EU POLLINATORS INITIATIVE

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

This document shall be cited as:

IEEP. 2019. Member States initiatives to support wild pollinators populations: Austria. Prepared by IEEP for the European Commission.

Date of completion: 01/12/2019

Acknowledgements: Johann Neumayer, Naturbeobachtung.at, Naturschutzbund, Dr. Bärbel Pachinger, Universität für Bodenkultur Institut für Integrative Naturschutzforschung, Vienna, Gabriele Obermayr & Elisabeth Süßenbacher, BMLFUW, Vienna, Mag. Dr. Kathrin Pascher, University of Natural Resources and Life Sciences, Department of Integrative Biology and Biodiversity Research, Institute of Zoology, Vienna, Timo Kopf, wild bee expert, Völs/Altach, Vorarlberg, Mag. Christiane Machold, Abteilung Umwelt- und Klimaschutz (IVe), Amt der Vorarlberger Landesregierung Vorarlberg, Johanna Huber, Suske Consulting

CONTENTS

No national or regional pollinator strategies are available. Austria's approach to pollinator conservation centres on conserving natural and semi-natural habitats in the Austrian protected area network and grassland and cropland habitats maintained by the Common Agricultural Policy agri-environment programme and greening.

There are no national red lists for bees (Hymenoptera) or hoverflies (Syrphidae). 27% of butterfly species and 25% of moth species are threatened, whilst 40 species are regionally extinct, according to red lists from 2005 (butterflies) and 2007 (moths). Data on bumblebee species occurrences are available, but local and regional data on solitary bees have never been compiled at the national level.

The Austrian rural development programme funds an agri-environment option for the obligatory creation of biodiversity areas for pollinators and other biodiversity on at least 5% of the farm area, as well as grassland conservation options. Farmers in the scheme had created over 70,000 ha of flowering fallows or crops for pollinators by 2016.

Initiatives for wild pollinators are mobilising citizens, local authorities, farmers and other land managers and gardeners, schools, to create pollinator habitats in both urban and rural areas, road verges and protected areas. Private sector initiatives include supermarkets, a machinery business, and the national railway network.

STRATEGIES FOR WILD POLLINATORS OR ANY OTHER SIMILAR PLANS

No national or regional pollinator strategies are available. The Austrian Biodiversity Strategy 2020+ does not set any targets for wild pollinators[1].

Austria's current approach to pollinator conservation centres on conserving natural and semi-natural habitats in the Austrian protected area network and grassland and cropland habitats maintained by the Common Agricultural Policy agri-environment programme and greening measure (see below for more details). The Ministry of Land, Forestry and Environment (BMLFUW) is responsible for the Austrian Biodiversity Strategy 2020+, the state forest area, and the rural development funding programme at the national level. The federal states have responsibility for nature conservation policy implementation, and the nature protection laws of the federal states protect and promote the maintenance of species rich agricultural areas and set up specific management requirements to achieve nature conservation aims.

Numerous NGO and local authority–run projects raise awareness of the value of wild pollinators and promote the creation of more flowering areas in urban and rural regions. The NGO Naturschutzbund has recently published a proposal for a national pollinator strategy.

IMPROVING KNOWLEDGE OF POLLINATOR DECLINE, ITS CAUSES AND CONSEQUENCES

RED LISTS ON POLLINATORS AND DATA ON POLLINATOR POPULATIONS

Hymenoptera and Syrphidae: no national red list is available for these groups. Austria has 690 wild bee species - a checklist of wild bees in Austria was compiled by Fritz Gusenleitner, Max Schwarz, and Karl Mazzucco, and published in 2012 (Schuster 2012). Data on bumblebee occurrence and distribution are available on the citizen science platform Naturbeobachtung.at (Neumayer, personal communication).

[1] It sets a national target of increasing the number of honeybee colonies to 400,000 by 2020

As nature conservation is a responsibility of the federal states, most of the information on biodiversity is only available at this level. There is one regional red list of bees:

- A red list of the wild bees (Apidae) of **Kärnten** (region located in the south of Austria) was published in 1999 (Ebmer 1999). It classifies 25% of the 413 described species as endangered (and 130 species as data deficient).

Lepidoptera: The national red list of butterflies was published in 2005 (Höttinger & Pennerstorfer (2005) and the red list of moths in 2007 (UBA 2018). The lists identified that:

- Nearly half of the butterflies are at risk, including 27% of the species considered as threatened - 15% of the 215 assessed butterfly species are endangered or critically endangered, 12% are vulnerable and 22% are near-threatened (5 species are regionally extinct);
- 18% of the 800 assessed moth species are endangered or critically endangered, 7% are vulnerable and 12% are near threatened (35 species are regionally extinct).

A checklist of butterflies in Austria was published in 2013 (Huemer 2013), and butterfly DNA barcoding information in 2017 (Huemer & Wiesmair 2017). The Tiroler Landesmuseen maintain a database of butterfly records for Austria (Huemer, personal communication).

POLLINATOR MONITORING SCHEMES

The BINATS 2 research project surveyed biodiversity in the agricultural landscape (habitat features, vascular plants, grasshoppers, butterflies, wild bees) in 2018 and 2019. The project has identified all wild bees on 100 sample sites in the main maize and oilseed rape growing regions of Austria. There was an additional triple survey of 30 hot spots in the 100 BINATS test areas during the summer of 2018.

The Austrian state forest management agencies (Österreichische Bundesforste ÖBf), which manage a tenth of the total forest area, in collaboration with the NGO Naturschutzbund, carried out identifications of the wild bee fauna at 19 sampling sites in 7 forest areas from 2016 to 2018, and now have distribution maps of 162 species in these forests (Martina Schwantzer personal communication). See section on landscape initiatives for more information.

The citizen science platform Naturbeobachtung.at provides a bumblebee identification service and collects bumblebee species reports from citizens. Observers submit geo-referenced occurrence records and photos which are validated by experts, which makes the data useful for monitoring (Neumayer personal communication). The platform is also collecting butterfly records (Schmetterlings-app). See further information in the citizen engagement initiatives section.

RESEARCH INITIATIVES

A number of Austrian universities are carrying out research into land use/ land management and its impact on wild pollinators, for example:

- The BINATS 2 research project is using the wild bee monitoring results to assess the effectiveness of selected agri-environment measures on wild bee diversity;
- The ILEN (Healthy Alps) project researched the impacts of land use change in the alps on pollinators – one finding was that hoverfly abundance was significantly higher in managed than abandoned meadows, but that both managed and abandoned meadows provide important habitats types for hoverflies which will be lost if meadows are left to completely convert to woodland (Hussain et al 2017);
- BOKU (University of Natural Resources and Life Sciences) in Vienna researched the impact of grassland re-establishment on wild pollinators;
- The University of Salzburg is researching plant-pollinator functional responses to altitude and climate change.

A research project (2009-2012) investigated the occurrence of bee losses in Austrian maize and rapeseed cropping areas and tested possible connections with honeybee diseases and the use of plant protection products (acronym: MELISSA). From 2011 to 2013 (i.e. before the EU ban was introduced), a monitoring programme measured exposure of honeybees in field conditions to the neonicotinoids clothianidin, thiamethoxam, and imidacloprid, and also fipronil (CIFT-HOBIENEXPO and Bienexpo 13) (AGES, 2012; AGES, 2013).

TAXONOMICAL EXPERTS ON POLLINATORS

A number of experts have carried out local and regional studies on the wild bee fauna (e.g. Ockermüller & Zettel, 2016), but they have not yet been compiled at the national level.

INITIATIVES TACKLING THE CAUSES OF POLLINATOR DECLINE

ACTION PLANS ON SPECIES AND HABITATS

There are no national action plans for endangered pollinator species or habitats as the federal states have responsibility for nature conservation policy implementation.

FARMER AND LANDSCAPE INITIATIVES, AS WELL AS LOCAL LEVEL STRATEGIES

Common Agricultural Policy Rural Development Programme

The **Austrian rural development programme** (ÖPUL) agri-environment-climate programme contains the whole-farm agri-environmental measure „Environmentally sound and biodiversity-promoting management“ (Umweltgerechte und Biodiversitätsfördernde Bewirtschaftung von Acker und Grünland UBB). This measure funds the obligatory creation of biodiversity areas for pollinators and other biodiversity on at least 5% of the farm area. These areas are either: sown with seed mixtures of at least 4 insect-pollinated plant species and kept for at least 1.5 years with no fertiliser or pesticide use and mown annually; and/ or with flowering crops on arable land and/or with grassland. Farmers in the scheme had created nearly 70,000 ha of flowering fallows offering food and habitat for pollinators, 3000 ha of flowering crops such as legumes and medicinal /aromatic plants, and around 3300 ha under crop rotation with at least 5 flowering crops (an option developed with beekeepers) by the end of 2016 (BMLFUW personal communication). Farmers can use their UBB area to comply with the greening measure. Also, many farmers are using the crop rotation with at least 5 flowering crops to comply with greening.

Other RDP measures also provide benefits for pollinators. The agri-environment-climate scheme for nature conservation funded extensive or near-natural management of a total of 72,000 ha of grassland in 2016 (BMLFUW personal communication). The rural development (ÖPUL) measures „Organic farming“ and „Environmentally sound and biodiversity-promoting management“ ensure the maintenance of permanent grasslands and landscape elements (hedges, single trees, tree lines, banks and other field margins) on a total of 1.6 m hectares (status 2016). These measures aim to protect the small-structured Austrian landscape characterized by alternating woodland, grassland, orchard meadows, arable land and its high share of landscape elements.

The funding allocated to RDP measure 7.6 (rural and cultural heritage) is used for competitive calls for biodiversity projects, and in 2019 the call was specifically for insect projects (habitat creation, awareness raising, training etc).

All farmers in the UBB scheme must attend training on environmental priorities including biodiversity. Farmers in Austria can also access advice and training provided by a range of different organisations who can apply for competitive funding calls to offer training on particular issues. However, there is still a need to raise farmers' awareness of the environmental benefits of actions – especially about flower strips, which many farmers still think look messy[2].

State forests

The Austrian state forest management agencies (Österreichische Bundesforste ÖBf), which manage a tenth of the total forest area of Austria, launched the initiative 'Aktiv für Wildbienen' (active for wild

[2] Johanna Huber, Suske Consulting, personal communication

bees) in 2016 in collaboration with the NGO Naturschutzbund. The initiative was a response to a national study that highlighted the situation of wild bees in Austrian forests (Schwarzl & Sedy 2015). The project team has developed management plans and practical advice on how to promote wild bees in different forest habitats and landscapes (Martina Schwantzer personal communication and ÖBf 2017). They have produced a forest management for nature guidebook (Naturschutzpraxisbuch) with a section dedicated to wild bees in forests (ÖBf 2017). The guidebook is aimed at all forest managers and is implemented across the whole state forest area, including both the 50% that is subject to nature protection regulations (Natura 2000 and/or other protection status), and the rest of the area. Implementation is guided by the four regional nature area managers, and regularly controlled.

Other landscape or local level initiatives

All Austria initiative:

- The initiative Natur Verbindet is encouraging the creation and maintenance of flowering fields and margins, with citizens, local authorities, farmers and other land managers and gardeners, schools, in all regions of Austria. The Naturschutzbund NGO runs it with funding from the Bienenschutzfonds, which was set up by the Hofer supermarket chain. Participants have recorded nearly 800 ha in an online database up to this time. See below for details of the other activities of the initiative.

Federal state Vorarlberg:

The Vorarlberg government funds local authorities to carry out a range of projects for pollinators and other biodiversity in its Naturvielfalt in der Gemeinde campaign. For example:

- The Netzwerk Blühendes Vorarlberg (network flowering landscapes in Vorarlberg) is leading pilot projects to create pollinator habitats in schools and nurseries, orchards, on road edges and along waterways across the federal state of Vorarlberg. It is a collaboration between an NGO (the Bodensee Akademie), the Vorarlberg regional government, and the beekeeper association (Imkerverband) of Vorarlberg. See below for details of the other activities of the initiative.
- The wild bee project In Zukunft Bunt und Artenreich plus follow up project Natürlich Bunt und Artenreich was set up by the Lustenau and Rankweil local governments and 16 neighbouring local governments in the federal state of Vorarlberg, with funding from the EU Interreg programme. By engaging local government employees, mayors and councillors, and citizens, together with local nature conservation experts, a nature garden expert, and a wild bee expert, it created or restored over 20 ha of flowering areas in urban spaces such as road verges, roundabouts and squares over a period of three years. Wild bee expert Timo Kopf is monitoring wild bee populations in some created areas in Rankweil, and in 2014 he found 93 species of wild bee including five that were new records for Vorarlberg, whilst in 2018 the total came to 116 species (Kopf, 2015; Kopf, 2018). The total count is 136 species. Now another EU Interreg funded project Bürger-Bienen-Biodiversität is engaging citizens to become flower ambassadors for wild pollinators, to reach out to garden owners and local green space managers, and is offering training and advice materials.

Federal state Salzburg (with German federal state Bavaria):

- Three regional protected areas (two biosphere regions and a regional park) in Austria (federal state Salzburg) and Germany (federal state Bayern) are taking part in a cross-border project (Wild und kultiviert - Regionale Vielfalt säen) using EU Interreg funding. They are collecting seed mixes from the most biodiverse meadows and seeds from local endangered arable weed species and sowing them out in new areas to create more habitat for wild bees both inside and around the protected areas.

City initiatives:

- The city of Vienna habitat and species action plan 2012 to 2015 created or protected a number of wild bee habitats. The bee check list for the city records 456 species, a third of the total number for Austria (Zettel et al, 2015).
- Vienna is partnering with Bratislava in Slovakia in the EU Interreg funded project Blühlinge – flowering landscapes for butterflies in Austria and Slovakia – to build up a network of habitats for butterflies in both cities and across the border between them. The project is working with local authorities, gardeners, schools, the city green space managers, the railway, the military and other partners.

MEASURES ON PESTICIDES

The Austrian agri-environment programme (ÖPUL 2015) includes several measures that support a reduction or a complete stop in the use of chemical-synthetic pesticide applications. Agri-environment payments are available for reducing chemical-synthetic pesticide use on animal feed crops and grassland and in vineyards.

Organic farming makes an important contribution to the conservation of pollinators with its total ban on chemical plant protection products on all agricultural areas and its diversified crop rotations. In 2016, nearly 22% (approximately 570,000 ha) of the agricultural area in Austria was managed organically by almost 22,000 agricultural holdings (around 19% of holdings).

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

TRAINING AND AWARENESS RAISING CAMPAIGNS

- The national environment ministry coordinates the 'Vielfalt leben' national biodiversity awareness-raising campaign.
- Farmers participating in the agri-environment-climate scheme „Environmentally sound and biodiversity-promoting management" (UBB) must take part in training on environmental priorities including biodiversity with a mention of insects.
- In the campaign **biodiversity monitoring with farmers** (Biodiversitätsmonitoring mit LandwirtInnen), farmers are trained to monitor specific grassland plants and animals on their farms. Ecological experts visit the farmers, define the species to monitor and train the farmers.
- The Naturschutzbund NGO run **wild pollinator identification courses** and **courses for squash (pumpkin) growers** in how to promote and rear bumblebees for crop pollination (linked to their Natur Verbindet initiative). They also offer **training days** for local authorities, land managers and gardeners. The project also organises events and a **meadow competition**.
- The Netzwerk Blühendes Vorarlberg (network flowering landscapes in Vorarlberg) is carrying out **awareness raising activities** (presentations, events, website, media releases) and **training and information materials** for use by the network partners and other local groups. It is also building up a **network of local expertise** in the federal state of Vorarlberg, for example with businesses selling native and local seeds, farm advisors, and land managers.
- The federal state Vorarlberg in its Naturvielfalt in der Gemeinde campaign has run two three-year **courses for public employees who manage green spaces and gardens**, with advice on how to make them more pollinator friendly. It has also run seminars on herbicide free management, targeted at private businesses (Natur und Wirtschaft) and cemetery managers (Naturoase Friedhof).
- A state-sponsored nature excursions programme in the federal state Oberösterreich offers **wild bee excursions** (Veranstaltungsreihe Naturschauspiel Oberösterreich).

EDUCATIONAL CAMPAIGNS AND MATERIALS ON WILD POLLINATORS

- The Natur Verbindet initiative organises **educational projects with schoolchildren** involving for example planting early spring flowers.

- The campaign **biodiversity monitoring with farmers** (Biodiversitätsmonitoring mit LandwirtInnen) has produced guidance materials including species factsheets and identification guides for farmers to use on their farms (ÖKL 2017). The factsheets cover 15 butterfly species as well as pollinators in general (see educational materials below).
- The **environmental education centre** Natopia together with the Raiffeisen bank offer wild bee educational sessions for primary and secondary school classes and promote wild bee nesting aids. Schools and citizens are encouraged to register their wild bee hotels on a map of Tirol (wildbienen.at).
- The NGO Naturschutzbund Östereich und die Austrian state forest agencies (Österreichische Bundesforste) are organising educational activities about wild bees in state forest areas. For example, schoolchildren helped restore a wildflower meadow for wild bees in the state forest Traun-Innviertel in spring 2018.

CITIZEN ENGAGEMENT CAMPAIGNS

- The **citizen science platform** Naturbeobachtung.at collects bumblebee species reports from citizens and provides a bumblebee identification service. This is managed by the NGO Naturschutzbund. Observers submit geo-referenced occurrence records and photos which are validated by experts, which makes the data useful for monitoring. In 2013, over 5000 occurrence records were submitted, of which at least 4000 are scientifically valid records (meaning that the species of bumblebee could be reliably determined by an expert).
- The foundation Blühendes Österreich and the NGO GLOBAL 2000 are running a citizen science campaign to collect butterfly records from citizens using an app (Schmetterlings-app). The 2018 butterfly data campaign reports that over 13,000 citizens recorded around 90,000 observations of 142 species, i.e. two thirds of the national total of 215 (Höttinger 2019). 80% of observations were of butterflies, 20% of moths.
- The campaign **biodiversity monitoring with farmers** (Biodiversitätsmonitoring mit LandwirtInnen) engages farmers in biodiversity monitoring on their farms.
- Two protected areas in the federal state Salzburg have established **wild pollinator visitor centres**, with EU-Interreg funding (Wild und kultiviert - Regionale Vielfalt säen). The centres now offer week-long wild pollinator identification courses for specialists and 1 or 2 day courses for the interested public.

PRIVATE SECTOR INITIATIVES FOR WILD POLLINATORS

- REWE International AG (a leading retail and tourism group) funds the foundation Blühendes Österreich which runs several citizen science and pollinator engagement campaigns (see above).
- The Hofer supermarket chain funds the Bienenschutzfonds, which supports the Naturschutzbund NGO initiatives for wild pollinators (such as the Naturbeobachtung.at citizen science platform). It markets pumpkin seed oil („Iss echt steirisch“ Kürbiskernöl) produced by farmers who have engaged in pollinator promotion projects.

- Other supermarkets in Austria such as Spar promote honeybees and organic honey as consumers are sensitive to the quality of honey and the value of bees, but their campaigns do not feature wild pollinators.
- The Austrian national railway network ÖBB has an initiative Blühende Landschaften, to maintain bee-friendly areas and set up wild bee hotels on the land belonging to the railways. National railway network employees are running the initiative.
- A number of businesses, such as the PORR Group building machinery company, promote beekeeping and wild bee hotels.

APICULTURE SECTOR INITIATIVES FOR WILD POLLINATORS

- Beekeepers have initiated the signposting of footpaths as bee learning walks in many areas, usually focused on honeybees and beehives, but a few also inform about wild pollinators (for example the Bienenerlebnisweg in Seeham).
- Beekeepers cooperate with stakeholders as part of the national biodiversity campaign "vielfaltleben", for example by placing beehives in prominent urban locations to raise awareness (BMLFUW personal communication).

REFERENCES

AGES (2012) Monitoring-Projekt "Überwachungsprogramm zur Überprüfung der tatsächlichen Exposition von Honigbienen gegenüber Clothianidin, Thiamethoxam, Fipronil und Imidacloprid in von Bienen für die Futtersuche oder von Imkern genutzten Gebieten". Abschlussbericht. Available at https://www.ages.at/download/0/0/2acb00e8e0f7c6477a511b052482ab4985d771fb/fileadmin/AGES2015/Themen/Umwelt_Bilder/Bienen/Monitoringprojekt_Bienen_Abschlussbericht_2012.pdf

AGES (2013) "Untersuchungen zur Identifizierung einer möglichen Exposition von Honigbienen gegenüber den Wirkstoffen Clothianidin, Thiamethoxam, Imidacloprid und Fipronil unter Feldbedingungen" Akronym: „Bienexpo 13". Abschlussbericht. Available at https://www.ages.at/fileadmin/_migrated/content_uploads/v1-Abschlussbericht_Bienenexposition-Ueberwachungsprogramm_2013__Bienexpo_13_.pdf

Anon (2017) Information on initiatives and activities to promote the conservation and sustainable use of pollinators for the Convention on Biological Diversity (CBD). Vienna, unpublished.

Ebmer, A.W. (1999) Rote Liste der Bienen Kärntens. In: W. E. HOLZINGER, P. MILDNER, T. ROTTENBURG & C. WIESER (Hrsg.): Rote Listen gefährdeter Tiere Kärntens. Naturschutz in Kärnten 15: 239 – 266. Klagenfurt. Available at https://www.zobodat.at/pdf/Pub-Natsch-Knt_1999_RL_0239-0266.pdf (accessed 4/3/2019)

Höttinger H, Pennerstorfer J (2005) Rote Liste der Tagschmetterlinge Österreichs (Lepidoptera: Papilionoidea & Hesperioidea). In: Zulka KP (ed) Rote Listen gefährdeter Tiere Österreichs. Checklisten, Gefährdungsanalysen, Handlungsbedarf. Teil 1: Säugetiere, Vögel, Heuschrecken, Wasserkäfer, Netzflügler, Schnabelfliegen, Tagfalter, vol 14/1. Grüne Reihe des Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft.

Bundesministeriums für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft. Gesamtherausgeberin Ruth Wallner, Wien, pp 313–354

Höttinger, H (2019) Schmetterlinge Österreichs: Wissenschaftlicher Abschlussbericht der Schmetterlingszählung 2018. Blühendes Osterreich – REWE International gemeinnützige Privatstiftung und Umweltschutzorganisation GLOBAL 2000/Friends of the Earth Austria, Wien. https://schmetterlingsapp.at/files/Bluehendes_Oesterreich_Schmetterlinge_wissenschaftlicher_Bericht_2018.pdf

Huemer P (2013) Die Schmetterlinge Österreichs (Lepidoptera). Systematische und faunistische Checkliste, vol 12. Studiohefte. Tiroler Landesmuseen, Innsbruck

Huemer P, Wiesmair B (2017) DNA-Barcoding der Tagfalter (Lepidoptera, Papilionoidea)—Unbekannte genetische Vielfalt im Zentrum Europas. In: Meighörner W (ed) Wissenschaftliches Jahrbuch der Tiroler Landesmuseen 2017. Tiroler Landes museum, Innsbruck, pp 9–33

Hussain, R I, Walcher, R, Brandl, D, Jernej, I, Arnberger, A, Zaller, J G and Frank, T (2018) Influence of abandonment on syrphid assemblages in mountainous meadows. *Journal of Applied Entomology* No 142 (4), 450-456. https://doi.org/10.1111/jen.12482

Kopf, T. (2015) „Zukunft bunt und artenreich“ Evaluierung der Maßnahmen im Gemeindegebiet Rankweil für Arthropoden, Projektteil Wildbienen. Im Auftrag der Vorarlberger Landesregierung, Bregenz.

Kopf, T. (2018) „Zukunft bunt und artenreich“ Insektenmonitoring an ausgewählten Flächen in Rankweil / Vbg Evaluierung im Auftrag der Vorarlberger Landesregierung Abt. Umwelt, Natur und Umweltschutz.

ÖBf (2017) Naturschutzpraxisbuch - Naturschutzmaßnahmen als Beitrag zum Ökologischen Landschaftsmanagement. Österreichische Bundesforste AG, Stabsstelle Wald-Naturraum-Nachhaltigkeit, Kompetenzfeld Naturschutz. Available at: https://www.bundesforste.at/fileadmin/naturraummanagement/Naturschutz/OEBf-Naturschutzpraxisbuch.pdf

Ockermüller E. & Zettel H. (2016) Faunistische Erfassung der WildbienenDiversität (Hymenoptera: Apidae) in Ritzing (Österreich, Burgenland) mit besonderer Berücksichtigung der Wegränder. – *Entomologica Austriaca* 23: 29–62.

Schwarzl, B. & Sedy, K. (2015) Wildbienenparadies Österreich? Aktuelle Umweltsituation – Identification von Gefahren und Lösungen im Wald. Umweltbundesamt, Vienna. Available at: https://www.bundesforste.at/uploads/publikationen/Studie_Wildbienenparadies_OEsterreich_Aktuelle_Umweltsituation_im_Wald.pdf

Sedy, K and Götzl, M (2015) Wildbienenparadies Österreich? Aktuelle Umweltsituation — Identifikation von Gefahren und Lösungen bei der Landbewirtschaftung. Umweltbundesamt, Wien. Available at http://www.umweltbundesamt.at/aktuell/presse/lastnews/news2015/news_150618/ (accessed 4/3/2019)

Schuster, R (ed) (2012) Checklisten der Fauna Oesterreichs No 6. Fritz Gusenleitner, Max Schwarz, Karl Mazzucco - Apidae (Insecta: Hymenoptera). Biosystematics and Ecology Series Band 29. VOAW. Available at https://verlag.oeaw.ac.at/checklisten-fauna-oesterreichs-no-6

UBA (2018) Rote Listen: Amphibien und Reptilien, Fische, Flusskrebse etc. Available at http://www.umweltbundesamt.at/umweltsituation/naturschutz/artenschutz/downloads_rl-tiere/ (accessed 4/3/2019)

Zettel, H., Ockermüller, E., Wiesbauer, H., Ebmer, A.W., Gusenleitner, F., Neumayer, J., Pächinger, B. (2015) Kommentierte Liste der aus Wien (Österreich) nachgewiesenen Bienenarten (Hymenoptera: Apidae). Zeitschrift

der Arbeitsgemeinschaft Österreichischer Entomologen 67: 137-194.
http://www.entomologie.at/uploads/www.entomologie.at/67_137-194_zettel_et_al.pdf

Educational materials

Farmers

ÖKL (2017) Wir Schauen auf Unsere Wiesen. Landwirtinnen und Landwirte beobachten Pflanzen & Tiere. Steckbriefe. Österreichisches Kuratorium für Landtechnik und Landentwicklung, Austria. Available at: http://wiese.biodiversitaetsmonitoring.at/images/Pdfuploads/2017_steckbriefe/Tal_Steckbriefe_2017.pdf
Language: German

Foresters

ÖBf (2017) Naturschutzpraxisbuch - Naturschutzmaßnahmen als Beitrag zum Ökologischen Landschaftsmanagement. Österreichische Bundesforste AG, Stabsstelle Wald-Naturraum-Nachhaltigkeit, Kompetenzfeld Naturschutz. Available at:
https://www.bundesforste.at/fileadmin/naturraummanagement/Naturschutz/OEBf-Naturschutzpraxisbuch.pdf

Schoolchildren

The Austrian environment ministry promotes the following:

WWF Switzerland Biodiversität Dossier für Lehrpersonen (Biodiversity teaching pack for teachers). Lesson plans about biodiversity with teaching aids to tell a story and a short play about wild bees, and to build bee nesting houses. Target: schoolchildren aged 8-12. Language: german. https://www.wwf.ch/sites/default/files/doc-2018-08/2018-03-lehrmittel-biodiversitaet.pdf

Citizens

Merkblatt Wildbienen fördern! Naturschutzbund. www.naturverbindet.at. A 2-page flyer describing ways in which citizens can help wild bees, available at:

https://naturschutzbund.at/files/NATUR%20VERBINDET/Wildbienen_foerdern1.pdf