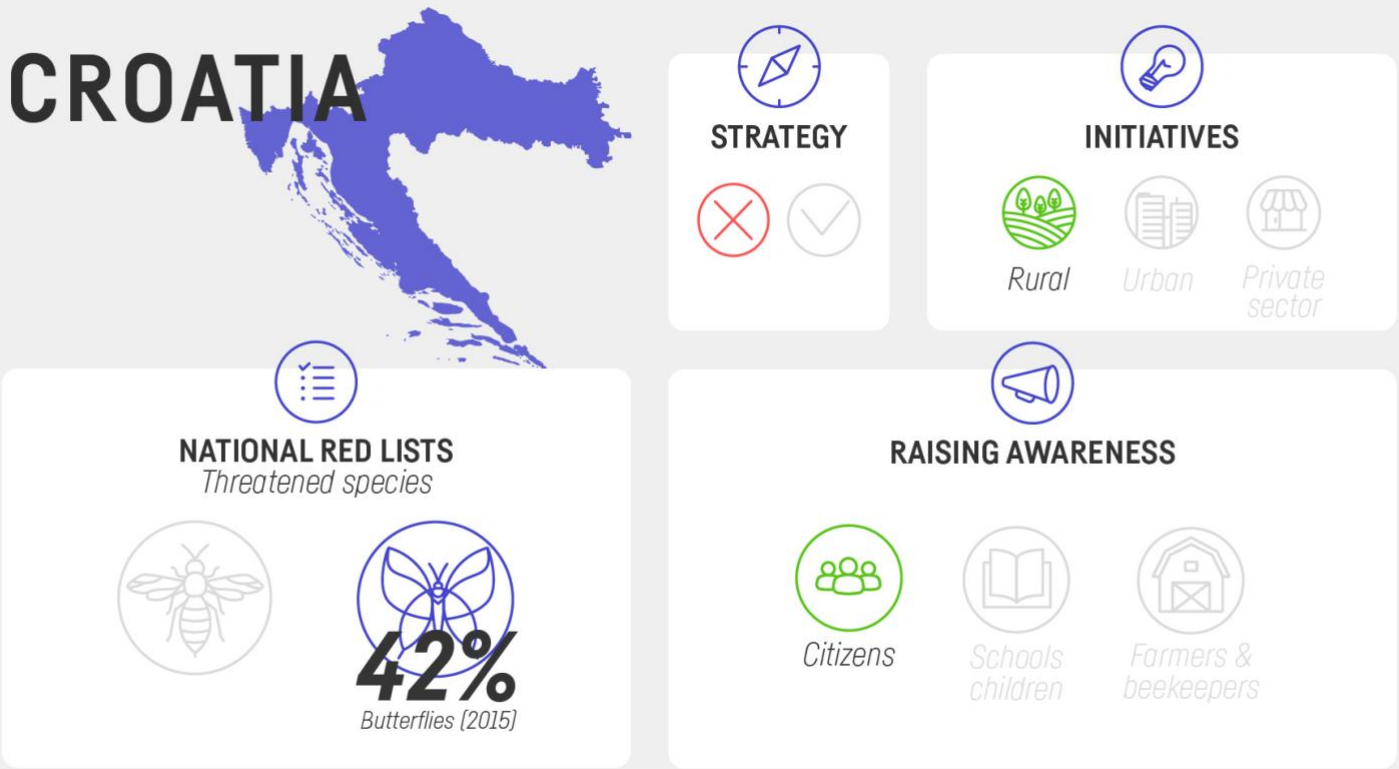
EU POLLINATORS INITIATIVE

A review of Member States actions to tackle the decline of wild pollinators



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Croatia does not have a national strategy for wild pollinators; and no strategy is in preparation at the moment.

Croatia has approx. 200 butterfly species. The Red List of Butterflies of Croatia published in 2013 assessed 45 species, of which 18% are considered to be vulnerable or threatened according to the IUCN criteria. Currently, apart from a few local long-term butterfly surveys, there is no systematic monitoring of wild pollinators. The national monitoring system for butterflies is currently being developed and will be implemented in 2019. No monitoring of other taxonomic groups of wild pollinators besides butterflies is currently planned.

There are plans that citizen science campaigns will supplement the systematic data collection from the butterfly monitoring. There are several taxonomic experts in Croatia, but only on butterflies. No training opportunities for taxonomical identification of wild pollinators are available currently.

Farmers who receive support for organic farming and/or agri-environment schemes attend compulsory training, which includes information about wild pollinators, especially solitary bees. The Croatian farm advisory service also disseminates information on wild pollinators online and in publications, media, events, and workshops, to farmers, beekeepers, schools, universities, and the public.

Several small-scale campaigns aim to raise awareness of wild pollinators conservation in the general public, organized by scientific institutions (e.g. Croatian Natural History Museum), public institutions for management of nature protected values and civil society organizations.

STRATEGIES FOR WILD POLLINATORS OR ANY OTHER SIMILAR PLANS

Croatia does not have a national strategy for wild pollinators; and no strategy is in preparation at the time of writing.

IMPROVING KNOWLEDGE OF POLLINATOR DECLINE, ITS CAUSES AND CONSEQUENCES

RED LISTS ON POLLINATORS AND DATA ON POLLINATOR POPULATIONS

The Red Book of Butterflies of Croatia (Šašić et al, 2015) lists approx. 200 butterfly species as present in Croatia. The Red List (Šašić et al, 2013) assesses the threat category and estimated distribution for 45 species. Overall, 42% of the assessed species are threatened according to the IUCN criteria (vulnerable 15%, endangered 9%, critically endangered 18%). The Ministry of Environment and Energy of Croatia states that better data on the distribution and population size of several butterfly species will be available soon.

There is little published information on wild bees (Apidae) or hoverflies (Syrphidae) in Croatia and no red list assessment of these groups has been done.

POLLINATOR MONITORING SCHEMES

Currently, apart from a few local long-term butterfly surveys, there is no systematic monitoring of wild pollinators. A national monitoring system for butterflies is currently being developed, both to comply with the monitoring requirements of the EU Habitats Directive and to monitor the effectiveness of agri-environment measures in the Rural Development Programme of Croatia. The monitoring system will be implemented in 2020 and will cover the entire state territory, according to the Ministry of Environment and Energy of Croatia. The monitoring method will be based on the one established by

Butterfly Conservation Europe, with additional monitoring programmes for specialized species. Citizen science campaigns will supplement the systematic data collection from the monitoring programmes.

No monitoring of other taxonomic groups of wild pollinators besides butterflies is currently planned. The Natura2000 Integration Project suggested using results of monitoring of bumblebees as an impact indicator for agri-environment measures, and if this indicator were to be officially accepted as an impact indicator in the next CAP period from 2022, bumblebee monitoring could be funded through the CAP technical assistance measure.

RESEARCH INITIATIVES

Currently there are no national plans or initiatives funding research on wild bees or other pollinators in Croatia.

TAXONOMICAL EXPERTS ON POLLINATORS

There are several taxonomic experts on butterflies in Croatia; however, this is not the situation for other taxonomic groups of wild pollinators. There are research groups for apiculture, mostly dealing with physiology and ethology of honeybees, within the Veterinary Faculty in Zagreb, Faculty of Agriculture in Zagreb and Faculty of Agrobiotechnical Sciences in Osijek. The Varaždin Muzeum has a notable collection of solitary bee specimens collected by the entomologist Franjo Koščec.

Currently, there are no training opportunities for taxonomical identification of wild pollinators. However, the need for taxonomical experts of this profile has been identified by the Ministry of Environment and Energy of Croatia as there are plans to encourage the increase of this expertise within the scientific institutions.

INITIATIVES TACKLING THE CAUSES OF POLLINATOR DECLINE

ACTION PLANS ON SPECIES AND HABITATS

There are no action plans on any species or habitat that support the conservation of pollinators. However, management plans for two butterfly species protected by the EU Habitats Directive (*Phengaris nausithous*, *Phengaris teleius*) are being developed. Conservation measures for these

species are targeted to the preservation and restoration of extensive agriculture, including the conservation of grassland habitats which support other pollinators.

FARMER AND LANDSCAPE INITIATIVES, AS WELL AS LOCAL LEVEL STRATEGIES

The agri-environment programme of the Rural Development Program of the Republic of Croatia for the period 2014-2020 (RDP) includes the following schemes which could benefit pollinators:

- scheme to maintain high nature value grasslands.
- scheme to support the establishment of flower strips, whose primary function is to provide habitat for pollinators and to provide pollen and nectar during spring and summer.
- preservation of hedges which contributes to the preservation and enhancement of pollinators in agricultural landscapes since during flowering, hedges provide nectar and pollen for insects.
- scheme for maintaining extensive orchards including a requirement that the beneficiary must establish at least one nesting house for solitary bees per hectare.

There is also a pilot scheme targeted at permanent grassland registered as habitat of four butterfly species protected by the EU Habitats Directive: Scarce Large Blue (*Phengaris teleius*), Dusky Large Blue (*Phengaris nausithous*), Alcon Blue (*Phengaris alcon alcon*) and False Ringlet (*Coenonympha oedippus*).

These schemes are still quite new for Croatian farmers, and uptake of the pollinator-relevant options is still very low, particularly amongst arable farmers (Alliance Environnement, 2019). In 2018, the area under agri-environment contracts accounted for just 1.25 % of Natura 2000 farmland area and 2% of the registered grassland area. In 2018, there were no arable farmers carrying out the scheme for establishment of flowering strips for pollinators.

RDP support for organic farming has a higher uptake, and the area of organic farming increased by two thirds between 2014 and 2018 (Alliance Environnement, 2019).

All farmers taking part in the agri-environment programme or organic farming support must enrol in compulsory training provided by the public Farm Advisory Service (Alliance Environnement, 2019). Due to the initiative of Ms Marija Ševar, a long-term head of the organic farming advice department and a dedicated expert on pollinators, Croatia's farm advisory service has offered organic farmers information on promoting and encouraging wild pollinators since 2002 (Todorović & Znaor, 2019). This information is also provided to agri-environment beneficiaries, especially those inscribed in the operations on (i) establishment of field strips, (ii) maintaining extensive orchards and (iii) maintaining extensive olive groves. See below for further information.

The RDP also offers support for non-productive investments for the restoration of habitats, particularly grasslands, and landscape features, including hedges, as well as restoration of ponds, ensuring the preservation of various pollinators and their habitats, linked to the agri-environment schemes.

MEASURES ON PESTICIDES

The Ordinance on establishment of a framework for action to achieve the sustainable use of pesticides (2012) defines the legal rules pesticide users must follow to reduce risks to bees from pesticide applications and pesticide-treated seeds.

The National Action Plan (NAP) to achieve the sustainable use of pesticides for the period 2013 – 2023 has defined seven measures for the protection of non-target arthropods and bees:

> Measure 1: Through the programme to educate professional pesticide users, particularly agricultural producers using PPPs to protect crops from harmful organisms, there should be systematic awareness raising on the potential dangers of plant protection products to bees and non-target arthropods.
>
> Measure 2: Stimulate cooperation between professional users of pesticides, especially agricultural producers, beekeeping societies, and other institutions included in the registration and placing on the market of PPPs, so as to reduce the risks to bees and other pollinators.
>
> Measure 3: Increase controls of implementation of prescribed risk mitigation measures for bees and other non-target arthropods during application of PPPs and sowing of treated seeds. Introduce inspection controls of the application of PPPs in the field, with the aim of controlling the implementation of risk mitigation measures for bees and other important usage restrictions stipulated for individual PPPs, for the purpose of protecting non-target organisms and the environment.
>
> Measure 4: Establish a system to monitor the exposure of bees to pesticides in real conditions of use in Croatia, in order to research the adverse impacts of pesticides on bees and the overall bee colony.
>
> Measure 5: Conduct revisions of existing procedures in the case of incidents, massive bee poisoning caused by accidental or intentional activities, and where necessary to adopt new protocols for action upon suspicion of bee poisoning with pesticides.
>
> Measure 6: Establish pollination strips to ensure a habitat in which useful pollination insects can live and feed.
>
> Measure 7: Strictly abide by the rules of good agricultural practice and good beekeeping practice and the use of PPPs in accordance with the instructions on the label of the individual PPP to reduce the risk to bees.

The Croatian agri-environment programme funds schemes to install pheromone, visual and feeding traps and to use pest confusion techniques in permanent crops, partly aimed at reducing negative impacts on wild pollinators. The use of pesticides is banned in the agri-environment measures designed to preserve high nature value grasslands, protect corncrake (*Crex Crex*) breeding meadows and protect grassland butterflies. These measures all support the maintenance of flower-rich permanent grasslands that provide good pollinator habitat.

RAISING AWARENESS, ENGAGING SOCIETY-AT-LARGE AND PROMOTING COLLABORATION

TRAINING AND AWARENESS RAISING CAMPAIGNS

Farmers taking part in the agri-environment programme or organic farming support must enrol in compulsory training and/or demonstration programmes provided by the public Farm Advisory Service, attending six hours of training or demonstration programmes each year of the course of 5 years. Organic farmers and agri-environment contract holders are given information on promoting and encouraging wild pollinators, notably solitary bees, and between 2016 and 2019 over 4,440 farmers have taken part (Todorović & Znaor 2019). All training materials are standardised and provided by the core team led by Ms Marija Ševar, who has provided advice on solitary bees since 2002 (e.g. Ševar, 2005).

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 lapidarius*, *Bombus lucorum*), the lacewing (*Chrysoperla carnea*), hoverflies (*Episyrphus balteatus* and *Eupeodes* sp.) and other wild pollinators. This information is also provided to agri-environment beneficiaries, especially those inscribed in the operations on (i) establishment of field strips, (ii) maintaining extensive orchards and (iii) maintaining extensive olive groves. Demonstration programmes on practices to preserve biodiversity are also planned, but up to the end of 2018 there were not yet any programmes (Alliance Environnement 2019).

The farm advisory service also provides advice on wild pollinators to other farmers and to beekeepers, through their own website and publications and in the media (TV and radio), farming magazines, farming events, lectures and workshops (Todorović & Znaor, 2019). The installation of solitary bee nesting shelters has become quite popular with farmers with orchards, especially pear orchards where farmers report significant yield increases.

Scientific institutions (e.g. Croatian Natural History Museum) and civil society organizations (e.g. Association BIOM) have organised several small scale campaigns to raise awareness of the general public on wild pollinators conservation.

Protected area management authorities raise awareness about pollinators. For example, through the publication of a guide to the butterflies of the region of Grad Pozega (Letić, 2013), butterflies of Samobor, and events in Varaždin county. The National Park Risnjak and Nature Park Kozjanski have organised solitary bee conservation activities in collaboration with the Croatian farm advisory service.

EDUCATIONAL CAMPAIGNS AND MATERIALS ON WILD POLLINATORS

The Croatian farm advisory service organises activities promoting wild pollinators with university students, primary and secondary school pupils and even kindergarten children (Todorović & Znaor 2019). For example, with biology teachers of primary and secondary schools in Primorje-Gorski Kotar County, and Bedekovčina Secondary School.

The University of Zagreb Faculty of Veterinary Medicine introduced a compulsory study subject on wild pollinators. Ms Ševar of the Croatian farm advisory service delivers a presentation on wild pollinators to the students of the University of Zagreb Faculty of Agriculture annually (Todorović & Znaor 2019).

CITIZEN ENGAGEMENT CAMPAIGNS

None identified.

PRIVATE SECTOR INITIATIVES FOR WILD POLLINATORS

None identified.

APICULTURE SECTOR INITIATIVES FOR WILD POLLINATORS

The Croatian Bees Society, Association of Pula Beekeepers, and Associations of Ogulin Beekeepers have cooperated with the Croatian Farm Advisory Service to deliver a range of training and advice activities on solitary bee conservation to beekeepers. Except for a few professional beekeepers, most of them are small-scale backyard garden beekeepers, not involved in farming. The trainings are quite popular and have been attended by 5,200 participants. Most beekeepers in Croatia have now installed shelters for solitary bees next to their (stationary) beehives. The Croatian Farm Advisory Service is quite proud of this achievement because in the beginning most beekeepers considered solitary bees to be foes and competitors to honeybees (Todorović & Znaor, 2019).

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Educational materials

Croatian Farm Advisory Service: Information on wild pollinators is available in various sections and archive on the website at www.savjetodavna.hr