this is the case depends on the design (annual / perennial, composition of species, location, and implementation of the measure as well as the proportion of arable land on which the measure is implemented). These multiple factors also apply to the extensive use of grasslands. For both measures, a supply of flowering plants during the entire growing season is an important prerequisite for most of the wild pollinators.

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2.5 Romania

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Purpose of this Case Study

This case study aims to provide a short analysis of the extent to which Romania has tried to integrate and improve conservation conditions for wild pollinators during a) the CAP 2014-2020 programming period and b) the early years of CAP implementation in 2014 / 2015. The report follows the template provided by IEEP and is structured into 4 sections:

- **Part 1**: Identification of whether pollinator considerations played a part in how Romania took a range of CAP implementation decisions identified by IEEP as potentially affecting wild pollinators
- **Part 2**: Investigation of the advice available to land managers in Romania via the CAP about how to encourage (or avoid damaging) pollinators
- **Part 3**: Investigation of the available evidence in Romania (including views from stakeholders) of what the impact has been of including or excluding traditionally grazed heathlands or scrub as "permanent grassland" from receiving CAP payments (direct payments and/or AECM)
- **Part 4**: Brief assessment of the effectiveness of actions and schemes deliberately implemented in Romania with the intention to help pollinators.

Agricultural Context

According to the 2013 Farm Structure Survey[77], around 13.1 million ha of the total territory of Romania is Utilised Agricultural Area (UAA). Of this:

- 8.20 million ha (62.6%) is **arable land** - cereal grains, particularly maize and wheat, are the most important crops occupying around 60% of all arable land, followed by potatoes, sugar beet and industrial crops. Field-grown

[77] Eurostat (2015). *Farm structure survey 2013 - main results*. http://ec.europa.eu/eurostat/statistics-explained/index.php/Farm_structure_survey_2013_-_main_results (accessed: 12.05.2019)

vegetables (e.g. tomatoes, onions, cabbages and peppers) are also important;

- 4.40 million ha (33.6%) is **permanent grassland (pastures and meadows)** - a significant proportion of which are species-rich semi-natural grasslands of great significance for biodiversity conservation, including pollinators. Most grasslands are found in the more marginal, mountainous and sub-mountainous areas (e.g. Transylvania) where agricultural productivity is limited by high altitude, poor soils and slope;
- 0.30 million ha (2.3%) is **permanent crops** – notably orchards and vineyards.

Additionally:

- Around 228 000 ha (1.7%) is **under organic management**, of which 185 000 ha is in conversion (64.2%) and 103 000 ha was fully certified (35.8%), and;
- Around 1.83 million ha (14%) is **located within a Natura 2000 site**.

- **Biodiversity Context**

It is important to note that most of the research in Romania that has focussed on assessing plant-pollinator interactions (*Hymenoptera*, *Diptera* and *Lepidoptera*) has been undertaken in the traditional agricultural landscapes of Transylvania (e.g. Kovacs-Hostyanszki *et al.*, 2016). Relatively little work has been done in other regions of Romania.

There are no red lists of *Hymenoptera* or *Diptera* in Romania, and no data on pollinator abundance in these groups.

Of the estimated 2 048 species of wild bees in Europe, a total of 700 have been identified in Romania[78] during the last 150 years. A full bibliography of references to wild bees in Romania can be found here: http://www.beesofromania.ro/references (last accessed: 24.05.2019).

[78] From the Bees of Romania website maintained by Bogdan Tomozii, Curator of the Museum of Natural Sciences "Ion Borcea", Bacău. http://www.beesofromania.ro (accessed: 31.05.2019)

An online checklist of the 748 species of hoverflies (Syrphidae species) recorded in Romania can be found here: http://www.syrphidae.com/checklist.php?country=RO (last accessed: 24.05.2019).

Unlike the bees and flies of Romania, butterflies have been far more thoroughly assessed. A red list of the Romanian *Lepidoptera* (butterflies and moths) has been available since 2003 (Rákosy, 2003). Another, updated, list of Romanian Lepidoptera is in preparation and a distributional checklist of the Lepidoptera of Romania is understood to have been recently printed[79]. Similar publications are available (including also information on species distribution) for the moths of Romania (Rákosy, 2013).

The website of the Romanian Lepidopteran Society (http://www.lepidoptera.ro/english.htm) provides updates on various related publications, projects etc. and provides free access to studies which have been published in the *Entomological Information Bulletin* and *Entomologica Romanica*.

- **Public context**

There are an increasing number of informational / educational campaigns aimed at raising awareness of the importance of wild pollinators amongst the wider public (schools, universities, public authorities, citizens) – which in some cases may of also include farmers. For example:

- The Helmholtz Centre for Environmental Research Leipzig, Germany (in collaboration with the German Centre for Integrative Biodiversity Research and the Martin Luther University Leipzig, Germany) conducted a summer school on plant-pollinator interactions in Romania in 2017 and several projects are currently ongoing. Other projects that will involve cooperation with national museums and schools are also being developed.
- The Lepidopteran Society for Romania has conducted educational campaigns involving students from schools located in the managed Natura 2000 area of Dealurile Clujului Est (Eastern Cluj Hills) - see the website http://www.lepidoptera.ro/english.htm for details. This region is one of the

[79] Rakosy *et al.* (2019) – no additional information

eligible areas for **M10** (AECM) – package 6 - Grasslands important for butterflies (*Maculinea* sp.).

- E-consult Association, Satu Mare developed a project "Insect Hotels, an ecological and economic method for a sustainable agriculture". During the project, E-consult installed hotels for insects and organized raising awareness session for children and locals in Satu-Mare in the north of Romania.
- APPAPS.org (Asociatia Pentru Protectia Albinelor si Polenizatorilor Salbatici / Association for the Protection of Bees and Wild Pollinators) is a Bucharest-based NGO that organises awareness-raising campaigns (Save the bees today, Save the world tomorrow!) regarding the importance of bees and wild pollinators for people and the environment.
- SOR (the Romanian Birds Society) has prepared informational material[80] for the general which provides information about wild pollinators (pollinators species, trends and evolution in time of wild pollinators, trees and the actions that can be taken (e.g. garden plants) to attract and conserve wild pollinators.
- Starting with 2018 a "Pollinators Day" is celebrated on the 10th March in Romania. This public awareness event has been initiated by the Babes-Bolyai University in Cluj-Napoca in partnership with the Eotvos Lorand University in Budapest.

Part 1: Pollinator considerations in Romania's CAP implementation

National strategy towards pollinators

In accordance with the National Sustainable Development Strategy for Romania 2013-2020-2030 [81] and the National Action Plan on Biodiversity Conservation 2014-2020 the Romanian government aims to halt the decline of biological diversity of genetic resources and species. However, neither of these national strategic documents mentions wild pollinators or makes any reference to how the EU

[80] https://www.sor.ro/img/File/Proiecte/Gradina/Materiale/info_prezentare%20Insecte%20polenizatoare_RO.pdf

[81] http://www.mmediu.ro/beta/wp-content/uploads/2012/06/2012-06-12_dezvoltare_durabila_nsdsenglish12112008.pdf

Pollinators Initiative will be implemented in Romania. There only exists a national strategy aimed at the European honeybee (*Apis mellifera*) [82].

Management plans for most protected areas (covering 23% of the territory of Romania) include measures favourable for the conservation of pollinators. Specific regional plans are also available for certain protected species (e.g. *Maculinea* butterflies).

The main Romanian environmental NGOs (WWF Romania and BirdLife Romania) have urged several times the Ministry of Environment and Ministry of Agriculture for the immediate development of a national strategy for wild pollinators protection. They have also identified that action plans aimed specifically at bees and flies are also urgently needed.

Relevant initiatives

Some random initiatives of relevance to pollinators exist, however there is no correlation between these initiatives. For example, a reference to wild pollinators could be found in the Sectorial Plan for Research and Development in Agriculture and Rural Development 2015-2018 developed by the Ministry of Agriculture and Rural Development (MARD) through the ADER 3.1.1 Project called "Conservation and Management of genetic resources and biodiversity of vine-tree agroecosystems by developing and promoting innovative and eco-friendly practices and methods" 83. The project aims to develop solutions for the ecological reconstruction of degraded vineyards and fruit trees and for stopping the decline of the wine and fruit-growing ecosystems biodiversity. One of the project results is to contribute to increasing the number of pollinating insects, but it remains unclear whether this element of the project has been taken seriously.

More importantly, the *Pesticide Action Plan for Romania*[84] was recently adopted by the Romanian government (via Government Decision 135/2019) in accordance with the EC Sustainable Pesticides Directive. In addition to the legal provisions for promoting integrated pest management and controlling the risk of environmental pollution from plant protection products, the *Action Plan* specifically aims to reduce the impact of plant protection substances on pollinating insects. This includes both protecting pollinators from the effects of foliar pesticide application (i.e. when spraying) and acknowledging the importance of buffer strips, hedges,

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[82] Available at: http://www.madr.ro/programul-national-apicol.html

[83] Available at: https://www.madr.ro/cercetare-inovare/ader-2015-2018/ader-3.html

[84] http://www.anfdf.ro/utile_files/HG_135_12.03.2019_PNA.pdf

trees and wood patches etc. as important feeding and protective areas for pollinators.

The responsible government body for implementation of the *Pesticide Action* is the National Phytosanitary Authority (www.anfdf.ro).

- **CAP implementation choices**

Pollinators are not mentioned specifically in the *National Rural Development Plan 2014-2020 for Romania* (MADR, 2019), but the importance of **M10** (AECM), **M08** (afforestation) and **M15** (Forest-Environment-Climate) for the *"maintenance and development of insect populations"* is consistently highlighted, with a specific emphasis upon the two HNV grassland packages (sub-measures) under **M10**. There is also a dedicated package under M10 targeting around 23,000 ha of permanent grasslands important for butterflies (*Maculinea sp.*) with payments for the maintenance of traditional management practices.

Table 1 summarises the CAP 2014-2020 measures and decisions taken by the Romanian government that have the potential for beneficial impact upon the conservation of wild pollinators.

Table 1: *CAP measures which can affect wild pollinator habitats*

CAP measure	Programming decisions	Relevant factors
Farm Advisory Service RDP support for advice and training (M1 / M2)	Whether to offer advice or training through FAS, M1 or M2 on: • how to manage species rich grassland so as to encourage pollinators • the creation and management of pollinator borders, in field strips or buffer strips so as to encourage pollinators • creation and management of pollinator-friendly arable fallow • pollinator-friendly creation and management of hedges, trees and wood patches • the management of heath and scrubland to promote pollinators	According to the Ministry of Agriculture and Rural Development (MARD), the overall stated objectives of the Farm Advisory System (FAS) in Romania is *"…the provision of consultancy, information and training for farmers"* with specific emphasis upon *"…subsistence farms, young farmers, small and medium-sized farms"* (MADR, 2015). The main themes chosen by MARD for the FAS are as follows: • ecoconditionality and environmental protection rules and requirements; • reduction of greenhouse gas emissions; • mitigation of climate change; • sustainable management of resources; • promotion of NRDP measures 2014-2020; • technology transfer and innovation in agriculture; • various forms of producer certification, and; • preparation of "development projects" for the improved organisation, management and use of permanent meadows. These are all broadly in accordance with the mandatory and optional domains identified in Art. 12 of EC Regulation No. 1306/2013. **There is no specific mention of providing advice on issues of direct relevance to pollinators or pollinator habitats**.

CAP measure	Programming decisions	Relevant factors
	• ways to manage forest land to promote pollinators	The National Rural Development Programme 2014-2020 for Romania (MADR, 2019) includes three FAS related sub-measures: • **M1.1** (Support for vocational training and skills acquisition actions) - vocational training for farmers with commitments in M10 (AECM) and M6 (Farm and business development) • **M1.2** (Support for demonstration projects/information actions) – range of specific information actions for farmers (e.g. biosecurity for pig farms) and specific focus on demonstration actions for beneficiaries of M11 (organic farming) • **M2.1** (Support to help benefit from the use of advisory services) – provision of advisory services to support farmers a) with AECM commitments and b) wanting to develop partnerships, notably cooperatives **There is no specific mention in the documentation relating to sub-measures M1.1, M1.2 and M2.1 of providing information, demonstration on issues of direct relevance to pollinators or pollinator habitats**.
Agri-Environment Climate Measure (AECM) and linked non-	Whether to offer AECM support for biodiversity-friendly grassland management practices & whether management requirements consider pollinator relevance	There are a **total of five M10 sub-measures (so-called packages)** offering support for biodiversity-friendly grassland management practices. **M4.4** is not programmed. One of these sub-measures – namely **Package 6 – Grasslands important for butterflies (*Maculinea* sp.)** – is targeted specifically at pollinators (see Part 4 for more explanation). The other four are not targeted at pollinators, but all promote the maintenance of traditional grassland

CAP measure	Programming decisions	Relevant factors
productive investments (M4.4) (e.g. for habitat creation and restoration)		management practices and/or prohibit the use of pesticides and are thereby potential of direct benefit for pollinators: • **Package 1 – High Nature Value (HNV) grasslands** • **Package 2 – Traditional agricultural practices** - offered in combination with Package 1 to maintain traditional hay-making practices • **Package 3 – Grasslands important for birds** • **Package 9 - Agricultural land important as feeding area for the Lesser Spotted Eagle *(Aquila pomarine)*** – notably sub-package 9.2 (permanent grasslands) Additionally, there are two sub-measures (**Packages 6.1** and **6.2**) of **M11 (Organic farming)** which are targeted at the conversion to (P6.2) / maintenance of (P6.1) the certified organic management of permanent pastures. See **Annex 1** for a map showing the distribution of all permanent grasslands eligible for support under M10 and M11 in the *NRDP 2014-2020*. It should be noted that only two of the M10 grassland packages – **P1 (HNV grasslands)** and **P2 (Traditional agricultural practices)** may be combined. All other packages are available in discrete areas and do not overlap with any other

CAP measure	Programming decisions	Relevant factors
		package (see **Annex 1**). The **M11 grassland packages (P6.1 and P6.2)** can be combined with any of the **M10 grassland packages**.
	Whether to offer AECM funding for the creation of pollinator borders or strips on arable land	No such specific sub-measure or management requirement is included under **M10** (AECM). But **Package 10 – Habitats for common bird species associated with arable land** requires 30% of arable land to be left uncultivated (including the prohibition of pesticide use) every year, including 10% which is left fallow for at least 4 years and 20% which is rotational fallow. This has obvious benefits for pollinators, although it is not targeted specifically at them.
	Whether to offer AECM support for Integrated Pest Management and reduced pesticide use	No such specific sub-measure or management requirement is included under **M10** (AECM), although as noted above there are several packages (sub-measures) in which pesticide use is prohibited.
	Whether to support the creation, restoration and biodiversity-friendly management of hedges, trees and wood patches through the AECM.	No such specific sub-measure or management requirement is included under **M10** (AECM).
	Whether to offer AECM for the creation and maintenance of wildlife fallow, e.g. through natural regeneration over a year or more or with wild seed mixes for pollinators.	No such specific sub-measure or management requirement is included under **M10** (AECM).

CAP measure	Programming decisions	Relevant factors
	Whether to program AECM for restoration and maintenance of grazed heath and scrub habitats.	No such sub-measure or management requirement is included under **M10** (AECM).
Organic farming support	Whether pollinator conservation is mentioned as a reason for supporting organic farming.	Pollinator conservation is not mentioned specifically as a reason for supporting organic farming, but the programming of **M11** (organic farming) is strongly justified on the grounds of its contribution to biodiversity conservation – especially because it prohibits the use of pesticides
Other RDP measures	Whether to programme the RDP measures for agroforestry forest conservation, and environmental afforestation Whether to offer forest restoration support for the conversion of closed coniferous stands to open mixed deciduous forest	**M08** (afforestation) and **M15** (Forest-Environment-Climate) are both mentioned as for the *"maintenance and development of insect populations"*. Neither measures are targeted specifically at wild pollinators, but they do have the potential to benefit pollinating insects by rebuilding local habitats and ecosystems and creating transition areas. For example, the list of approved species in **M08** includes one species, willow (*Salix spp.*), which is particularly appropriate for creating friendly habitats for pollinating insects.
GAEC rules	Whether to protect buffer strips through cross-compliance by listing them under GAEC 7 (beyond what is legally required by Water Framework Directive rules and/or nitrate action plan rules).	The current (2019) requirements of **GAEC 7** are: 1. Preserve elements of the landscape, including isolated trees and existing terraces, that exist on agricultural land 2. Prevent the establishment of unwanted vegetation on agricultural land, including land which is uncultivated

CAP measure	Programming decisions	Relevant factors
	Whether to protect hedges, trees and tree patches from destruction by listing them as landscape features under cross-compliance GAEC 7, and whether any additional conditions are defined that might benefit pollinators.	3. Do not cut of wild hedges and trees during the breeding and rearing season of wild birds (15 March - 30 June)[85] Buffer strips are <u>not listed</u> under **GAEC 7** Landscape features are protected, but they are <u>only minimally defined</u> in the legislation as *"including isolated trees and existing terraces"*. Fortunately, the 71-page *Farmers' Guide to Cross-compliance* (MADR/APIA, 2019) that is available on the Paying Agency (APIA) website describes GAEC 7 in more detail and also lists / describes *"trees in alignment, isolated trees or tree groups"* together with detailed conditions for their maintenance. However, these conditions are of no specific benefit to pollinating insects.
Greening: permanent grassland rules	Whether to protect permanent grassland from ploughing completely by designating it as ESPG	The restriction on the cultivation of Environmentally Sensitive Permanent Grassland (ESPG) applies only to permanent grassland within Natura 2000 sites and to no other permanent grassland.
Ecological Focus Areas	Was the pesticide ban on nitrogen-fixing crops communicated as being good for pollinators	**NO** – the pesticide ban was not communicated as being good for wild pollinators, it was simply communicated as a new obligation in accordance with a Government Order.

[85] This has replaced the previous requirement (prior to 2019) that "**Permanent grasslands must be actively maintained by ensuring a minimum level of grazing of 0.3 livestock units/ ha and/or mowing at least once per year**"

CAP measure	Programming decisions	Relevant factors
	and were pollinator-friendly N-fixing crops included?	**YES** - linear landscape features, such as hedgerows, woodland strips and lines of trees are considered "arable land" when the long side of the feature is physically touching a parcel of arable land and as "adjacent arable land" when physically touching the arable land at least one point.
	Whether to allow hedge, tree and tree patch landscape features to count towards the greening EFA requirements.	**NO** – fallow land with naturally developed vegetation is not counted towards the EFA requirements
	Whether to allow fallow with naturally developed vegetation to count towards the greening EFA requirements	**YES** – areas of short rotation coppice and afforested areas are counted towards the EFA requirements, but subject to the following conditions: • Short rotation coppice is defined as areas grown with willow *(Salix spp.)*, white poplar *(Populus alba)* or Black poplar *(Populus nigra)* on plots with areas less than 0.3 hectares; • Afforested areas are only eligible if afforested with EAFRD support, either under **M221** (First afforestation of agricultural land) in the *NRDP 2007-2013* or under **M08** (Afforestation) in the *NRDP 2014-2020*. Parcels must have a minimum surface area of 0.5 ha.
	Whether to allow forest edges, short rotation coppice, agroforestry and environmental afforestation to count towards the greening EFA requirements.	
Pillar 1 eligibility rules	Whether the Member State has chosen to extend its definition of	According to the provisions of the Emergency Government Ordinance No. 3/2015 (for the approval of payment schemes applying in agriculture in the period 2015-2020):

CAP measure	Programming decisions	Relevant factors
	"permanent grassland" to include other land on which traditional grazing practices take place. Whether the MS has chosen to protect grassland from ploughing without re-seeding, and from conversion to arable, by defining "permanent grassland" to include traditionally grazed areas. Whether to define the eligibility rules for wooded agricultural land to help support the viability of wood pasture farming systems	• "Permanent grassland" follows the basic CAP definition and is understood to mean land (meadows and pastures) devoted a) to the production / growth of grass and other herbaceous forage crops which has not been part of a crop rotation system for at least 5 years and b) where other species, such as shrubs and trees, are growing and which are good for grazing - provided that grass and other forage species remain predominant (i.e. more than 50%). Romania has not adopted an extended definition of "permanent grassland" to specifically include other habitat types such as heathland and scrubland; • There is no specific mention of the protection of permanent grasslands from ploughing without reseeding or from conversion to arable; • From 2020, permanent grasslands containing 'non-eligible elements' – notably scattered trees in wooded pastures and meadows – will be eligible for payments by applying a "proportional surface reduction" (pro rata) scheme based upon the percentage of land occupied by these 'non-eligible elements' within any given physical block. This is a direct interpretation and application of Articles 9 and 10 of EC Regulation No. 640/2014. No specific reference is made to using this approach to help support the viability of wood pasture farming systems.

Part 2: Advice made available to land managers in Romania via the CAP to help encourage pollinators

- **Current State of the Farm Advisory System (FAS)**

For the 2014-2020 period the Ministry of Agriculture and Rural Development (MADR) has accredited a mixture of public and private entities as FAS providers – including:

- staff of the 41 county-level directorates of the Ministry of Agriculture and Rural Development and 280 local "technical assistance centres" (estimated to involve a total of around 480 advisers);
- 14 private agricultural chambers (of limited functionality);
- two key environmental NGOs (potentially very effective if properly re-sourced), and;
- a number of private consultancy companies listed on the Paying Agency website for writing project applications (notably M4 and M6).

Overall, the Romanian FAS is widely acknowledged as weak, fragmented and largely incoherent (Rusu, 2014; Toderiţă, 2019), with specific weaknesses regarding cross compliance and AECM. There are multiple factors that contribute towards this, including:

- The successive and still uncompleted reform / restructuring of the public advisory service since the 1990s[86]. A survey of commercial farmers undertaken in March 2013 by MARD revealed that many farmers are confused about where exactly to ask for information and knowledge (Stefanescu *et al.*, 2013)

[86] A centralized national agricultural advisory system was first created in 1998 under the co-ordination of the National Agency for Agricultural Consulting (ANCA) with a network of 41 County Centres (NUTS 3) for Agricultural Consulting (OJCA) and 500 Local Centres (LAU 2) for Agricultural Consulting (CLCA). This system was decentralized in 2001, centralised again in 2004 and then dismantled in 2010 with most of the former county OJCAs and local level CLCAs network transformed into 41 Chambers of Agriculture (*Camera Agricolă*) subordinated to the County Councils. In December 2016, the majority of Chambers of Agriculture were re-organised and transferred to the county-level Directorates (*Directia pentru Agricultura Judetean*) of the Ministry of Agriculture and Rural Development (MARD)

– a situation that continues to persist and which now contributes to an increasing tendency to use non-impartial sources of advice such as agro-chemical suppliers.

- The on-going under-resourcing of the public advisory service, including poor training and professional updating of advisers. The number of advisers in the public system is estimated to have fallen from 800 to 480 in recent years – equivalent to around 600 farmers per adviser if only taking account of farms over 5 ha in size and ignoring the 3.3 million less than 5 ha!

- The current under-utilisation of **M2.1** (Support to help benefit from the use of advisory services). M2.1 was launched very late (August 2017) and of the seven public procurement procedures that were launched, a total of five were cancelled. From the two procedures successfully completed, a total of 9 advisory support actions were awarded contracts in early 2019 with a value of around EUR 4.0 million (36% absorption).

- The current under-utilisation of sub-measures **M1.1** (Support for vocational training and skills acquisition actions) and **M1.2** (Support for demonstration projects/information actions) were intended to provide a) training to beneficiaries of **M10** (AECM), and; b) demonstration actions for beneficiaries of **M11** (organic farming). However, both sub-measures were launched very late and the absorption to-date of allocated funds is minimal – 4.2% for **M1.1** and no expenditure yet on **M1.2**.

For more information on the under-utilisation of **M1** and **M2** see Qures (2019).

- **Targeted advice on wild pollinators**

Despite increasing public awareness of wild pollinators there is still only minimal targeted advice is actually delivered to farmers. For example, none of the contracts awarded under **M2.1** currently focus upon issues of relevance to pollinators, although three of the procurement procedures that were cancelled aimed to deliver a total of 15 contracts for advisory support to farmers with AECM agreements.

The only evidence of targeted advice is from the Romanian Lepidopteran Society which lobbied for – and subsequently developed – the AECM grasslands management package for butterflies (*Maculinea* sp.) (**M10** package 6). In particular,

members of the society have worked to promote and provide on-going hands-on support to farmers in the managed Natura 2000 area of Dealurile Clujului Est (Eastern Cluj Hills) which is one of the regions where grasslands are eligible for payments under **M10** package 6. Experience from the 2007-2013 period indicates that NGOs working locally can significantly enhance the uptake of agri-environment measures by farmers. But the same NGOs **need to remain active** to maintain farmer participation and avoid drop-out due to non-compliance, administrative errors, misunderstandings during control visits etc.

Part 3: Available evidence regarding the impact of not adopting an extended definition of "permanent grasslands"

The impact of not adopting an extended definition of "permanent grasslands" is not an issue that has been specifically discussed or investigated in Romania.

As indicated in Part 1, butterflies are the most commonly discussed / assessed type of wild pollinator and it is widely understood that traditionally managed permanent grasslands (pastures and meadows) are the most important and widespread habitat in Romania for maintaining / conserving the greatest number of butterfly species, including many endangered and rare species (Schmitt and Rákosy, 2007). The next most important habitats for butterfly species are:

- those which are transitional between open grassland habitats and forests (especially less dense, sparser forests), and;
- rocky outcrops in the mountainous / sub-mountainous areas (important for large numbers of specific species).

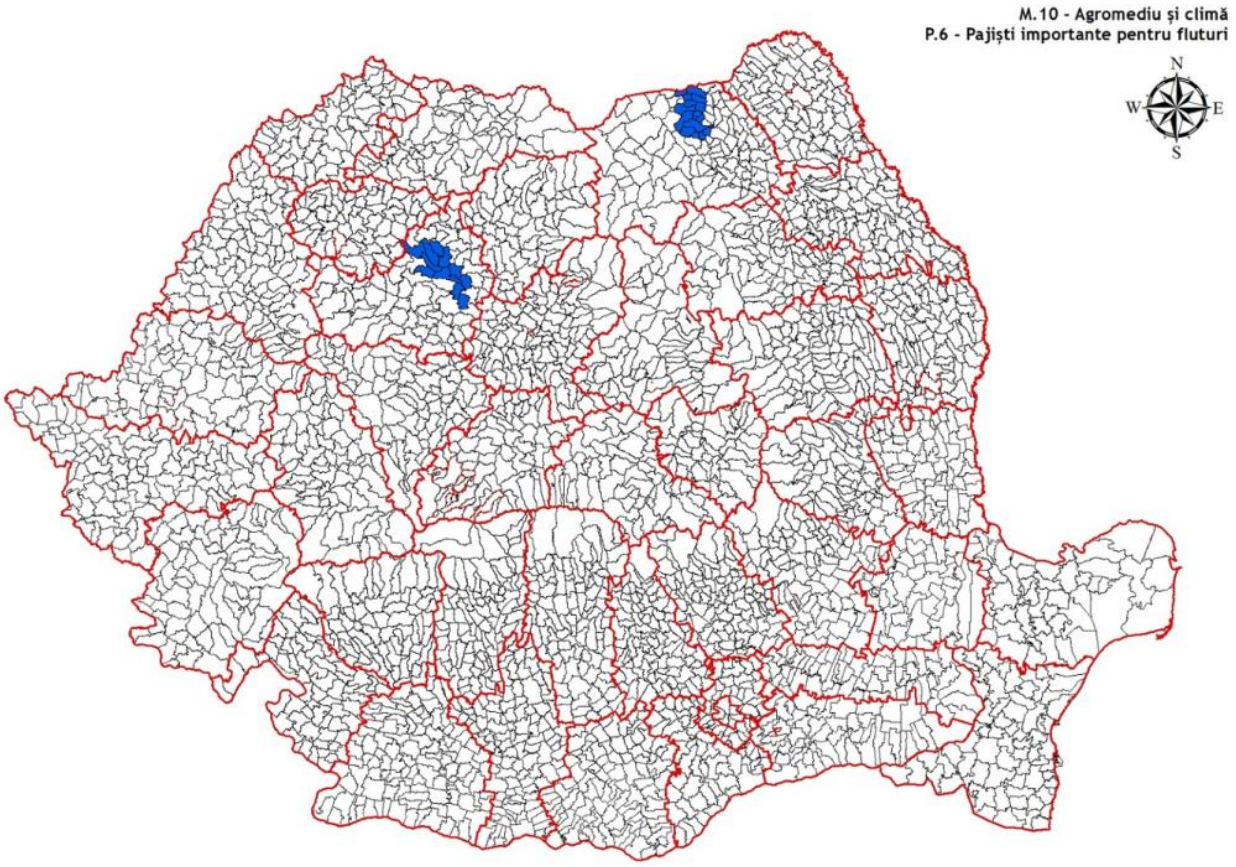
Neither of these two habitat types are relevant to an extended definition of "permanent grasslands".

Part 4: Assessment of the effectiveness of actions / schemes intended to help wild pollinators

As indicated in Table 1, the primary action to use the CAP to support wild pollinators in Romania is M10 – Package 6 - Grasslands important for butterflies (*Maculinea* sp.). This AECM sub-measure was targeted at 23,000 ha of permanent grassland in 26 designated local authority areas (UATs) in two Natura 2000 sites in northern Romania (in Cluj and Suceava counties) – see Figure below. Some 40% of the Romanian (and 3% of the European) population of the endangered

Maculinea butterfly species is found in these sites – notably the following priority species: *Maculinea nausithous*, *Maculinea teleius* and *Maculinea alcon* (Annex II) plus *Maculinea arion* (Annex IV).

The sub-measure was first developed and introduced into the NRDP 2007-2013 as Package 6 of M214 with the support of two NGOs – the Lepidopteran Society for Romania and Fundatia ADEPT – plus butterfly specialist, Laszlo Rákosy, from the Department of Ecology and Taxonomy at the "Babes-Bolyai" University in Cluj-Napoca. The sub-measure was first offered to farmers in 2012, but no monitoring data on the effectiveness of the sub-measure was collected during the remaining period of the programme and it is not mentioned at all in the Ex Post Evaluation Report of the NRDP 2007-2013 (MADR, 2017).



Source: MADR (2019)

Nonetheless, according to Dr. Laszlo Rákosy from the "Babes-Bolyai" University, Cluj-Napoca, a total of 1 200 farmers (with the active support of the Lepidopteran

Society for Romania and Fundatia ADEPT) had adopted the sub-measure by 2016 (AgroInfo, 2016) – with a total expenditure confirmed by the Paying Agency (APIA) of EUR 2.86 million during the 6 years from 2012-2017[87].

The core management requirements of **M10 - Package 6** (and previously also M214 – Package 6) are:

- Chemical fertilizers and pesticides are prohibited
- Traditional use of manure permitted up to a maximum equivalent to 40 kg N /ha
- Mowing only after 25th August
- Grazing up to a maximum of 0.7 LSU per hectare
- Any actions accelerating the natural drainage of grasslands under commitment are prohibited

The payment rate is then (in accordance with the rapidly changing nature of hay-making in Transylvania) differentiated according to the type of equipment used for hay-making:

Version 6.1 – manual mowing (scything) and hay-making. No mechanised operations, except for draught / animal powered equipment – **410 EUR/ha/year**

Version 6.2 – mowing and hay-making with light mechanised equipment of low capacity / speed. Heavy tractor-mounted / drawn equipment is prohibited – **331 EUR/ha/year**

These management requirements are broadly in line with the Species Action Plans for *Maculinea* spp. published by Butterfly Conservation Europe (http://www.bc-europe.eu/index.php?id=360) and aim particularly to avoid the risk of early and repeated mowing disrupting the life-cycle of the *Maculinea* spp. (Timuş, 2011), as well as other forms of intensification (e.g. increased grazing intensity, especially on more accessible grasslands).

The flight period of *Maculinea* spp. in Romania occurs from mid-June to mid-August and during this period the females lay their eggs on the flowers of a specific host plant (*Sanguisorba officinalis*) where the larvae remain until mid-August at the latest. Delaying mowing until 25 August ensures that this life cycle is maintained, as well as helping to maintain overall floral diversity and an abundant range of food sources for the adult butterflies.

[87] The number of beneficiaries and area of commitment were not provided by APIA despite repeated requests.

M10 – Package 6 was launched in 2015 (overlapping with **M214 – Package 6**) and had absorbed an additional EUR 1.75 million by 2017 with a total of 2 967 ha committed under Version 6.1 (manual mowing) and 1 601 ha under Version 6.2 (mechanical mowing).

The current status of monitoring of **M10 - Package 6** is unclear. It was originally intended that the population of *Maculinea* spp. would be monitored on sample plots on grasslands managed under the sub-measure, but according to biodiversity experts working with the Ministry of Agriculture a more important priority in recent years has been to set-up and run the monitoring system for the Farmland Birds Index.

Regarding the other **M10 (P1, P2, P3 and P9)** and **M11 (P6.1 and P6.2)** packages available for permanent grasslands, these clearly remain very important for all wild pollinator groups - wild bees, hoverflies, and butterflies - as well as broader biodiversity and landscape conservation. However, two issues should be noted:

The level of interest in / uptake of the grassland agri-environment sub-measures) has declined significantly in the current programme period compared to 2007-2013. According to Paying Agency (APIA) data, the total number of farmers with agri-environment commitments has fallen from 229,400 in 2011 to 68,984 in 2017. More specifically, expenditure upon the HNV grassland measure (**M214 / M10 – Package 1**) peaked in 2011 at EUR 141.62 million but had fallen to EUR 31.74 million by 2015 and only risen to EUR 68.22 million in 2017 (less than 50% of 2011 expenditure!).

According to everyone interviewed, including Ministry experts, this is due to the complexity of the new baseline (cross-compliance + greening) and associated procedures that were introduced for the 2014-2020 period (e.g. the manure storage obligations in accordance with SMR1 have been very troublesome for small-scale livestock farmers) – combined with the lack of a coherent FAS to support farmers (especially smaller-scale farmers) with compliance. Anecdotally it is reported that some local APIA offices have even reinforced this problem by discouraging farmers from applying for M10.

Numerous authors (e.g. Schmitt and Rákosy, 2007; Huband, 2008; Dahlstrom *et al.*, 2013; Kovacs-Hostyanszki *et al.*, 2016) have pointed out that all of these AECM sub-measures have to be implemented carefully because they may become detrimental if applied inflexibly, with too stringent management requirements (e.g. precise data of mowing) and too little regard for local conditions, annual variation in weather, or local customs.

For example, as Huband (2008) explains it is very difficult through a classical agri-environment scheme to replicate the benefits for biodiversity arising from the heterogeneity that is currently associated with the *"idiosyncratic management"* of farmland by the huge number of small farmers found in Romania. Idiosyncratic management that generates subtle differences in the low-intensity management practices of individual small-holders (including mowing date, applications rates of manure and timing and intensity of early/late season grazing) introduces temporal and spatial variability into the hay meadow landscape and creates variations in vegetation composition and height both between meadows and within the same meadow.

Kovacs-Hostyanszki *et al.* (2016) also highlight the importance of more *"deliberate, knowledge-based actions …to maintain traditional agricultural landscapes"* whereby *"traditional farming needs traditional farmers"* and *"the most efficient way to maintain these traditional land uses if well-being of local people can be enhanced to a level acceptable for them"*. The obvious conclusion being that biodiversity conservation – including for wild pollinators - in Romania needs to be linked much more with policies that also foster a wider approach to socio-economic development in rural areas.

Finally, in addition to the M10 (AECM measures), plus M11 (organic farming), it is likely that the **interaction of VCS payments and the "greening package" EFA rules** is creating more favourable conditions for wild pollinators on the specialist / mixed arable farms that predominate in in the lowland areas in Romania. According to Paying Agency (APIA) data the area of lucerne, soybean and peas / beans (for processing) – all of which are insect-pollinated – almost doubled in two years from 145,649 ha in 2015 to 275,387 ha in 2017. All of the lowland farmers (and agronomists) interviewed confirmed that this was due: a) to the VCS support scheme offering enhanced rates for these nitrogen-fixing crops and b) the fact that these same crops could also counted be both towards the nitrogen-fixing crops eligible for EFA and the crop diversification 'greening measures'.

Combined with the pesticide ban on nitrogen-fixing crops grown as EFA this is likely to be very beneficial for wild pollinators in the lowland areas, although this will be dependent upon good compliance by farmers with the pesticide ban. As an agronomist from the Agricultural University in Bucharest pointed out, the eligibility conditions for receiving VCS payments potentially conflict with the EFA rules. For example, regarding soybeans a farmer must provide proof of selling at least 1.3 tonnes of soybeans per ha to receive the VCS payment. This implies that the crop must be productive and clean – which is agronomically very challenging on the highly productive soils characteristic of lowland Romania (see photo of

hand-weeding an EFA-eligible soybean crop below). Indeed, the same agronomist questioned whether it is even possible and suspected that farmers may be using residual herbicides to check weed growth in the early stages of crop establishment/growth.

Manual weed control (July 2019) in a soybean crop grown for counting towards Ecological Focus Area (EFA) in Călărași County, Romania

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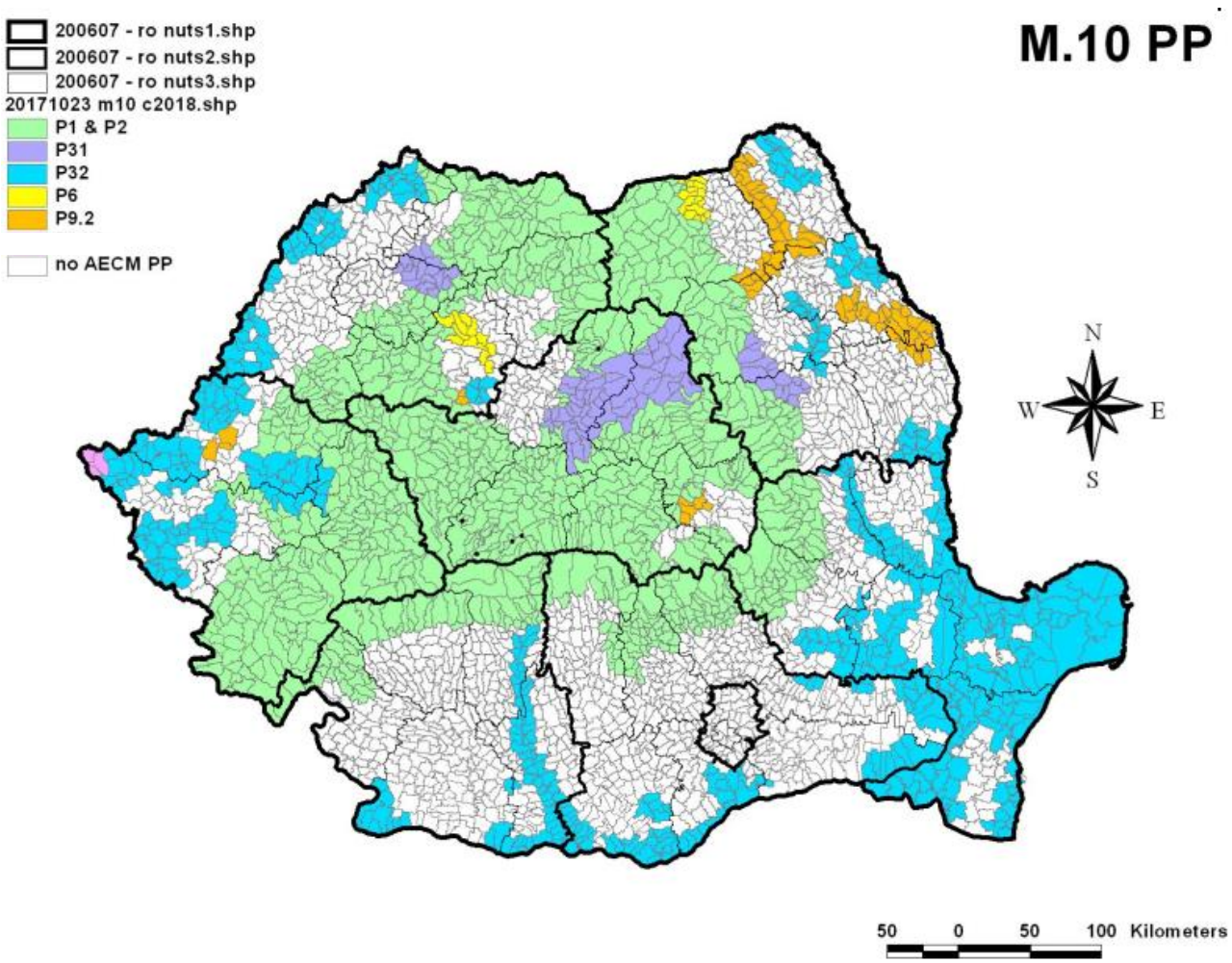
Annex 1: Distribution of permanant grasslands eligible for support under M10 – P1, P2, P3, P6 and P9 of the *NRDP 2014-2020*



Source: MADR (2019)

2.6 Spain: Andalucía

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INTRODUCTION

Spain is particularly rich in insect pollinators within the European Union; 9,500 hymenopteran species, 7,000 dipteran species, 4,000 lepidopteran species and over 10,000 coleopteran species have been identified. Among Hymenoptera, at least 1,105 wild bee species have been described to date, while in Europe there are almost 2,000 species (MITECO, 2019). This means that Spain should play a key role in pollinator conservation.

Spain covers an area of 505,991 km^2, of which 80 % is rural. Of the total area, agricultural land covers 55 % and forest land 27 %. In Spain, rural development policy in the 2014 to 2020 period was implemented through 18 separate Rural Development Programmes (RDPs), one at national level and 17 regional RDPs (autonomous communities). Although no specific measures to enhance wild pollinators are supported within the RDPs, 12 autonomous communities provide agri-environment options that support keeping honeybees in semi-natural areas, with the reasoning that this will help to maintain the floristic diversity of these habitats and thus may have indirect benefits for the wild insects.

The Western honeybee *Apis mellifera*, is a domesticated species essential to the beekeeping sector that has been the focus of research and economic invest, and which has his own action plan, co-financed by EU. This plan does not consider wild pollinators. The application of the Plan falls on the regions (as to the RDPs), which execute and supervise their application as set out in their respective implementing provisions (MAGRAMA, 2016).

Apiculture is an important activity in Spain: there exists nearly 24,000 honeybee keepers and over 2500,000 beehives, being the country with the most hives in Europe (15.7%). 80% of hives are managed by professional beekeepers; however, most people devoted to beekeeping are not professionals. On average a professional holds 399 hives, whereas a non-professional person has 28 hives (MAGRAMA, 2016).

Nearly one third of beekeepers are located in the Mediterranean region. Particularly, Andalucía, Valencia and Cataluña regions hold the 28 % of honeybee farms, 42 % of the beehives (Andalucía 22 %, Valencia 16% and Cataluña 4 %) and pro-

duce nearly the 50 % of the national honey. Andalucía is the region where economic value of pollination for agriculture is the largest in Spain (878 million €), representing the 36.5 % of the total economic value in Spain (Greenpeace, 2014). Besides, Andalucía is the region with more honey production (6363,000 kg, 20.4 %, 2015; MAGRAMA, 2016). For all those reasons, **Andalucía is the focus of the case study**.

Andalucía region covers 87,597 km^2 (around 20 % of Spain) and almost all the territory is considered as rural. Utilised agricultural area (UAA) is over 4.4 million ha of which 25 % is irrigated, producing almost 70 % of the regional farm income and generating more than 60 % of agricultural employment. Olive groves are cultivated on 25 % of the UAA and dehesa agroforestry systems other 21 %.

Part 1: How pollinator considerations played a part in Andalucía region's CAP implementation decisions

In Andalucía, measures with potential positive impact on pollinators and their habitats mainly comes from its RDP. Despite no specific measures are designed for wild pollinators, the Agri-Environment Climate Measure (AECM) **Apiculture for biodiversity conservation**, aiming at strengthening pollinator environmental services provided by *Apis mellifera*, might be a worthy opportunity to encourage pollinators. A description of the measures with potentially positive impact on pollinators is stated below.

1. **Andalucía's RDP. M1 measure: knowledge transfer and information actions**

RDP specifically considers measures that can indirectly promote pollinator through training actions such as the biodiversity conservation and restoration of natural areas, including Natura 2000 areas, Less Favoured Areas (LFA), Mountain areas, High Nature Value Systems or European landscapes (4A Focus Area), but there is no specific reference to pollinators.

2. **Andalucía's RDP. M2 measure: Advisory services, farm management and farm relief services**

This measure also considers actions that could indirectly benefit pollinators, but there is no specific mention to them.

3. **Andalucía's RDP. M4. Investment in physical assets. M.4.4. sub-measure: agri-environment climate measure (AECM) linked to non-productive investments.**

This action supports the creation and restoration of valuable landscape features aiming at increasing landscape heterogeneity and biodiversity conservation, such as wooded hedges (trees or shrubs), wood patches, isolated trees, and with special emphasis on arable lands. This action considers the reduction of pollution focus of nitrates and pesticides. It also includes restoration of different type of wetlands while sowing herbaceous species for wild fauna. These actions are also available for olive groves, where in Andalucía cover 1.52 million ha (30 % of the agrarian land). Other measure of potential interest is the support and conservation of Green Infrastructures, including livestock drove roads, since these infrastructures act as ecological corridors and reservoirs of wild bee diversity. Indeed, they are protected for their priority function of transhumant livestock herding (Hevia et al., 2016). Another measure is the restoration of dehesa agroforestry systems based on fostering oak trees recovery. Summing up, this sub-measure supports a wide array of actions of interest for pollinators, although no allusion is given to them.

4. **Andalucía's RDP. M 8 measure: Investments in forest area development and improvements of the viability of forests; M 8.2 measure: Support for establishment and maintenance of agroforestry systems**

This action includes the recovery of the tree layer in dehesa agroforestry systems, under the consideration that tree canopy plays an important ecological role in dehesa functioning.

5. **Andalucía's RDP. M10 measures: Agri-Environment Climate (AECM)**

Within this package of measures, there are different actions that may encourage pollinators, although only the *apiculture for biodiversity conservation* action is specifically designed to promote pollination services. These actions are preferentially designed for Natura 2000 areas.

   a. **Andalucía's RDP. M10.1.1 measure: apiculture for biodiversity conservation**

This measure is rooted on the basis that (i) pollination services are declining due to the decreasing trend of pollinators, negatively affecting crop production and endangered wild flora pollination, and (ii) the domestic honeybee *Apis mellifera* is the most efficient and versatile pollinator and, as such, its promotion will contribute to both crop pollination and the conservation of the wild rich flora of Andalucía region. Moreover, transhumance in Apiculture plays an essential role taking advantage of different flowering periods in both wild plants and crops.

The agri-environmental commitments of this action are:

- To keep apiaries of no more than 80 beehives with at least of 1 km length with other apiaries of the same beekeeper.
- To hold a minimum of 150 hives located in the Andalusia region.
- To keep the hives in the "host area", allowing up to 80 % of the hives to be kept for six months in agricultural lands (arable and permanent crops). Host areas are the ones with natural vegetation, which are identified by the Spanish Land Parcel Information System (LPIS) as forests (FO), wooded pastures (PA), shrubby pastures (PR) and pastures (PS).

The specific selection criteria for this action are:

- Settlement in Natura 2000 areas.
- Settlement in dehesa-like agroforestry systems
- Greater number of hives.

Payment is 19.01 €/hive and year.

b. Andalucía's RDP. M 10.1.3 measure: conservation and grassland recovery in dehesa systems

Dehesas are recognized as complex biodiversity and cultural systems based on the extensive livestock management, and where livestock feed on grass, shrub and forest layers. In Andalucía region dehesas cover more that 1 million ha. This agroforestry system is threatened, among others, by the lack tree recruitment, oak tree decay and inappropriate soil management practices due to overgrazing. Hence, this action promotes the restoration of grass cover by increasing its biodiversity (oak tree restoration is considered in M4.4). Although not considered, wild pollinators benefit from this action.

c. **Andalucía's RDP. M 10.1.4 measure: sustainable arable non-irrigated crops**

This measure was firstly implemented in 2018 and promotes the recovery of degraded soils in arable lands through different actions such as direct sowing, stubble left on the ground or the creation of multifunctional margins. These margins will be composed of at least 3 species, of 1.5 m band width and covering a 5 % of the arable land. This action is interesting for wild pollinators, although they are not mentioned in the RPD. To date only 4 farmers in Andalucía have benefited from this volunteer AECM payment. The reason has to do with the low economic reward and the requisites to be obeyed: to develop conservation agriculture and direct seedling in the arable land together with the use of at least three herbaceous species.

d. Andalucía's RDP. M 10.1.6/7/11/12 measures: sustainable permanent non-irrigated crops

This action is aimed at preventing permanent crops such as olive groves, vineyards, and almond trees including organic farming and mountain farms from soil erosion. It consists of the creation of spontaneous green cover strips of 1.8 or 3.6 m band width. This action is interesting for wild pollinators, although they are not mentioned.

e. Andalucía's RDP. M 11.1. measure: organic farming

This action promotes the conversion of conventional agriculture to organic farming, including apiculture, although the reasoning behind this action does not rest on the boost of wild pollinator.

6. Andalucía's RDP. M 16. measure: Cooperation

The European Innovation partnership (EIA) is the framework for the development of projects that bring together agrarian organisations, public institutions, and private initiatives as the one recently launched tightly linked to the M.10.1.4. action (sustainable arable non-irrigated crops). The aim of this pioneer project is the creation of multifunctional margins to prevent from soil degradation, carbon sequestration and fostering biodiversity in arable land (please see Part 4 of the present report).

7. Good Agricultural and Environmental Conditions rules (GAEC)

In Spain, the State-level GAEC7 requirements are established in RD 1078/2014. The elements covered by GAEC7 are described as:

- Hedges

- Isolated trees, trees in lines and in groups

- Field margins

- Ponds and natural livestock drinking points

- Patches of natural vegetation or rock

- Retaining terraces

- At the discretion of the regional authorities: heaps of stones, small structures such as drystone walls, dovecots, and other elements of traditional architecture that can harbour wildlife.

GAEC7 is potentially an important part of the policy package and Spanish implementation at State level includes a range of landscape features including large groups of trees and patches of natural vegetation such as shrubs. However, identifying all these elements on LPIS is a huge administrative exercise that is not complete (Beaufoy, 2015).

8. Greening: permanent grassland rules

Designation of Environmental Sensitive Permanent Grassland (ESPG) in Spain has been made by the transposition of the EU directives 92/43/EEC o 2009/147/EC under Art. 21 of RD1075/2014. According to this article, ESPG in Spain was only designated within Natura 2000. Ploughing ban of ESPG may be understood as a means of preventing the intensification of grassland management. Farmers that plough ESPG will be obliged to reconvert the land into permanent grassland. However, the main threat to these pastures is abandonment. No mention is given however to the potential loss of pollinators.

9. Greening: Ecological Focus Areas (EFA)

Spain considered as EFA the following categories: fallow lands, nitrogen-fixing crops, forested areas and agroforestry systems implemented in RDP. This choice left out elements of positive effect on biodiversity such as forest edges or landscape features (hedges, isolated trees, wood patches, field margins or traditional stone walls). Since 2018, fallow land with green cover including a seed mix with melliferous plants is considered as EFA. In addition, the use of pesticides in EFA is banned, although this ban has not been communicated as being good for pollinators.

10. Pillar 1 eligibility rules

Spain decided to extend the definition of permanent grasslands (PG) in 2018 since a relevant proportion of scrublands, wooded pastures and agroforestry systems, key ecosystems for traditional extensive livestock, were left out from the direct payments in 2014. This represented a further pressure for the already threatened extensive livestock ranching. Hence, the avoidance of being ploughed these traditionally grazed areas or convert them to arable lands was not the reason for extending the PG definition in 2018. Again, no reference was made to pollinators.

To conclude, a lack of acknowledgement of wild pollinators has been pointed up within the whole package of measures in Andalucía region (and probably in Spain), since pollinators are not even mentioned (but see AECM 10.1.1.). However, there is room to encourage wild pollinators with the above-mentioned rules. The

2nd step is to know the degree of implementation, something rather difficult to look for after 2017.

Part 2: Advice made available to land managers to help them encourage pollinators

According to the evidence retrieved from official published documents (RDP monitoring and assessment documents) and interviews, the latter including people from apiculture organisations, government of Andalucía (Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible of Andalucía), NGOs (WWF), agrarian organisations (ASAJA-Sevilla and UPA-Andalucía) and entomologist working on wild pollinations, the advice provided to beekeepers and/or land managers is (i) scarce, (ii) focused on apiculture, (iii) and through in-person courses. For example, several apiculture organizations organise the courses to professional and non-professional beekeepers of the following topics:

- Introduction to apiculture
- Introduction to honeybee pathologies (varroosis)
- Introduction to honeybee queen rearing
- Introduction to honeybee feeding

URL: http://www.mieldemalaga.com/asociacion/cursos.html

URL: http://www.cursosapicultura.com

In addition, the environmental educational program of Andalucía, performed by the IFAPA institute, organise courses co-financed by EAFRP of beekeeping within natural protected areas every year (20 hours, 20 places), and courses to become a professional in the beekeeping sector. These courses are taught by qualified beekeepers and technicians belonging to the "Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible of Andalucía" and consist of in-person courses with demonstrative activities in natural protected areas.

URL: http://www.juntadeandalucia.es/medioambiente/formacion

URL: http://www.juntadeandalucia.es/medioambiente/educacionambiental

Courses about organic apiculture are also scarce. This course combines theory and praxis, and may introduce topics related to the impact of beekeeping, the role of bees in ecosystems, etc.

URL:https://www.alhama.com/digital/comarca/resinera/8326-curso-de-iniciacion-a-la-apicultura-ecologica

URL: https://celama.uca.es/sostenibilidad1819/huertUCA/taller6

URL: https://cursosinem.net/curso-de-apicultura-tradicionalecologica-AGAN003PO-24311-en-jaen

To date, only one course (*Pollination workshop*), offered advice on how encourage pollinators. It was organised by a private organisation (Alvelal) in 2018 and financed by EAFRP funds, with 15 farmers attending. The aims of the workshop, through theoretical and practical lessons, were to introduce and instruct farmers into (i) concepts and practices of pollination in crops, (ii) different type of flowers, (iii) wild pollinators and the types of pollinator according to the agent, (iv) pollinators' microhabitats so that farmers know how to help them. This includes the building of insect hotels, the appropriate material for every pollinator, etc. The course also focused on how to manage honeybee hives, the optimal number and the spatial distribution of hives within a crop, the best moment to settle them and the advantages and shortcomings of this type of pollination.

URL:https://www.alvelal.net/single-post/2018/11/20/Aprendiendo-sobre-polinización-y-polinizadores

The IFAPA institute in Almería (La Mojonera) has also organised a few courses to encourage pollinators in intensive crops within greenhouses that depend on insect for pollination, such as tomato, avocado or aubergine.

Summing up, the advice and training conducted by private or public institutions/organizations about pollinators, co-financed or not by CAP funds, is still scarce.

Part 3. Available evidence of what the impact has been of including or excluding traditionally grazed heathlands or scrub as "permanent grassland". And investigate similarly where such habitats are supported by AECM

Unlike many EU Member States, a large proportion of permanent pastures in Spain is rich in wood cover (scrublands, wooded pastures, agroforestry systems), a feature shared with all Mediterranean countries and regions, which hardly produce herbaceous forage resources during the long summer. Here, trees and

shrubs provide additional forage for livestock, becoming the unique forage resource in summer and early autumn. Indeed, several wooded pastures are included in the EU Habitats Directive; probably the best known is the Mediterranean wood pastures with evergreen oaks (dehesas, Habitats Directive 6310), but there exist others where extensive livestock farming also depend on them: for example, the wild olive trees with thermo-Mediterranean scrub (EU Habitats Directive 9320) in Andalucía, which are usually browsed by goats, and the production outcome is a cheese of high added value; or high-altitude pastures in Sierra Nevada mountains in Andalucía as well, where a complex mosaic of pastures and shrubs provide forage for transhumant livestock during the summer (Ruiz & Beaufoy, 2015).

According to the Spanish *Land Parcel Identification Systems* of 2013 (SIGPAC), pastures covered 18.6 million ha in Spain of which 86 % corresponded to the categories of wooded pastures: pastures with trees (PA), with 5 million ha, and shrub pastures (PR) with 11 million ha; the remaining 14 % correspond to herbaceous pastures (PS). Both SIGPAC categories (PA, PR) are characterised by the abundance of tree and/or shrubby vegetation and constitute the bulk of Spanish grazed areas. As a result of the EU AGRI audit, where auditors pressured Spain to reduce the total eligibility area, Spain decided to reclassify many of those PA and PR as forests (FO). FO category is not eligible for CAP direct payments. The reclassification process was adopted by cartographic/remote sensing criteria, taking into account tree (or shrub) cover. Whether the system was being grazed or not was left aside. In addition, Spain applied a severe pro-rata system by which the remaining permanent grassland with scattered ineligible features (such as landscape features and trees) a fixed reduction coefficient was applied (*Coeficiente de Admisividad de Pastos, CAP*). Consequently, a large proportion of traditionally grazed wooded pastures were not eligible, and thousands of farmers were negatively affected by this process (Ruiz & Beaufoy, 2015).

Despite the urgent need for evaluating the impacts of the CAP eligibility rules for permanent pastures, unfortunately, there is no data on the outcome of excluding many grazed areas from CAP direct payments neither in Andalucía nor in Spain. However, the common feeling in the agrarian organisations (ASAJA, UPA), NGOs (WWF) and pastoralist experts interviewed is that the new set of rules adopted from 2014 (i) introduced further pressure on the already threatened extensive livestock sector; (ii) the "grazable" areas have continued to be grazed, despite farmers have not received CAP direct payments. Hence, the immediate abandonment of these important habitats for pollinators did not take place within this period; (iii) this change had an impact on organic livestock, since requisites to be accomplished regarding the -low- livestock stocking density for organic farming due to the reduction in the eligible area were more difficult to a be achieved.

To appreciate any trend, we should probably look backward to 2005, when CAP support for livestock farming shifted from payments per animal to payments per hectare, incentivising farmers to remove the features that make them so special, to abandon the pastures altogether, or to convert them to forestry use (Beaufoy et al., 2015). In Spain, the most extended pattern was the abandonment of wooded pastures (although intensification also took place), including habitats within the Habitats Directive. The lack of grazing promotes shrub encroachment, and probably the loss or decline of these interesting and high value systems.

With the so-called Omnibus Regulation (European Council, 2017), wooded pastures grazed by livestock may be eligible even if grass cover is not predominant or are not present in these lands. From 2018 Spain and Andalucía region had the chance to introduce several changes in the LPIS, so that the eligible area could increase, both considered forest areas (FO) as wooded pastures. According to the Official Gazette of Andalucía, from 2019 the specific characteristics of certain traditional agrosilvopastoral systems of high ecological, economic and social value -such as dehesas- will be taken into account, removing the effect produced by trees in the pro-rata coefficient calculation in those areas where trees occur and produce food for livestock (dehesa-like agroforestry systems). This means that the eligible area increases, although farmers will not receive the corresponding direct payments. That will probably happen in the post 2020 CAP. However, there exist AECMs and other RDP measures by which farmers can benefit from, but mainly linked to dehesa systems (please see M.4.4., M.8.3 and M.10.1.3 in Part 1).

Summing up, as Spain has by far the largest extent of wood pastures of any EU Member, the re-definition of permanent grassland adopted by Andalucía from 2018 has to do with the large "grazable" areas that were left out from the CAP direct payments. Nothing suggests that the reason rests on the negative impact on the already declining pollinator populations, neither to protect habitat of interest according to the EU Habitat Directive.

Part 4: The effectiveness of actions and schemes deliberately intended to help pollinators.

To date only one action to encourage pollinators and supported by CAP funds has been implement in Andalucía. It is a project called ***Management of multifunctional margins in non-irrigated crops to improve carbon's balance and biodiversity***. This project is coordinated by one agrarian organisation (ASAJA Sevilla) with the collaboration of the Andalucía's government, Syngenta and one agrarian cooperative. The framework is the European Innovation partnership considered under Measure 16 (Cooperation) of the Andalucía's RDP. The project is

closely linked to one AECM (M.10.1.4: *sustainable arable non-irrigated crops*) offered from 2018. Only four farmers have benefited from this AECM measure in the first call. The novelty of the measure, and the concomitant lack of knowledge base of how developing a multifunctional margin, the species to be sown, etc., together with the low economic support (98 €/ha) discouraged farmer to get involved in this measure.

Regarding this pioneer project in Spain, the aim is to optimise the establishment and management of multifunctional margins in non-irrigated arable crops, with special emphasis in Natura 2000 areas. The project lasts two years (2018-2020) and two agrarian campaigns and it is being conducted in four farms in Andalucía. The selected farms are representative of the type of arable crops in the region.

The experimental design is as follows: in each farm four margins has been stablished in December 2018. Each margin consists of a set of herbaceous plants:

(1) Species included in the M.10.1.4 (list of eligible species included in the M.10.1.4 annex)

(2) Species considered in land laying melliferous fallow (fallow EFA) according to the National and regional legislation.

(3) and (4) a mixing of different species proposed by the operative group, including several species of the M.10.1.4.

Margins are of 100 m length and 3-4 m width. Within each margin several pitfall traps were set and hand net sampling for flying insects has been conducted. Soil samples have been taken for carbon sequestration studies. Although samples have not been analysed yet, entomologists' opinion is that, at least for flying insects, it seems that these margins increase their abundance and richness.

Despite the initiative seems to be promising for pollinators, farmers' acceptance is variable and in some cases negative for the following reasons: additional work in their farms, low aids or the extended idea that these margins represent a focus of weeds in their fields that compete with their crops and decrease crop production.

URL: https://www.asajasevilla.es/asaja-sevilla/proyectos/grupos-operativos/gestion-de-margenes-multifuncionales.html

There exists other interesting initiative to foster wild pollinators (***Operación Polinizador***). It is a European private program financed by Syngenta with several case studies in Spain (in Andalucía as well) aiming at preserving and increasing biodiversity in agrarian systems, by encouraging wild pollinators. For 10 year ago,

this project promotes the establishment of experimental multifunctional margins in arable and permanent crops, investigating their effects on pollinator abundance and biodiversity. Although the information available about the outcomes is not abundant, entomologists interviewed highlight the spectacular outcomes enhancing wild pollinator populations.

URL: https://www.syngenta.es/agricultura-responsable/operacion-polinizador

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ANNEX. INFORMATION FROM ADDITIONAL REQUIREMENTS

How many beneficiaries have there been since 2014 or in one year e.g. 2017, and how many hives these had – and also if possible what proportion of these hives actually stayed all year in the "host areas" (Natura 2000 or dehesa)?

According to the 2017 RDP monitoring report of Andalucía, about 1.120 farms with 378,456 beehives have subscribed the AEM 10.1.1. commitment of which 386 farms were located in Natura areas. Regarding organic farming beehives, 16,161 beehives belonging to 4,465 farms are certificated as organic farming production, while 4,724 new beehives have acquired the commitment to obtain the organic production certificate, and to maintain it for a period of 5 years.

How many beekeepers attended the courses of the IFAPA institute since 2014 or in 2017 and what proportion of these were benefiting from the agri-environment option?

According to the 2017 RDP monitoring report of Andalucía, the IFAPA institute organized four face-to-face courses of Apiculture and Heliciculture (both appear together) totaling 120 hours taught, and with 64 attendants, being 24 adult men, 18 adult women and 22 young.

What is the motivation of the 15 farmers attending the one Alvelal course and is getting more farmers on these courses should be a recommendation we could make for the future, as it looks like this is completely independent of the M10.1.1. meaure?

According to the information provided by the Lecturer of the course:

This was its first edition (2018), and it will probably be taught this year again.

The attendance was low (15) for several linked reasons: (i) nowadays there is a clear disconnection between farmers and nature, agriculture is a complementary income, (ii) most farmers consider all 'bugs' as potential pest, so the idea of fostering wild bees and other insects could become a threat for their farms.

Nevertheless, attendants changed their point of view at the end of the course.

It would be very useful to incorporate this course to the already ones taught in the IFAPA institute within the knowledge transfer and information actions of M1 measure, but administrative issues together with the still poorly recognized wild pollinators by administration makes it difficult.

Also please either confirm that the beneficiaries of the M10.1.1. measure do not have to attend any training course, have any beekeeper certification or receive any advice, or alternatively if they do, then what are the exact requirements.

There is no requisite related to the attendance at any training course, and beekeepers do not receive any advice.

It would be very helpful to have some opinions of managers of the Natura 2000 sites on whether they think the beehives are helpful for nature conservation on the site or not, and whether they are thought to improve or damage the prospects of wild pollinators.

A common view among nature technicians is that it is a topic on which there is not yet a background of knowledge that helps them to incorporate detailed criteria on their work.

Nature technicians think that this issue should try to be focused on their complementarity (domestic bees versus wild bees), but, at the same time, being aware to the scientific research conducted focusing on other effects (e.g. interspecific competition). In this sense, the Government of Andalucía recognizes the role of domestic bees as pollinators, a statement that is part of the consolidated knowledge to date (according to their view)

According to their opinion, this debate is beginning and, as in other areas that have not been fully explored, it is needed quality information in order to be able to judge the matter with more data and criteria as knowledge grows up.

It would also be interesting to know more about the M 10.1.4 measure - 4 farmers in a pilot project financed through the cooperation measure seems like a very small impact in relation to the effort of establishing a new scheme and setting up the project in the first place – so what were the original intentions? Was the uptake expected to be much higher and if yes why was this not the case?

Andalucía region has convened the M 10.1.4 measure for the first time in 2018, which includes a specific commitment related to the implementation of multi-functional margins. Although the acceptance in the sector of this AECM has been very limited in this first call, cooperation is essential to expand the base knowledge available to farmers and Administration, since a good selection of plant species and a management adapted to the conditions of the Mediterranean climate, are key elements to guarantee the success of this measure.

Farmers received an aid about 100 €/ha with the M 10.1.4 measure. By participating in the project of the operational group (M16), farmers receive a small compensation for the inconvenience of taking part in the project (in no way related to the costs of implementation of the margins).

According to the information provided by the head of Agriculture and Livestock government of Andalucía this measure was aiming at improving soil properties (through direct seedling) and foster biodiversity (by means of multifunctional margins). And of course it was expected to be much higher uptake of this measure. The reason of the low uptake is still unknown, but it will be analyzed in the near future.

It would also be interesting to know anything about the uptake of the EFA option for green cover sown with a seed mix of melliferous plants. Is any information available on why Spain chose to offer this EFA option?

According to the information provided by the head of Agriculture and Livestock government of Andalucía the uptake in the first call (2018) has been very low. This measure is of national responsibility, and its intention was to promote biodiversity linked to pollinators.

It would be interesting to know if scientists are still researching the issue of competition between honeybees and wild bees in natural habitats and what they think about the agri-env support for beekeepers – i.e. do they think there is really a potential problem there that needs to be investigated or do they think that the densities of the beehives are low enough that there is no problem. And if they think there is a problem, then how do they think it should be tackled – i.e. what guidance or rules or other measures do they recommend should be developed?

According to both scientific literature and the opinion of several entomologist specialists on wild bees which have taken part of research projects, there exists a general agreement that increasing *Apis mellifera* (but also *Bombus* spp) by promoting bee hives without any control could become a further problem (caused by its high densities) for wild bee populations due to (i) transmission of pathogens from *A. mellifera* and *Bombus* spp to wild bee species, (ii) competition for trophic

resources, (iii) interference competition and (iv) genetic introgression mainly from *A. mellifera*.

The results of a recently published paper by Valido et al. (2019), conducted in Canary Islands (Spain), which assessed the effects of beekeeping on wild pollinators, are worrisome: "[…] *beekeeping reduces the diversity of wild pollinators and interaction links in the pollination networks. It disrupts their hierarchical structural organization causing the loss of interactions by generalist species, and also impairs pollination services by wild pollinators through reducing the reproductive success of those plant species highly visited by honeybees. High-density beekeeping in natural areas appears to have lasting, more serious negative impacts on biodiversity than was previously assumed*".

On the contrary, technical staff (from the government) however still consider that beehives contribute to pollination but do not feel that honey bee compete with wild bees, or at least they need more scientific evidence (see comments above). The body of knowledge generated by scientific community does not reach the technical staff quickly, that in turn takes part in the decision process. More knowledge transfer from scientific community to technical staff and other relevant stake holders is highly recommended.

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