
Bees of Oregon

2025



Oregon State
University



Oregon State University
Extension Service
Master Melittologist



Oregon State University
Honey Bee Lab

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The Bees of Oregon: 2025

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Suggested Citation: Best, L.R., Caron, D., Jackson, A.S., Melathopoulos, A., Rampton, R., & R. Sagili. (2026, May). Bees of Oregon 2025. Department of Horticulture, Oregon State University, Corvallis, Oregon, USA. <https://doi.org/10.5399/osu/1198>

Table of Contents

Executive Summary	1
The Oregon Bee Project.....	2
Progress on Goals.....	3
Goal 1: Protect Bees from Toxic Pesticide Exposure.....	3
Goal 2: Enhance Bee Habitat.....	6
Goal 3: Slow the Spread of Exotic Bees, Diseases, and Pests.....	8
Goal 4: Expand Our Understanding of the Bees of Oregon.....	10
Goal 5: Make the Oregon Bee Project Sustainable.....	13
Honey Bee Health: Current Status and Threats.....	15
Beekeeping in Oregon.....	15
Crop Pollination.....	15
Trends in Colony Health.....	17
The Oregon Bee Atlas.....	19
Oregon Bee Atlas Collection Methods.....	19
Bee Species Richness Summaries.....	20
Tracking Specimen Identification Progress.....	22
Oregon Bee Atlas State Taxa List.....	24
Ecoregion Profiles.....	34
Blue Mountains.....	36
Cascades.....	49
Coast Range.....	59
Columbia Plateau.....	66
Eastern Cascades Slopes and Foothills.....	75
Klamath Mountains.....	87
Northern Basin and Range.....	98
Snake River Plain.....	111
Willamette Valley.....	118
References.....	126
Appendix 1: County Summaries.....	128
Appendix 2: Acknowledgements and Funding.....	131
Contributors.....	131
Funding.....	133

Executive Summary

The Bees of Oregon 2025 report outlines several key areas of progress for bee health in the state across three broad areas, the Oregon Bee Project, honey bee colony survival, and the Oregon Bee Atlas.

The Oregon Bee Project is a collaborative initiative led by the Oregon State University (OSU) Extension Service in partnership with state agencies for agriculture, forestry, and transportation. Established after the 2014 Legislative Task Force on Pollinator Health, the Project focuses on reducing pesticide exposure, increasing habitat, and monitoring exotic pests. The Project is currently nearing the end of its Second Strategic Plan (2022-2027) and has met or exceeded many of its targets. It successfully trained over 12,000 licensed pesticide applicators, with 95% demonstrating comprehension of bee protection provisions, contributing to a downward trend in reported pesticide incidents documented by Oregon's Pesticide Analytical and Response Center (PARC). Training on creating bee habitat has been delivered to thousands of licensed pesticide applicators but also to the public through initiatives like the Bee Advocate and Bee Stewards programs, supported by the distribution of regional garden designs and seed packets. The Oregon Department of Agriculture (ODA) Insect Pest Prevention and Management (IPPM) program has been working with the Oregon Bee Atlas to track and conduct active surveillance against exotic bees and pests such as the Houdini fly and invasive hornets. The state has also built up considerable capacity to survey for wild bees through 275 OSU Master Melittologist volunteers and a series of reports and taxonomic guides developed through the OSU Melittology Lab. K-12 students at over 370 Oregon schools have been introduced to the richness of the state bee fauna through the Explore Oregon Bees activity book. Despite generating over \$800,000 since 2023 through the "Pollinator Paradise" license plate to fully support a bee taxonomist position and honey bee disease diagnostic positions at OSU, the project faces a funding gap in May 2026 as federal support for a coordination position ends.

This report also provides a summary of honey bee colony loss compiled by the Oregon State University Honey Bee Lab. The Lab has been tracking colony health among commercial honey bee colonies, as well as among hobby beekeepers by delivering a survey since 2010. Over this time there has been a decreasing trend of colony losses for hobbyist beekeepers but an increasing trend for commercial beekeepers. Commercial losses across this period, however, remain lower across this period compared to those of hobbyists (22% vs. 36%). Preliminary results for the 2025–2026 season show hobbyist losses at 22%, with commercial data still pending.

The Oregon Bee Atlas has grown into North America's largest contemporary state bee inventory, producing over 30,000 specimen records in 2025 alone. Supported by the nation's first Master Melittologist Extension program, the Atlas utilizes a network of highly trained volunteers to document bee biodiversity and bee-plant associations across the state's ecoregions. The project presents 567 bee species in this report, while DNA barcoding results provide evidence of nearly 200 additional species. These species combined with those awaiting identification among Atlas material, and those awaiting discovery in Oregon's diverse landscapes constitute an impressive fauna. The report provides a list of species collected since 2017, as well as Level III ecoregion summaries of common and uncommon bees and the plants they rely on. Based on these surveys, the Blue Mountains ecoregion currently represents the highest documented diversity in the state with 418 species. There are likely more bee species to be detected in the state, with over 100 species likely not detected in the Columbia River Plateau alone. These data are informing new conservation tools like the Melittoflora (melittoflora.org) that will enable Oregon to make more precise investment in bee habitat.

The Oregon Bee Project

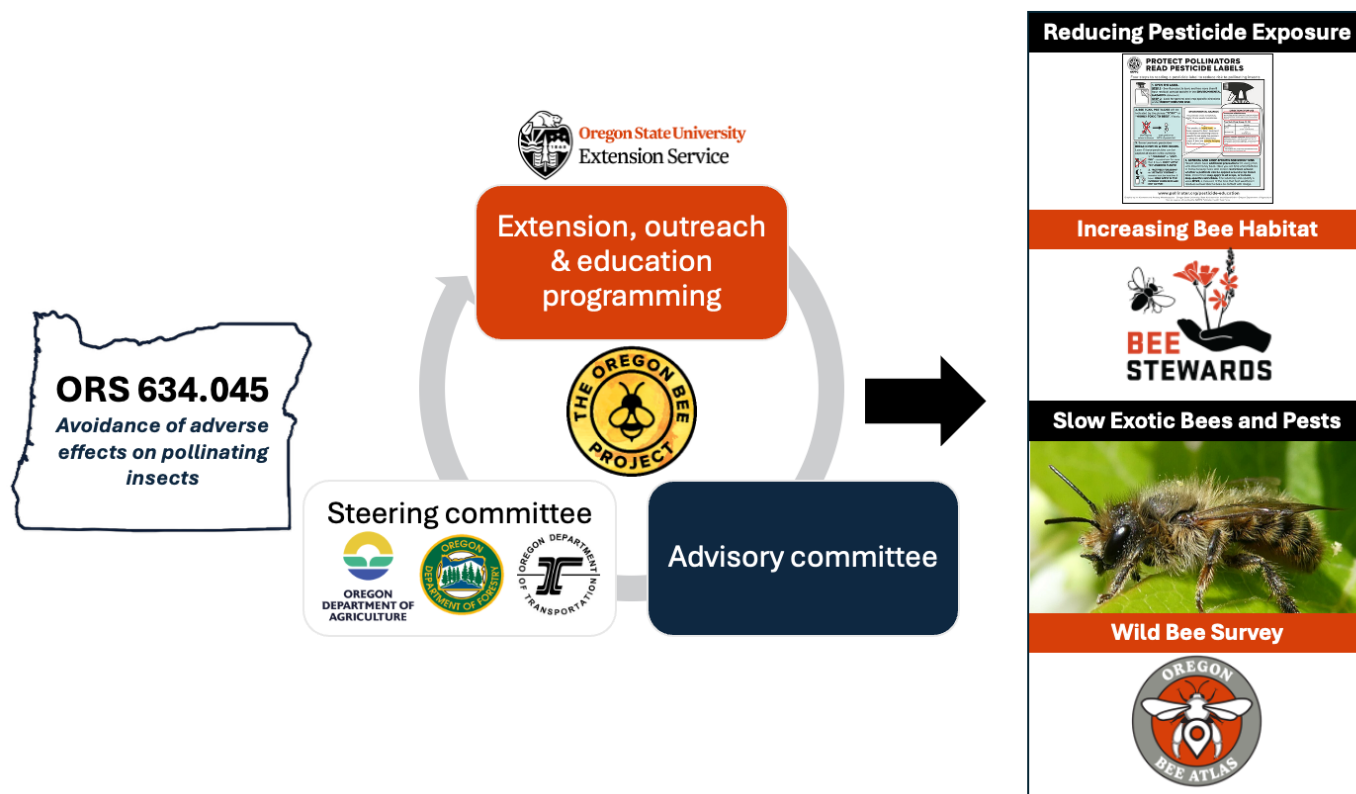


Figure 1: Organization of the Oregon Bee Project.

The Oregon Bee Project (**Figure 1**) is an initiative originating from the 2014 Legislative Task Force on Pollinator Health, which determined that Oregonians required better educational and informational resources to successfully conduct their work while protecting vital bee populations. To address this need, the Oregon State University Extension Service was charged with developing specialized programming and coordinating activities across state leadership (**ORS 634.045**). This collaboration is led by a steering committee representing the Oregon Department of Agriculture, the Oregon Department of Forestry, and the Oregon Department of Transportation. By integrating these state agencies with an Advisory Committee, the project maintains a continuous cycle of outreach and education focused on reducing pesticide exposure, increasing habitat, and slowing the spread of exotic pests and diseases.

Entering the final year of its **second Strategic Plan (2022–2027)**, the Oregon Bee Project has established itself as a national leader in bee protection and conservation through a multi-faceted approach centered on education, habitat enhancement, and wild bee survey. By 2026, the project **successfully trained over 12,000 licensed pesticide applicators** to understand protections for bees on pesticide labels and developed industry-specific protection protocols, contributing to a measurable downward trend in bee-related pesticide incidents reported to the state. Simultaneous efforts in habitat creation have reached thousands of Oregonians, bolstered by the innovative **Bee Stewards** program and the distribution of regional native plant cards and seed packs. To safeguard bees, the project maintains active surveillance against exotic threats such as introduced bumble bees and mason bees, Houdini fly, and invasive hornets. The **Oregon Bee Atlas** has grown into North America’s largest

contemporary state bee inventory, supported by the country’s first **Master Melittologist Extension** program. Despite its robust success and the generation of over \$800,000 through the “Pollinator Paradise” license plate to fund the Oregon Bee Atlas, the project faces a critical transition for its educational programs as federal coordination funding concludes in May 2026, highlighting the urgent need for sustainable support to bridge the gap and fulfill the remaining objectives of the 2027 strategic cycle.

Progress on Goals

Goal 1: Protect Bees from Toxic Pesticide Exposure



Progress toward the first goal of the Oregon Bee Project Strategic Plan—to protect bees from toxic pesticide exposure—is measured through a series of metrics focused on incident reduction, educational comprehension, and industry-level coordination. Central to this effort is the **training of licensed pesticide applicators**, such as farmers or public employees authorized to use restricted chemicals, on how to interpret “Pollinating Insect Hazard Statements” on pesticide labels to prevent accidental poisonings. The OSU Pollinator Health Extension program has reached over **12,000 licensed applicators** since the project’s inception (**Figure 2**), with post-training evaluations demonstrating that over 95% understand and can interpret bee-protection provisions on pesticide labels. These prevention efforts are bolstered by the development of industry-specific Bee Protection Protocols, which facilitate voluntary communication between land managers and beekeepers. In 2026, the program successfully expanded this framework by publishing the **Bee Protection Protocols (Figure 3)** for clover seed (Melathopoulos et al. 2026a), blueberries (Melathopoulos et al. 2026b) and western vegetable seeds (Melathopoulos et al. 2022) in the OSU Extension Catalog, alongside a new protocol for Oregon Mosquito and Vector Control Districts, and an upcoming guide for meadowfoam.

OSU Pollinator Health Extension also facilitated education on pesticide safety and bees to the general public. Information is delivered through a statewide network of **18** different organizations, including municipal parks departments, watershed councils, and local Master Gardener chapters, as well as OSU Master Melittologists. Public education is being facilitated by over **311 Bee Advocates** who have completed a rigorous 45-minute technical training covering the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Endangered Species Act (ESA), and state-level bee protection provisions. This network reached **4,732 Oregonians** across **11 counties** in **2025-2026**. This included 1,725 cards in English and Spanish focused on reducing toxic pesticide exposure to bees.

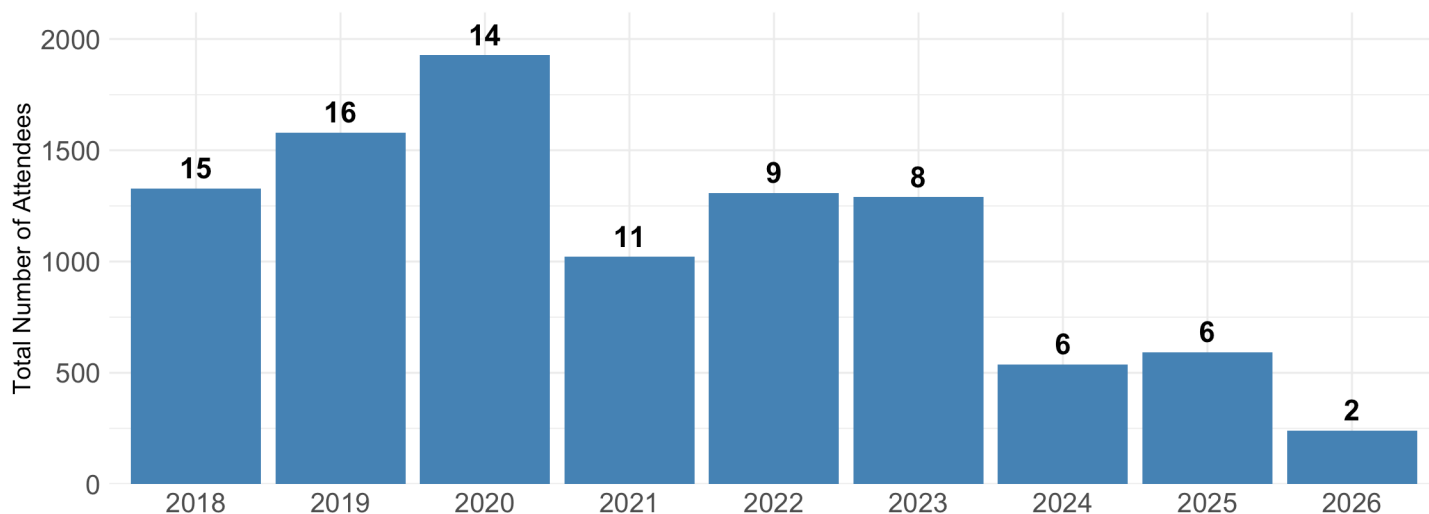


Figure 2: Annual frequency of training events to license pesticide applicators on pesticide safety to bees (2018–2026). Bars represent the total number of adult educational contacts (attendees) per year, while labels above each bar indicate the total number of individual presentations delivered annually. Total reach for this period is 12,372 applicators across 88 events.

Evidence of the success of this educational approach can be seen by the reduction in pesticide incidents reported to the **Oregon Department of Agriculture (ODA) Pesticide Division** and the results of their investigations. Pesticide investigations conducted by the ODA are primarily a complaint-driven process initiated by reports from the public or other agencies. Upon receiving a report, an ODA investigator performs a comprehensive field evaluation that includes interviewing involved parties, conducting site inspections, reviewing legally mandated pesticide application records, and collecting physical samples such as soil, water, vegetation and bees for laboratory analysis to determine if products were used in accordance with their federally registered labels. Since 2016, OSU has trained ODA investigators to evaluate dead or weakened honey bee colonies when complaints are associated with honey bees. This allows ODA investigators to distinguish the effect of pesticides from biological stressors like starvation, brood diseases, or Varroa mites. Data compiled by the **Pesticide Analytical and Response Center (PARC)** representing complaints and subsequent investigations indicates a general **downward**



Figure 3: A blueberry grower applying fungicide sprays in the evening to minimize exposure to honey bees contracted for pollination. This practice is a core component of the Blueberry Bee Protection Protocol, developed through a partnership between the Oregon State Beekeepers Association, the Oregon Blueberry Commission, and OSU Extension.

trend in bee-related pesticide complaints and investigations over the past decade (**Table 1**), with confirmed acute “bee kills” remaining rare, suggesting that the project’s emphasis on applicator training and industry coordination is contributing to low toxic pesticide exposure to bees.

Table 1: Summary of complaints reported to ODA’s Pesticide Analytical Response Center for bee-related pesticide incidents by fiscal year.

Fiscal Year	Received complaints	Investigated Complaints (& Reporting Party)	Confirmed Bee Kills
2014	9	6 (4 beekeepers, 2 hobbyists)	1 case (Avermectin detected)
2015	23	13 (4 beekeepers, 4 hobbyists, 5 others)	
2016	6	5 (3 beekeepers, 1 hobbyist, 1 other)	
2017	7	3 (2 beekeepers, 1 hobbyist)	1 case (Chlorpyrifos detected)
2018	5	1 (1 beekeeper)	
2019	7	0	
2020	13	4 (2 beekeepers, 2 hobbyists)	1 case (Fipronil detected)
2021	6	1 (1 beekeeper)	
2022	9	3 (2 beekeepers, 1 hobbyist)	
2023	1	1 (1 other)	
2024	3	2 (1 beekeeper, 1 hobbyist)	
2025	5	2 (2 others)	

Goal 2: Enhance Bee Habitat

5,000

Pesticide applicators
trained since 2018

300

Bee Advocates

4,100

Oregonians
reached in 2025

30

Bee Friendly
Wineries

There has been substantial progress in developing educational programs and resources for helping Oregonians create bee habitat. A cornerstone of this work has been the training of licensed pesticide applicators who primarily use herbicides. This training was developed by OSU Pollinator Health in 2021 and is titled: “**Vegetation management to control weeds + help bees**” and is available as a 60-min face-to-face training and as a self-paced course. The success of the training was facilitated by the ODA Pesticide Division creating a new recertification category that allows applicators to receive credit for learning how to create and maintain bee habitat. Since its inception, the training has delivered **14 events** reaching a total of **1,849 contacts**, ranging from forestry and right-of-way applicators to regional weed conferences and Department of Transportation personnel. Along with trainings to the public, habitat training has been delivered to **5,142 contacts** across **84 events** since 2018 (**Figures 4 and 5**).

A more advanced habitat training, the **Bee Stewards program**, was developed by the OSU Pollinator Health program in 2025. The program has seen **113 enrollments** and provides participants with technical expertise in site preparation, bee identification, and plant selection. A key element of the Bee Stewards program is an **automated Stewardship Report** that translates the findings from the Oregon Bee Atlas into recommendations on what to plant to support habitat for bees. The Stewardship Report has been implemented by **30 Oregon vineyards** in the **Oregon Bee Friendly Wine initiative**.



Figure 4: Master Melittologists, Bee Stewards, and Bee Advocates volunteer their time to reach the public with innovative ways to deliver high-quality information on bees and their essential habitat requirements.

To facilitate on-the-ground implementation, our network of volunteers and partner organizations (see previous section) distributed a high volume of regional resources in 2025, including 1,450 “West of the Cascades Native Plant Design” guides, 925 “Central and Southern Oregon Plant Design” guides, 640 “Where are Bees in the Forest?” infographic cards, and 3,200 native plant seed packets.

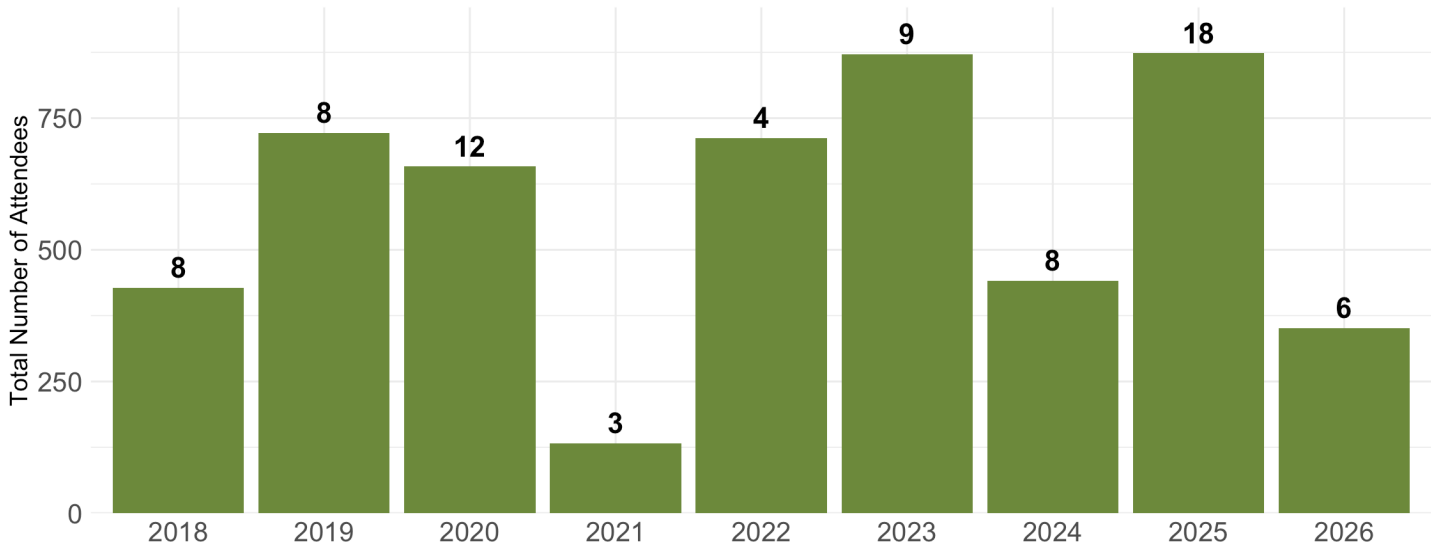


Figure 5: Annual educational reach and event numbers for “Creating Habitat” teaching events, including pesticide applicators, but also events for groups such as Master Gardeners (2018–2026). Bars represent the total number of adult educational contacts (attendees) per year, while labels above each bar indicate the total number of individual presentations delivered annually. Total reach for this period is 5,142 participants across 84 events.

Oregon Department of Forestry (ODF) has been working to enhance pollinator habitat in the Clatsop State Forest through seeding native seeds into burned slash piles to provide nectar sources for local pollinators in 2022, 2023 and 2024 (**Figure 6**). In 2024, **ODF** and **Oregon Department of Fish and Wildlife** established a 4-acre wildlife plot at Walker Meadow near Veneta. The site is located at about 2,300 feet and hosts wildfire detection cameras and communication towers. The site underwent extensive site preparation to remove stumps and invasive plant species. The site was seeded with a mix of Baby Blue Eyes (*Nemophila menziesii*), California Poppy (*Eschscholzia californica*), Lupine (*Lupinus* spp.), and Farewell to Spring (*Clarkia amoena*) among others. Additionally, the **Oregon Department of Transportation’s (ODOT) Special Management Area** program ensures that maintenance crews utilize specialized techniques in key areas to protect bee habitats. ODOT is currently investigating the role of mowing frequency on creating roadside bee and butterfly habitat.



Figure 6: Slash pile seeded with flowering Farewell to Spring (*Clarkia amoena*) in Clatsop State Forest by Oregon Department of Forestry.

Goal 3: Slow the Spread of Exotic Bees, Diseases, and Pests

0

Exotic mason bees
introduced since 2018

0

Exotic bumble
bees established

0

Exotic carpenter
bees established

1

Mason bee pest
introduced in 2020

The **ODA Insect Pest Prevention and Management (IPPM)** and Oregon Bee Atlas have been actively monitoring the introduction and spread of exotic bee species, diseases, and pests that threaten Oregon's managed and wild bees. ODA IPPM maintains an Approved Invertebrate List that also restricts the importation of bees and pests of bees. The list was updated in 2026. In addition, ODA IPPM also maintains a list of newly introduced insect species, including bees and bee pests. This list was updated in 2025.

Exotic mason bees have been a key focus of surveillance. A species that has been long established in the Willamette Valley is the **Japanese Horn-Face Bee** (*Osmia cornifrons*). Collections from the Oregon Bee Atlas indicate that the bee remains largely restricted to the Willamette Valley (**Figure 7**). Two adventive mason bees have not yet been detected in Oregon, namely the **Taurus Mason Bee** (*O. taurus*) and the **European Orchard Bee** (*O. cornuta*), although the former is now known from Boise, Idaho and the latter to southwestern British Columbia. A mason bee relative, the **European Small-Woolcarder Bee** (*Pseudoanthidium nanum*) was detected in the Portland area in 2020 and data from the Oregon Bee Atlas suggests it remains restricted to the northern part of the Willamette Valley.

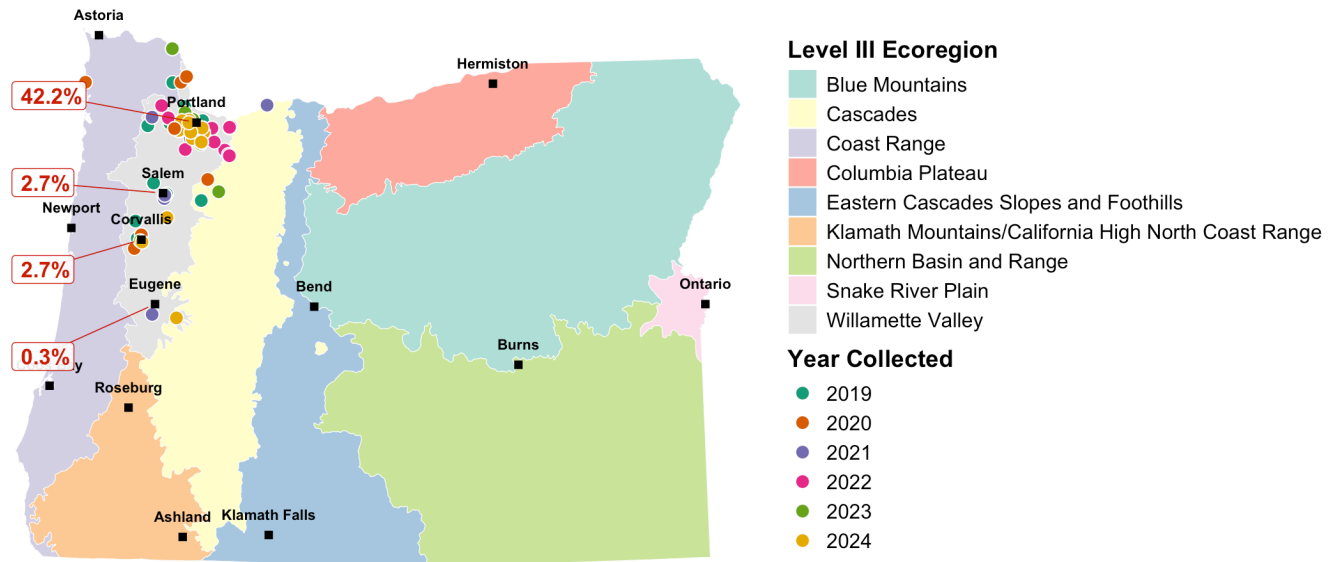


Figure 7: The map displays the distribution of *Osmia cornifrons* collection records from the Oregon Bee Atlas overlaid on EPA Level III Ecoregions (colored). Individual bee occurrences are represented by colored points categorized by the year of collection. Callouts to Portland, Salem, Corvallis, and Eugene indicate the percentage of total statewide records located within a 25-mile radius of each city center. The data indicates a primary concentration within the Willamette Valley ecoregion, with expanding occurrences documented along the coast and the foothills of the Cascades over the five-year period.

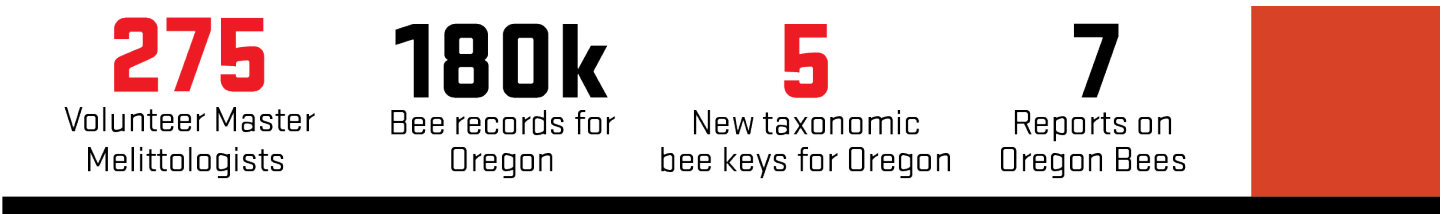
Two bees in the Family Apidae that are of concern to the state are the **Eastern Bumble Bee** (*Bombus impatiens*) and **Eastern Carpenter Bee** (*Xylocopa virginica*). Both *B. impatiens* and *X. virginica* were detected by Oregon Bee Atlas members in 2020, the former on the northern coast of Oregon and the latter in Corvallis. *B. impatiens* has not been detected since in spite of active monitoring at the same locale by ODA IPPM. To prevent the further introduction of such species, the **ODA IPPM continues to strictly exclude all bumble bee species not known to occur in Oregon**, including *B. impatiens*. The *X. virginica* nest was located in imported furniture and eradicated by an Oregon Bee Atlas member Jerry Paul (see **Appendix 2**) and has not been detected in Oregon since.

Beyond exotic bee species, the introduction of new pests and diseases remains a persistent risk to Oregon's bee health. A recent arrival of significant concern to both wild and managed Blue Orchard Bees (*Osmia lignaria*) is the **Houdini fly** (*Cacoexenus indagator*). As a depredator, this fly does not directly parasitize the bee larva; instead, its larvae consume the bee's pollen provision, effectively starving the bee. Originating from Europe, *C. indagator* was first detected in Oregon around 2020 and is now widespread throughout the Portland area, with recent detections extending as far south into the Willamette Valley as Salem.

Oregon honey bees face an emerging threat from parasitic mites in the genus *Tropilaelaps*. Historically restricted to Southeast Asia where they parasitize native Asian honey bees, these mites were first observed on European honey bees (*Apis mellifera*) in the Philippines in 1961. *Tropilaelaps mercedesae* (previously referred to as *T. clareae*) was confirmed parasitizing *A. mellifera* in Eastern Europe in 2024. While these mites have not yet been found in North America, they are a high-priority subject for active surveillance in the U.S.

Closer to home, the **Northern Giant Hornet** (*Vespa mandarinia*) was introduced into southwestern British Columbia and northwestern Washington State in 2019, but following a control program by Washington State Department of Agriculture it was declared eradicated by 2024. More recently, the **Yellow-Legged Hornet** (*Vespa velutina*) was detected in Georgia in 2023 and has since spread into South Carolina. In their native range in Asia, these two hornets are major predators of honey bees, posing a significant potential threat to managed colonies should they be introduced to Oregon.

Goal 4: Expand Our Understanding of the Bees of Oregon



The Oregon Bee Atlas is the largest contemporary state program for the inventory of bees in North America. A review of data will follow in the section below: **The Oregon Bee Atlas**. To support the goal of expanding our understanding of the Bees of Oregon, the OSU Melittology lab has developed a series of technical reports and identification keys (**Figure 8**). Additionally, the OSU Melittology lab is working with Master Melittologist volunteers and ODA IPPM on a **Checklist of Bees of Oregon**.

Technical Reports and Distribution Records

Best, L. R., J. D. Engler, A. S. Jackson, and A. P. Melathopoulos. (2026). **Bees of the Pacific Northwest: An initiative to DNA barcode the bees (Hymenoptera: Anthophila) of Oregon**. Technical Report. Department of Horticulture, Oregon State University, Corvallis, Oregon. <https://doi.org/10.5399/osu/1193>

Best, L. R., P. Coleman, A. S. Jackson, A. P. Melathopoulos, D. O’Loughlin, M. O’Loughlin, and R. Rampton. (2026). **Bees of the Pacific Northwest: Oregon Bee Atlas species occurrence records for bumble bees (Hymenoptera: Apidae: Bombus)**. Technical Report. Oregon Bee Atlas, Melittology Lab, Oregon State University. <https://doi.org/10.5399/osu/1194>

Jackson, A. S., P. Coleman, and L. R. Best. (2026). **Master Melittologist Program on Pacific Region 1 National Wildlife Refuges: 2025 Annual Report**. Department of Horticulture, Oregon State University, Corvallis, Oregon. <https://doi.org/10.5399/osu/1196>

Jackson, A. S., P. Coleman, and L. R. Best. (2025). **Master Melittologist Program on Pacific Region 1 National Wildlife Refuges: 2024 Season Report**. Department of Horticulture, Oregon State University, Corvallis, Oregon. <https://doi.org/10.5399/osu/1186>

Best, L., Engler, J., Feuerborn, C., Larsen, J., Lindh, B., Marshall, C.J., Melathopoulos, A., Kincaid, S. and Robinson, S.V., (2022). **Oregon Bee Atlas: wild bee findings from 2019**. Catalog: Oregon State Arthropod Collection, 6(1). http://dx.doi.org/10.5399/osu/cat_osac.6.1.4906.

Best, L., Marshall, C.J., Feuerborn, C., Kincaid, S., Melathopoulos, A. and Robinson, S.V., (2021). **Oregon Bee Atlas: native bee findings from 2018**. Catalog: Oregon State Arthropod Collection, 5(1). https://doi.org/10.5399/osu/cat_osac.5.1.4647

Best, L. R., C. J. Marshall, and S. Red-Laird. (2019). **Confirmed presence of the squash bee, *Peponapis pruinosa* (Say, 1837) in the state of Oregon and specimen-based observational records of *Peponapis* (Say, 1837) (Hymenoptera: Anthophila) in the Oregon State Arthropod Collection**. Catalog: Oregon State Arthropod Collection, 3(3), 2–6. https://doi.org/10.5399/osu/cat_osac.3.3.4614

Taxonomic Identification Keys

Gorman, M., J. D. Engler, A. S. Jackson, P. Coleman, M. Stanton, and L. R. Best. (2025). **Bees of the Pacific Northwest: Key to species for *Lasioglossum* subgenera *Lasioglossum* and *Leuchalictus* (Hymenoptera: Halictidae)**. Version 1. Department of Horticulture, Oregon State University, Corvallis, Oregon. <https://doi.org/10.5399/osu/1183>

Engler, J. D., M. Gorman, D. Cappaert, M. Stanton, L. R. Best, and A. S. Jackson. (2024). **Bees of the Pacific Northwest: Key to *Lasioglossum* species for females of the subgenera *Hemihalictus*, *Sphecodogastra*, and *Evyllaesus* in Oregon (Hymenoptera: Halictidae)**. Version 1. <https://doi.org/10.5399/osu/1171>

Best, L. R., J. B. Dunlap, A. S. Jackson, P. H. Williams, and J. W. Rivers. (2023). **Bees of the Pacific Northwest: Key to bumble bee species for females (Hymenoptera: Apidae: *Bombus*)**. Oregon State University Extension Service. <https://doi.org/10.5399/osu/1164>

Best, L. R., J. B. Dunlap, A. S. Jackson, P. H. Williams, and J. W. Rivers. (2023). **Bees of the Pacific Northwest: Key to bumble bee species for males (Hymenoptera: Apidae: *Bombus*)**. Oregon State University Extension Service. <https://doi.org/10.5399/osu/1165>

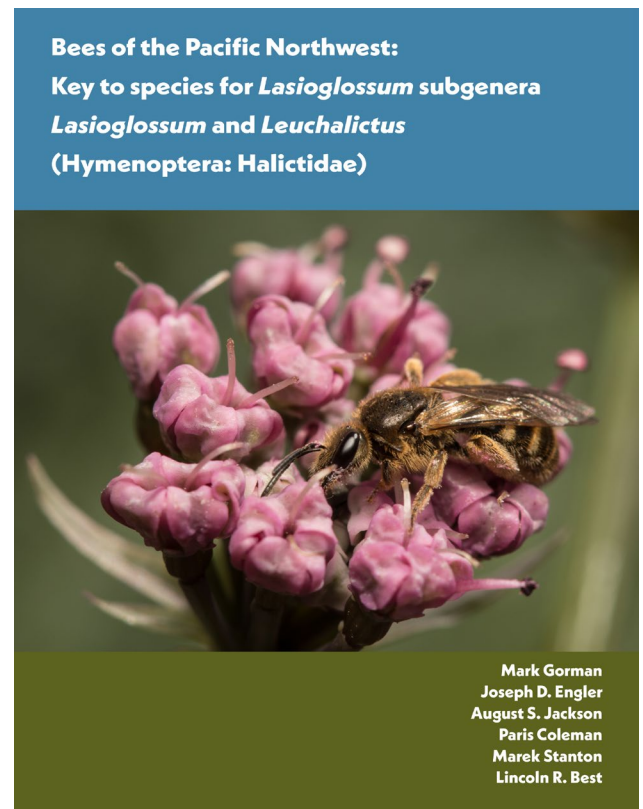


Figure 8: A recent regional identification key produced through the Melittology Lab at Oregon State University.

Best, L. R., J. B. Dunlap, A. S. Jackson, P. H. Williams, and J. W. Rivers. (2023). **Bees of the Pacific Northwest: Key to genera (Hymenoptera: Anthophila)**. Oregon State University Extension Service. <https://doi.org/10.5399/osu/1166>

These publications fulfill the Strategic Plan's mandate to transform volunteer-collected data into peer-reviewed taxonomic resources. By making these keys and reports publicly accessible, the program provides the necessary tools for land managers and scientists to make informed conservation decisions based on the hundreds of thousands of records generated by the Oregon Bee Atlas.

Master Melittologist Program

The OSU Master Melittologist program is the first Extension certificate program in the country dedicated to the study and survey of wild bees (**Figure 9**). While founded in Oregon, the program's influence has expanded significantly; it now trains volunteers in Washington, Idaho, New Mexico, and the Canadian province of British Columbia to support their respective state and provincial Atlas programs. The curriculum is structured into three progressive tiers: the Apprentice level, which focuses on fundamental survey techniques; the Journey level, which develops "para-taxonomists" capable of identifying the various bee genera within their region; and the newly formed Master level,



Figure 9: Master Melittologists before setting out to collect bees at Cottonwood Canyon State Park. Volunteers collect bees that are used for the Oregon Bee Atlas, Oregon's state inventory of bees.

which emphasizes independent, advanced study in the field of melittology. To date, the program has successfully registered 275 individuals at the Apprentice level and 16 at the Journey level, building a strong foundation for the Oregon Bee Atlas.

Master Melittologists have also taken the information from the Oregon Bee Atlas directly to Oregonians. In 2025, they participated in 62 distinct outreach events across the state. These highly trained volunteers provided an essential service by translating complex bee biology into actionable knowledge for the public. Their contributions ranged from leading hands-on wild bee identification workshops and “bee walks” in local parks to educational booths at county fairs and farmers’ markets. Beyond public engagement, these individuals served as critical data collectors for the Oregon Bee Atlas, spending thousands of hours in the field documenting bee-plant associations and contributing to a more precise understanding of the state’s wild bee biodiversity. By providing expert consultation on habitat design and delivering presentations to local garden clubs and conservation groups, Master Melittologists have become a vital bridge between communicating the findings of the Oregon Bee Atlas and empowering the practical conservation efforts of Oregonians.

Explore Oregon Bees

K-12 education on the bees of Oregon was advanced through the **Explore Oregon Bees**, a bee-themed agriculture and nutritional education initiative developed at OSU. At the heart of this program is a 70+ page activity book that is structured around bee-pollinated crops in Oregon and the bees associated with their pollination. The second edition (2023) included a map illustrating where bee-pollinated crops grow in Oregon, six bee-crop pairings, as well as pages on apiculture and the other managed bee pollinators of the region (alkali bees, alfalfa leafcutting bees and blue orchard mason bees). There are also pages that cover bee and pollination biology, 20 trading cards featuring the bees of Oregon, and numerous interactive activities that track fluency, provide math challenges, and guide students to explore bees and flowers directly. The second edition of the activity book was aligned to 4th grade educational standards in Oregon, which was the grade identified by teachers as having the greatest overlap for material in the activity book. In spring of 2024 through spring of 2025, as part of an **Oregon Department of Education** funded project, over 20,500 activity books were mailed to 692 teachers in 376 schools (for their PreK to 12th-grade classrooms) in 35 of the 36 Oregon counties, covering more than 115 school districts in 141 cities.

Goal 5: Make the Oregon Bee Project Sustainable



The Oregon Bee Project is anchored by state investment in a **Pollinator Health Extension Specialist at Oregon State University**. The position was created in 2016 and was the first of its kind in the U.S. To ensure the technical integrity of Oregon’s bee biodiversity data, the OSU Melittology program continues to fund a lead taxonomist for the Oregon Bee Atlas through proceeds from the **Pollinator Paradise license plate (Figure 10)**. These plate proceeds serve a dual purpose,

also providing vital laboratory technical support for the OSU Honey Bee Lab to assist in managed bee health research. In addition, thanks to a **Cooperative Agreement with The Pacific Region of the U.S. Fish and Wildlife Service**, the Oregon Bee Atlas has a second dedicated taxonomist focused on inventorying the bees in National Wildlife Refuges in the Pacific Northwest. The operating expenses of the Oregon Bee Atlas, including student workers and DNA barcoding, have been supported through a range of grants, state-partnerships and donations from Oregon companies and private individuals (**Appendix 2**). The OSU Pollinator Health Extension program successfully funded a **dedicated program coordinator** through a federal grant through the **USDA National Institute of Food and Agriculture (NIFA)** but this funding concludes in May 2026, highlighting the ongoing need for long-term coordination support. The printing of the Project’s educational materials has been sustained through a series of grants, most recently through **The BottleDrop Fund (2025)** and **NW Natural (2026)**. Maintaining these varied revenue streams is essential for the project to continue its work through 2027 and beyond.

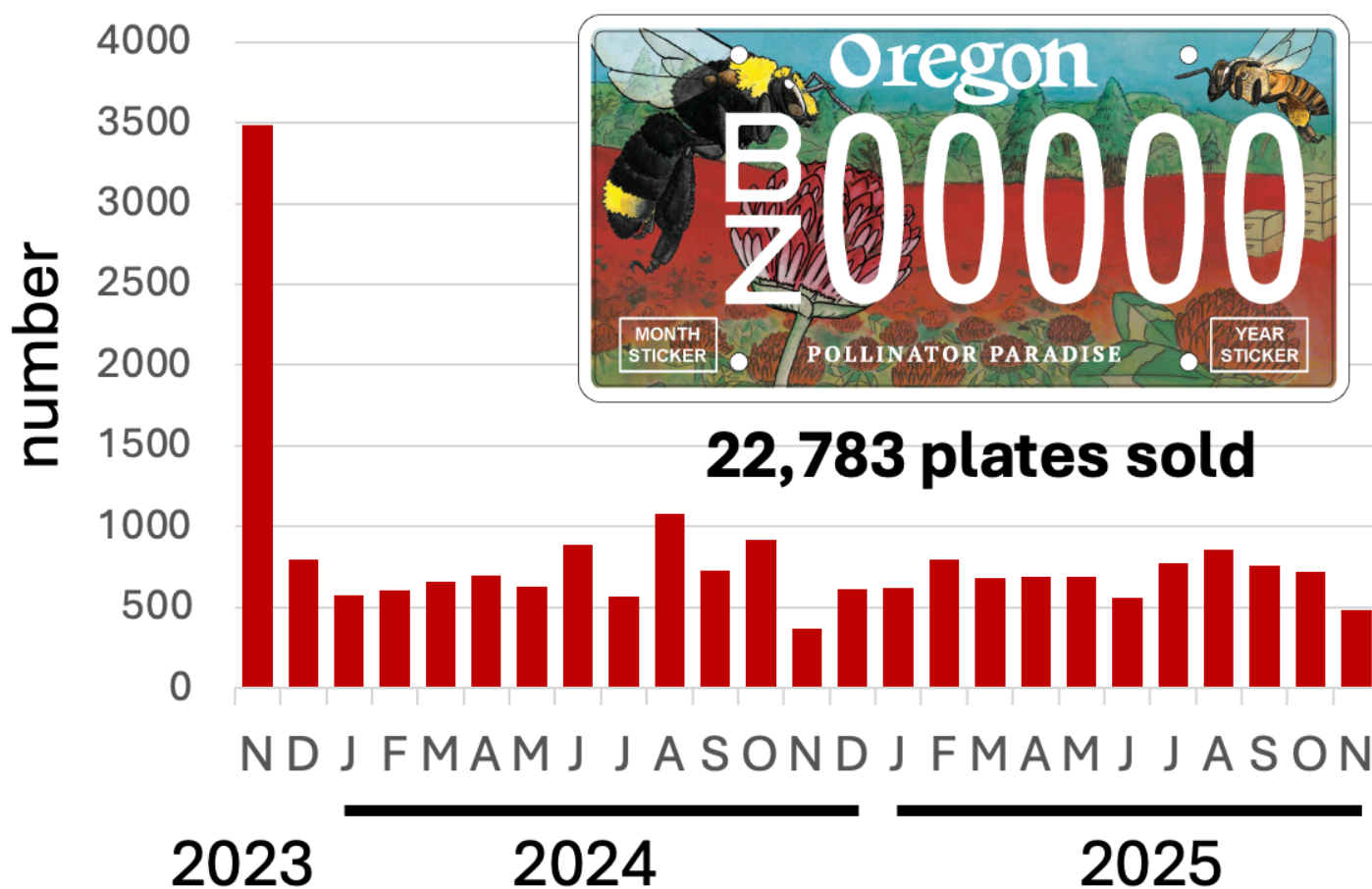


Figure 10: Monthly and total sales of the Oregon “Pollinator Paradise” license plate (November 2023–November 2025). Launched in November 2023, the plate features the wild yellow-faced bumble bee (*Bombus vosnesenskii*) and the managed honey bee (*Apis mellifera*), designed by Master Melittologist Marek Stanton. The initial spike in November 2023 represents the fulfillment of over 3,000 pre-sale vouchers. As of late 2025, 22,783 plates have been sold, generating over \$800,000 in total surcharges, with \$35 from each \$40 sale directly funding the OSU Honey Bee Lab and the Oregon Bee Atlas.

Honey Bee Health: Current Status and Threats

Beekeeping in Oregon

Honey bees are vital to Oregon's agricultural sector. The economic value of honey bee pollination services to agricultural crops in Oregon is estimated to be approximately \$600 million annually. The USDA National Agricultural Statistics Service (NASS) estimates that there are 84,000 honey producing colonies in Oregon. There are an estimated **25 large scale commercial beekeepers** averaging 3500 to 5000 colonies and another **30 sideliners** - individuals managing 50 to 500 honey bee colonies (**Figure 6**).

There are an unknown number of Oregon individuals (estimates range from 500 to 2000) keeping honey bee colonies on a small scale. These **backyard beekeepers** (also termed small-scale or hobbyists) keep anywhere from one to 50 colonies (on average 3-4 colonies). They keep bees primarily as a hobby, to meet honey needs of family and friends and for small scale pollination of native and introduced flora. Over **300 individuals** have participated in the **Oregon Master Beekeeper program** since establishment in 2014.

Crop Pollination

Oregon's large-scale commercial beekeepers obtain more than 50% of their income from rental of their colonies to farmers for pollination services in California, Washington, Idaho, and Oregon. The commercial beekeepers in Oregon **pollinate on average more than 5 different crops in a year**, including California almonds (**Figures 11 & 12**).

The bee rental season starts each year in late January, when Oregon bee hives are loaded onto semi-trucks and moved to almond orchards in the Central Valley of California for almond pollination. The beekeepers start stimulating and strengthening colonies right after the New Year. The strong colonies that meet pollination standards are moved into California from late January to the middle of February and are returned to Oregon in early March. Almond bloom is a major source of pollen and nectar, resulting in strong colonies with rapid spring population expansion.

Beekeepers then manipulate these strong colonies to prepare them for spring pollination closer to home in fruit orchards (cherry, pear, apple, etc.), seed crops (mustard, turnip, cabbage, meadowfoam, crimson clover etc.) and blueberries and cane berries. Strong colonies are divided to make smaller nuc (nucleus) colonies sold to beginner beekeepers or used to make up overwintering losses. In summer, these same colonies pollinate additional vegetable seed crops (carrot, radish, etc.), forage seeds (primarily red and white clover), cranberries, squash, watermelons, and oil seeds (primarily canola in eastern Oregon). Alfalfa seed grown in eastern Oregon is one of the few crops that is not honey bee pollinated, and is pollinated instead by alfalfa leafcutting bees (*Megachile rotundata*) and alkali bees (*Nomia melanderi*). In between crop pollination, some colonies are placed in locations with a high density of forage that provides surplus honey for extraction and wholesale.



Figure 11: Commercial honey bees in Oregon are important for pollinating crops like highbush blueberry.

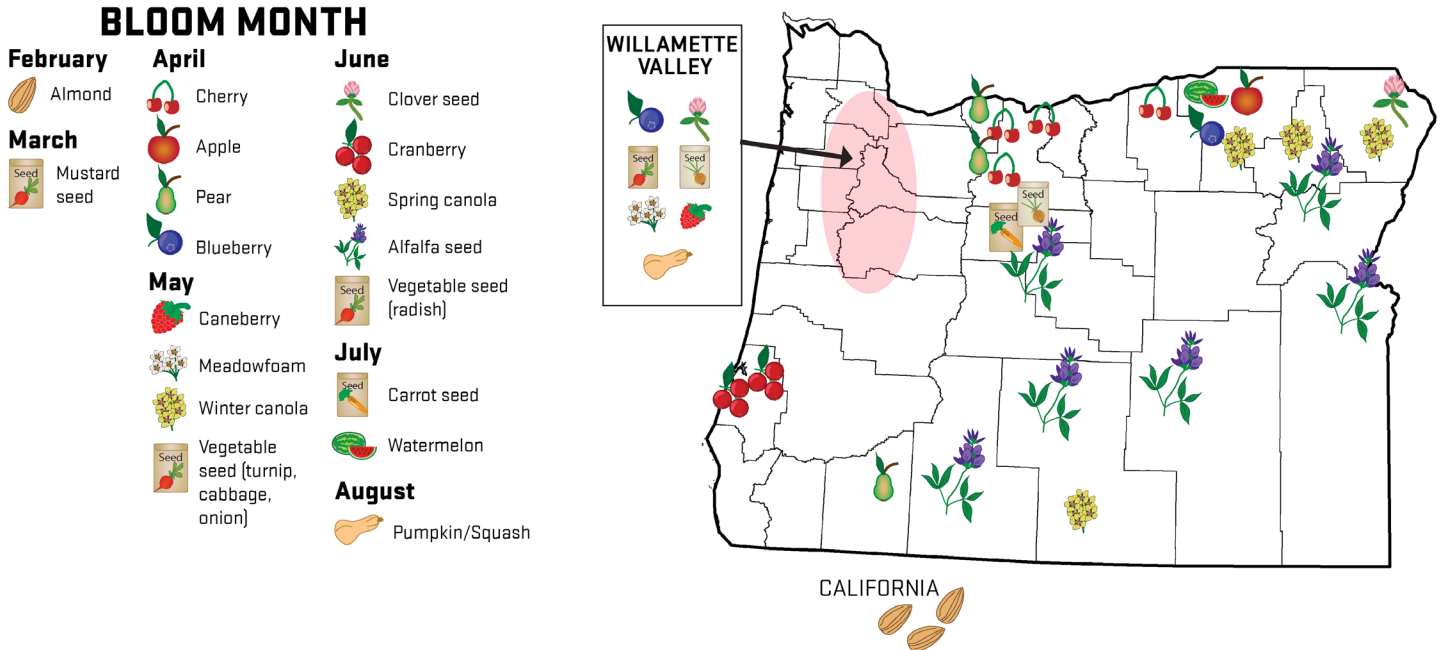


Figure 12: Bee pollinated crops of Oregon. Honey bees are the primary pollinators for all Oregon crops apart from alfalfa seed. Bumble bees also contribute significant pollination to red clover seed and cranberries. Oregon honey bees largely travel to California in February to pollinate almonds.

Trends in Colony Health

Honey bees are facing multiple stressors including parasites and diseases, poor nutrition and exposure to pesticides. Among these multiple stressors affecting honey bees, the ectoparasitic mite *Varroa destructor* is the most damaging and persistent threat as OSU graduate students Cameron Jack and James Ellis (2021) and Mustafa Bozkus (2025) have documented in recent research publications (**Figure 13**).

The OSU Honey Bee Lab organizes its research efforts around three areas designed to bolster apicultural resilience and support the vital role of Oregon's beekeeping industry: colony health, nutritional requirements, and pollination efficacy. By integrating these research domains, the lab has worked to mitigate biological stressors, improve annual survival rates, and ensure the long-term productivity of both pollination services and honey production within the state.



Figure 13: A beekeeper sampling colonies for the parasitic mite *Varroa destructor*. This mite remains the most significant pest of honey bees, contributing to high annual colony losses.

Beginning in 2010, the OSU Honey Bee Lab initiated an **annual monitoring effort** focused on **backyard beekeepers** to track colony attrition during the critical overwintering window from October through March. These data are hosted and disseminated electronically via the Pacific Northwest Honey Bee Survey portal. This effort is complemented by a paper survey of **commercial and sideliner beekeepers** managing 50 or more colonies, providing a comprehensive view of honey bee health across all sectors of the industry.

The survey has shown a decreasing trend of honey bee colony loss over the winter among hobby beekeepers, but an increasing trend in losses for commercial beekeepers over the past 16 years (**Figure 14**). Nevertheless, average commercial honey bee colony losses across this period remain lower than hobby beekeepers (22% vs 36%). Preliminary results for the current overwintering season (October 2025 to March 2026 - not shown on Figure 14) indicate that backyard beekeeper's losses were at 22% (approximately 2400 colonies overwintered by 416 respondents) while figures on commercial colony losses are still pending. On average over the past 10 years, surveys have represented 1300 colonies (range 988-1564) from 275 individuals - (range 171-416). The trends in commercial colony loss reported to the OSU Honey Bee Lab mirror those observed in a national colony loss survey conducted by the Bee Informed Partnership and continued for the last three years jointly by Auburn and Oregon State Universities (Giacobino et al. 2024, 2025, Bruckner et al. 2023).

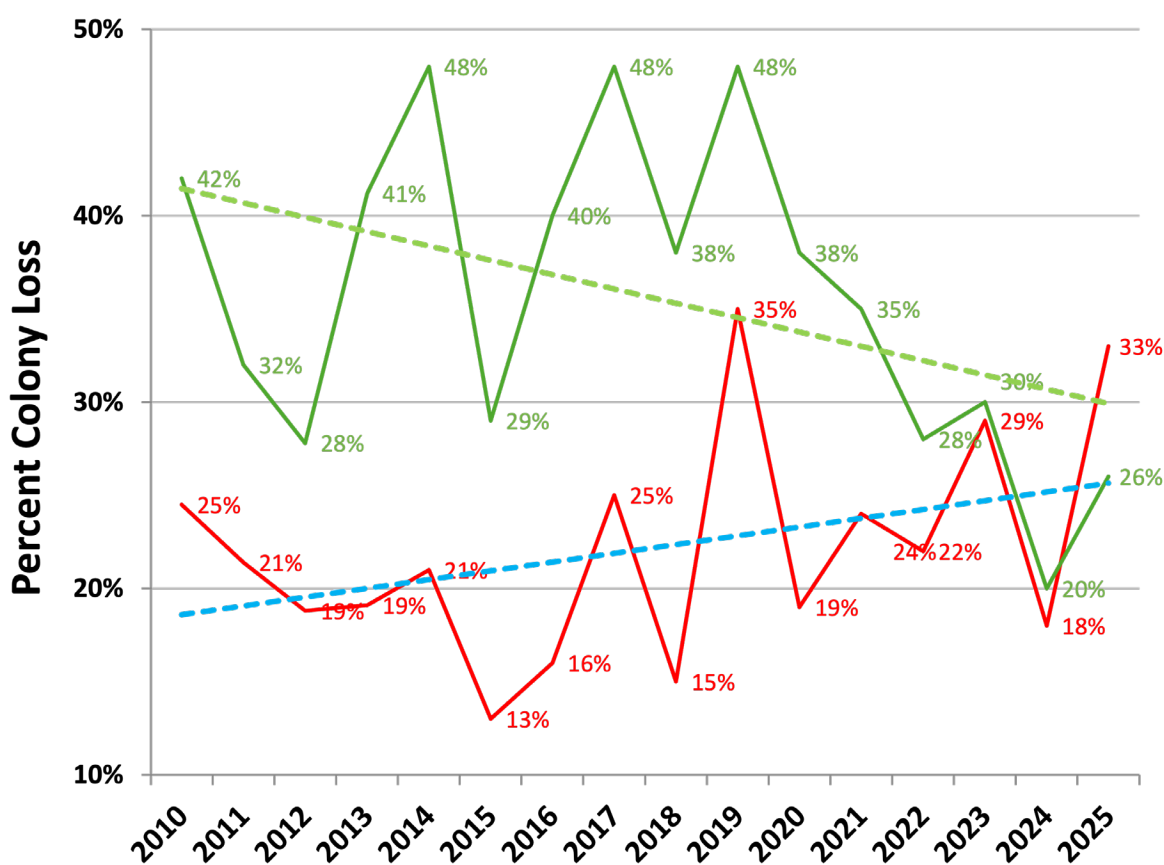


Figure 14: Annual survey of honey bee colony attrition in Oregon (2010–2025) collected by the OSU Honey Bee Lab. The graph distinguishes between two primary beekeeping sectors: the red solid line represents the annual losses reported by sideline and commercial beekeepers (managing 50 or more colonies), while the solid green lines represent losses reported by hobbyist beekeepers (managing fewer than 50 colonies). Trends are represented by the hashed blue (commercial beekeepers) and green (hobby beekeeper) lines. These data are utilized by the Oregon Bee Project to measure progress toward Strategic Plan Goal 3, specifically aiming to reduce the impact of bee diseases and pests through expanded diagnostic capacity and beekeeper education.

The Oregon Bee Atlas

The Oregon Bee Atlas is a specimen based community science program of the Oregon Bee Project, led by Oregon State University, developed to document, understand, and conserve Oregon’s wild bee diversity. Through the nationally unique Master Melittologist Extension program, trained volunteers collect, curate, and document wild bees using standardized protocols that ensure taxonomic rigor and long term scientific value. By 2025, the Atlas had grown into the largest contemporary state bee inventory in North America, with volunteers producing more than 30,000 floral-associated and specimen based Oregon records in 2025, representing bees collected from over 700 flowering plant species. These efforts resulted in new state records, rediscoveries of lost species, and substantial refinements to species distributions and bee–plant associations across Oregon’s ecoregions. All Atlas specimens are verified by expert taxonomists, archived in the Oregon State Arthropod Collection, and increasingly supported by DNA barcoding to resolve cryptic diversity and improve species level resolution. Oregon Bee Atlas data underpin applied conservation tools such as the Melittoflora (Basman et al, 2025), which translates more than a hundred thousand bee–plant records into actionable habitat and restoration guidance for land managers and conservation practitioners. The Atlas also plays a critical surveillance role by monitoring exotic bees that pose risks to Oregon’s wild and managed pollinators. Together, the Oregon Bee Atlas provides an enduring scientific foundation for pollinator conservation while empowering Oregonians to actively steward wild bee biodiversity.

Oregon Bee Atlas Collection Methods

Bee specimens included in the Oregon Bee Atlas are collected primarily by trained Master Melittologist volunteers using **active aerial netting (Figure 15)**, following standardized protocols developed by the Oregon Bee Atlas and described in detail in Best et al. (2021, 2022). Volunteers participate in online and in-person training covering bee biology, insect collection, specimen preparation, and data entry before contributing specimens.

Sampling is conducted using **variable-length transect netting**, with most collections occurring through free, undirected sampling aimed at maximizing species detection across habitats. Bees are collected within a 1-ha sampling unit, and all specimens captured by a collector from a single plant species within that unit, on a given date and time, are assigned a single sample identifier. When bees are collected directly from flowers, plant hosts are recorded on iNaturalist and added to the “Oregon Bee Atlas (Plant Images/SampleID)” project. A small number of volunteers venturing into remote, sparsely populated regions of the state deploy vane and pan-traps. This increases the productivity of those efforts and trapped specimens are data captured and labeled following similar procedures as the aerially-netted specimens. The data summaries in this report are based on 180,155 digitized specimen-based occurrence records. 144,239 specimens are from aerial netting. 133,039 specimens have associated floral records, and 11,200 without. An additional 25,592



Figure 15: A Master Melittologist employs an aerial net to collect bees.

specimens are from vane-traps, and 10,199 specimens from pan-traps.

All bee occurrence records in the Atlas are specimen based, with identifications verified by expert taxonomists. Representative voucher specimens are archived in the Oregon State Arthropod Collection (OSAC), ensuring long-term reproducibility and taxonomic verification. Data use Darwin Core field headers and meet global biodiversity data standards.

Bee Species Richness Summaries

Bee species richness documented through the Oregon Bee Atlas is presented at the Level III Ecoregion scale (**Figure 17**). Interpretation of statewide patterns in bee richness and distribution must be made with several caveats in mind. Sampling effort across Oregon is spatially uneven, reflecting the volunteer-based nature of the program. Regions with higher volunteer density or repeated sampling exhibit higher observed species richness (**Figure 16**), while less-sampled regions retain substantial gaps between observed and estimated richness (**Figures 17 & 21**). Sampling effort and observed species richness show a strong but nonlinear relationship across volunteers, counties, and ecoregions. Species accumulation increases rapidly with initial sampling effort and begins to level off as effort intensifies, indicating diminishing returns within well-sampled contexts. Patterns at the ecoregion scale show that regions with higher plant richness and broader sampling consistently support higher bee diversity (**Table 2**).

Taxonomic completeness varies substantially among bee families and genera (**Figures 18 & 19**). While some families and genera (e.g., Apidae, *Ceratina*) show relatively high proportions of specimens identified to species, others such as Colletidae and the cleptoparasitic bee genera *Nomada*, *Stelis*, and *Sphecodes* remain dominated by genus-level determinations. These patterns reflect intrinsic taxonomic complexity, uneven availability of regional identification resources, and biased curatorial effort.

Species richness estimates presented here are extrapolations rather than exhaustive inventories. Differences between observed and estimated richness highlight priority regions and taxa for additional sampling and taxonomic effort. These results emphasize the value of continued volunteer engagement and habitat-diverse sampling to more fully characterize Oregon's bee fauna.



Figure 16: Master Melittologists actively sampling bees at a location in the Northern Basin and Range ecoregion, which presents a high level of bee species richness.

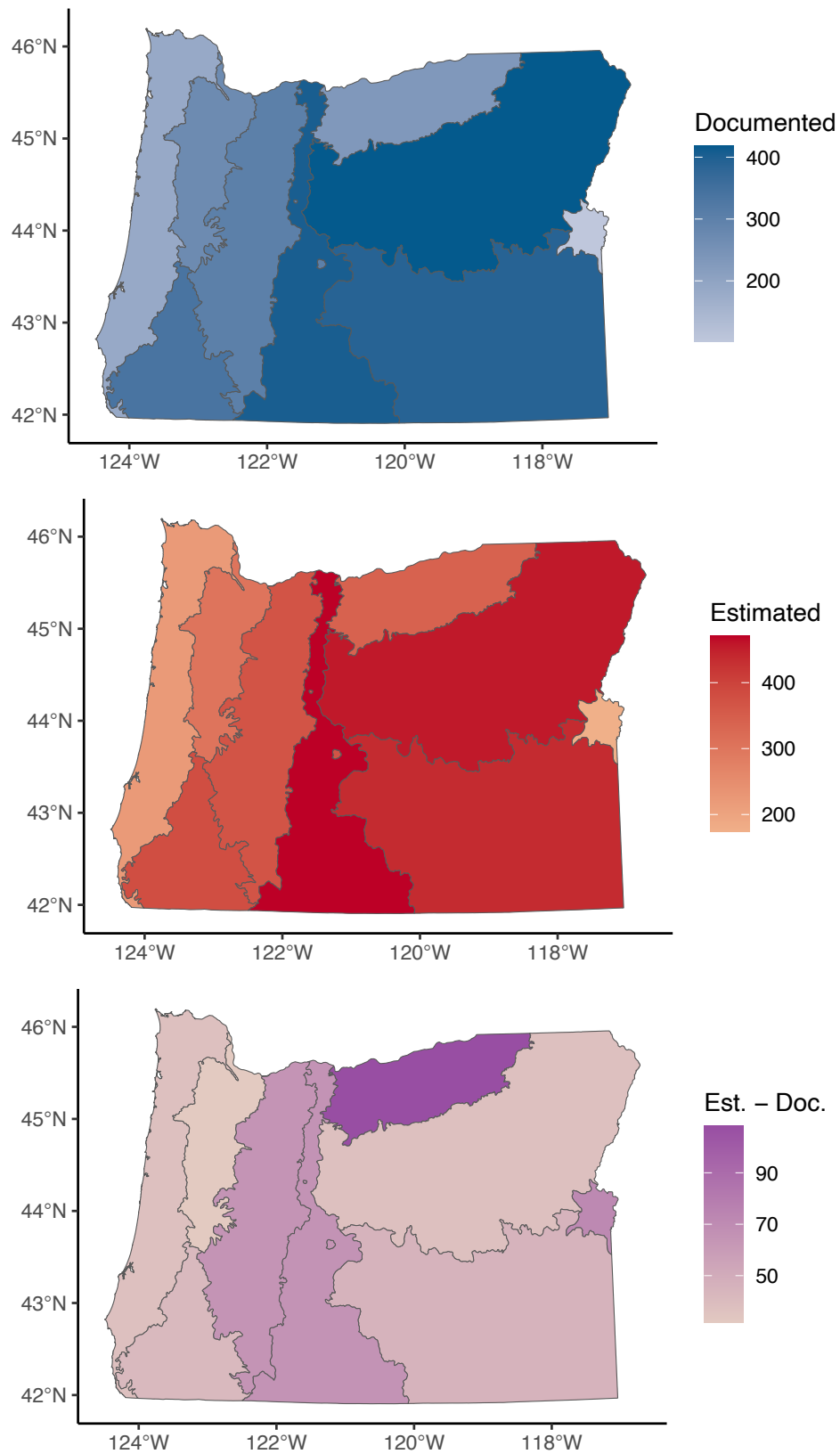


Figure 17: Bee species richness of level III ecoregions in Oregon. Top: number of bee species documented, Middle: estimated number of bee species present based on curated specimens, Bottom: the difference between estimated and documented bee species richness.

Tracking Specimen Identification Progress

Taxonomic completeness of the Oregon Bee Atlas dataset varies by family and has changed through time (**Figure 18**). Across years, identification rates to species are highest for Apidae and Halictidae, while Andrenidae and Colletidae remain disproportionately represented by genus-level records.

Patterns at the genus level further illustrate uneven taxonomic resolution across the fauna (**Figure 19**). Some genera approach complete species-level identification, while others remain largely unresolved due to high species richness and/or limited diagnostic resources.

These trends underscore the importance of sustained expert taxonomic involvement and continued development of regional identification tools to improve species-level resolution in future Atlas outputs.

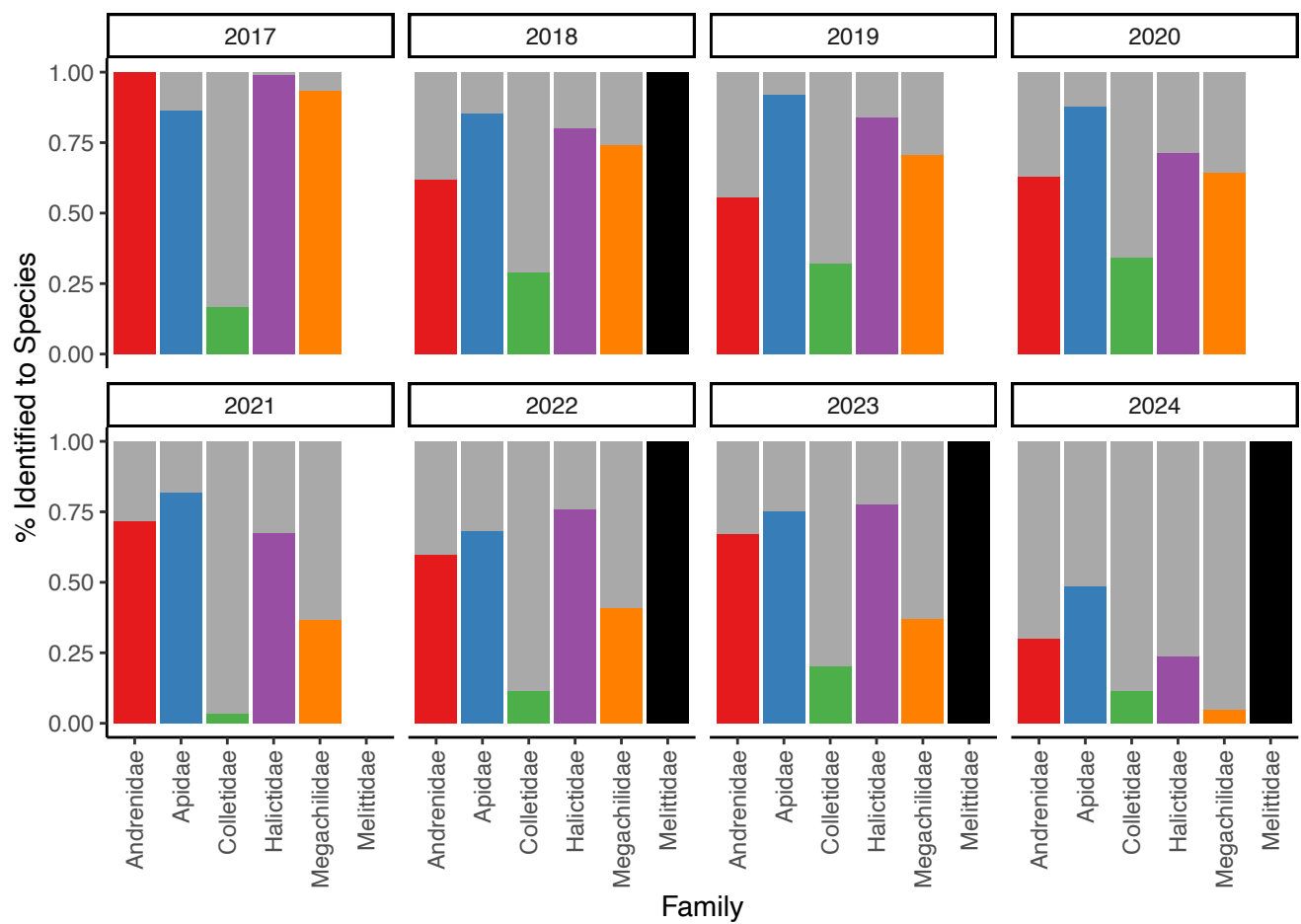


Figure 18: Proportion of specimens identified to species within each bee family by collection year.

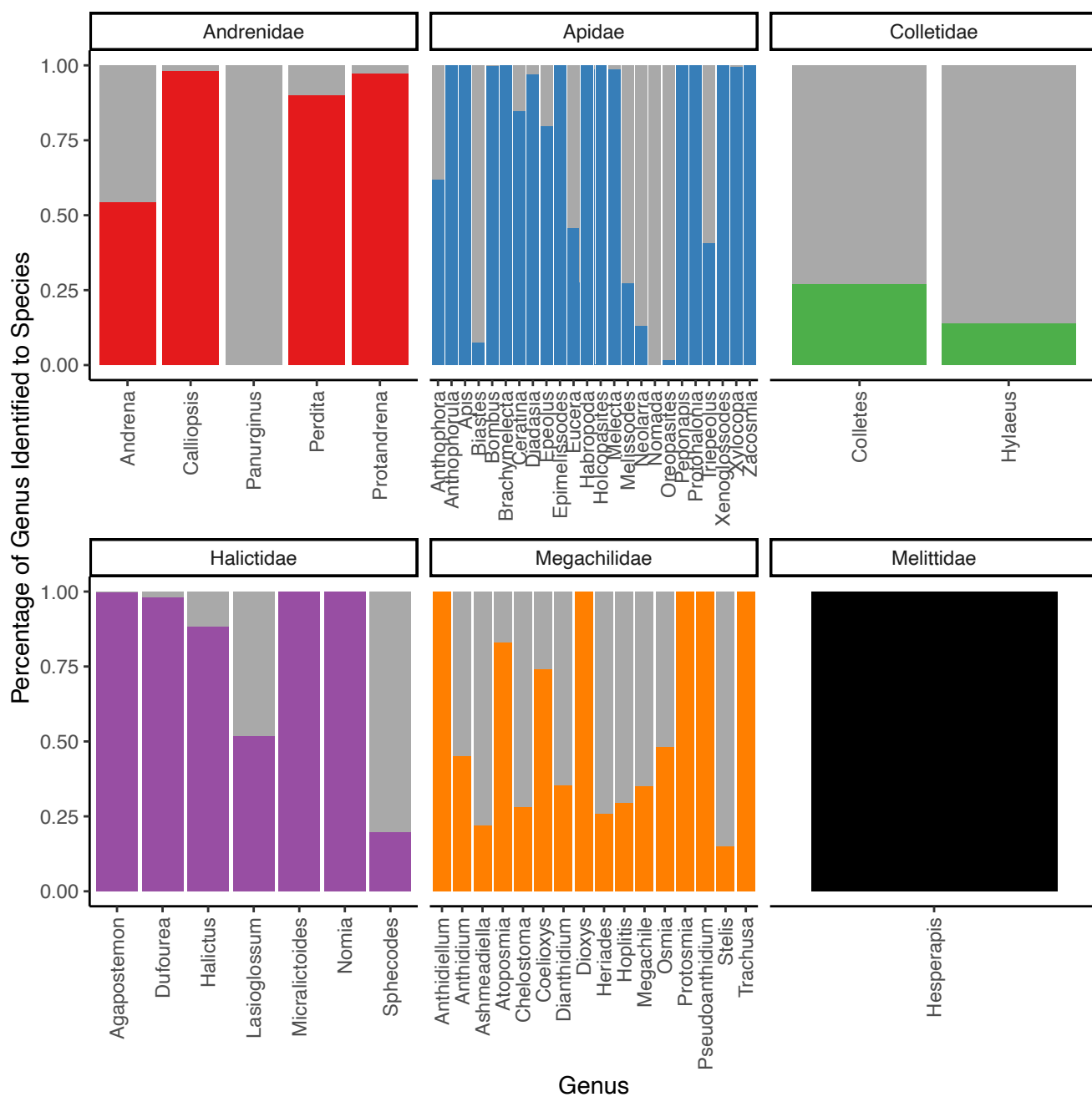


Figure 19: Proportion of bee specimens identified to species within each bee family, by genus.

Oregon Bee Atlas State Taxa List

The State Taxa List summarizes all bee taxa currently documented in the Oregon Bee Atlas database, organized alphabetically by genus and species (**Table 2**). The list is not meant as a comprehensive species checklist for the state of Oregon. It does not include species or data published in historical literature, published from other projects, or publicly available data from iNaturalist or the Global Biodiversity Information Facility (GBIF). The list also omits many species and Barcode Index Numbers (BIN's) generated by the Oregon Bee Atlas DNA barcoding initiative (Best et al. 2026). The state taxa list includes 567 species. DNA barcoding results provide evidence for nearly 200 additional species not recognized in this list.

The list includes both species-level and genus-level identifications, reflecting ongoing taxonomic work. In the list, counts reflect the number of specimen-based observations available statewide. High numbers of genus-level records, particularly within *Andrena*, *Lasioglossum*, *Osmia*, and *Hylaeus*, indicate substantial potential for future increases in documented species richness as identifications progress (**Figure 20**).



Figure 20: *Andrena cheyennorum*, a specialist on *Symphoricarpos*, had not been recorded previously in Oregon. Though about half of the *Andrena* collected through the OBA remain at the genus level, more than 100 species have been identified, including many new state records.

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Agapostemon angelicus</i>	1	<i>Andrena cuneilabris</i>	29
<i>Agapostemon femoratus</i>	968	<i>Andrena cupreotincta</i>	30
<i>Agapostemon melliventris</i>	48	<i>Andrena cyanophila</i>	13
<i>Agapostemon spp.</i>	3	<i>Andrena edwardsi</i>	1
<i>Agapostemon subtilior</i>	1,446	<i>Andrena erythrogaster</i>	14
<i>Agapostemon virescens</i>	728	<i>Andrena evoluta</i>	219
<i>Andrena ablegata</i>	7	<i>Andrena forbesii</i>	9
<i>Andrena aculeata</i>	1	<i>Andrena frigida</i>	89
<i>Andrena amphibola</i>	190	<i>Andrena fuscicauda</i>	2
<i>Andrena angustitarsata</i>	1,126	<i>Andrena hemileuca</i>	171
<i>Andrena anisochlora</i>	114	<i>Andrena hippotes</i>	762
<i>Andrena annectens</i>	4	<i>Andrena hypoleuca</i>	2
<i>Andrena astragali</i>	51	<i>Andrena illinoiensis</i>	23
<i>Andrena auricoma</i>	198	<i>Andrena knuthiana</i>	58
<i>Andrena barbilabris</i>	1	<i>Andrena laminibucca</i>	2
<i>Andrena bendensis</i>	42	<i>Andrena lawrencei</i>	86
<i>Andrena birtwelli</i>	42	<i>Andrena macoupinensis</i>	46
<i>Andrena caerulea</i>	113	<i>Andrena medionitens</i>	9
<i>Andrena candida</i>	1,176	<i>Andrena melanochroa</i>	5
<i>Andrena candidiformis</i>	13	<i>Andrena merriami</i>	77
<i>Andrena ceanothifloris</i>	22	<i>Andrena microchlora</i>	22
<i>Andrena cerasifolii</i>	3	<i>Andrena milwaukeeensis</i>	3
<i>Andrena chapmanae</i>	1	<i>Andrena miranda</i>	11
<i>Andrena cheyennorum</i>	6	<i>Andrena miserabilis</i>	166
<i>Andrena chlorogaster</i>	15	<i>Andrena monogonoparia</i>	12
<i>Andrena chlorura</i>	76	<i>Andrena nevadensis</i>	2
<i>Andrena citrinihirta</i>	7	<i>Andrena nigrihirta</i>	50
<i>Andrena cleodora</i>	160	<i>Andrena nigrocaerulea</i>	309
<i>Andrena colletina</i>	124	<i>Andrena nivalis</i>	2
<i>Andrena columbiana</i>	37	<i>Andrena nothocalaidis</i>	60
<i>Andrena commoda</i>	2	<i>Andrena orthocarpus</i>	348
<i>Andrena crataegi</i>	260	<i>Andrena pallidifovea</i>	257
<i>Andrena cressonii</i>	64	<i>Andrena pensilis</i>	63

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Andrena perarmata</i>	18	<i>Anthidium atrifrons</i>	44
<i>Andrena perplexa</i>	122	<i>Anthidium atripes</i>	2
<i>Andrena piperi</i>	62	<i>Anthidium banningense</i>	43
<i>Andrena proluxa</i>	4	<i>Anthidium clypeodentatum</i>	3
<i>Andrena prunorum</i>	1,018	<i>Anthidium edwardsii</i>	1
<i>Andrena quintiliformis</i>	66	<i>Anthidium emarginatum</i>	12
<i>Andrena ribblei</i>	4	<i>Anthidium formosum</i>	2
<i>Andrena rufosignata</i>	16	<i>Anthidium illustre</i>	4
<i>Andrena saccata</i>	7	<i>Anthidium maculosum</i>	2
<i>Andrena salicifloris</i>	211	<i>Anthidium manicatum</i>	315
<i>Andrena schuhi</i>	11	<i>Anthidium mormonum</i>	82
<i>Andrena scurra</i>	202	<i>Anthidium oblongatum</i>	92
<i>Andrena scutellinitens</i>	179	<i>Anthidium palliventre</i>	32
<i>Andrena semipunctata</i>	60	<i>Anthidium placitum</i>	5
<i>Andrena sladeni</i>	5	<i>Anthidium spp.</i>	940
<i>Andrena spp.</i>	7,751	<i>Anthidium tenuiflorae</i>	14
<i>Andrena striatifrons</i>	148	<i>Anthidium utahense</i>	147
<i>Andrena subaustralis</i>	30	<i>Anthophora affabilis</i>	1
<i>Andrena submoesta</i>	16	<i>Anthophora albata</i>	19
<i>Andrena subtilis</i>	39	<i>Anthophora bomboides</i>	71
<i>Andrena sulcata</i>	59	<i>Anthophora californica</i>	18
<i>Andrena surda</i>	15	<i>Anthophora crotchii</i>	69
<i>Andrena thaspiae</i>	28	<i>Anthophora curta</i>	25
<i>Andrena topazana</i>	16	<i>Anthophora edwardsii</i>	2
<i>Andrena transnigra</i>	4	<i>Anthophora exigua</i>	156
<i>Andrena trevoris</i>	28	<i>Anthophora maculifrons</i>	119
<i>Andrena vicina</i>	22	<i>Anthophora pacifica</i>	217
<i>Andrena vicinaoides</i>	56	<i>Anthophora peritomae</i>	2
<i>Andrena vierecki</i>	30	<i>Anthophora porterae</i>	10
<i>Andrena vulpicolor</i>	5	<i>Anthophora spp.</i>	1,609
<i>Andrena w-scripta</i>	1	<i>Anthophora terminalis</i>	103
<i>Andrena walleyi</i>	2	<i>Anthophora urbana</i>	1,928
<i>Andrena washingtoni</i>	20	<i>Anthophora ursina</i>	65
<i>Andrena wheeleri</i>	1	<i>Anthophorula chionura</i>	39
<i>Anthidiellum notatum</i>	218	<i>Apis mellifera</i>	1,745

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Ashmeadiella altadenae</i>	4	<i>Bombus nevadensis</i>	668
<i>Ashmeadiella aridula</i>	2	<i>Bombus occidentalis</i>	99
<i>Ashmeadiella bucconis</i>	78	<i>Bombus rufocinctus</i>	894
<i>Ashmeadiella cactorum</i>	12	<i>Bombus sitkensis</i>	385
<i>Ashmeadiella californica</i>	108	<i>Bombus</i> spp.	40
<i>Ashmeadiella cubiceps</i>	31	<i>Bombus sylvicola</i>	92
<i>Ashmeadiella difugita</i>	32	<i>Bombus vagans</i>	37
<i>Ashmeadiella foveata</i>	1	<i>Bombus vancouverensis</i>	3,523
<i>Ashmeadiella fozzella</i>	30	<i>Bombus vandykei</i>	655
<i>Ashmeadiella meliloti</i>	1	<i>Bombus vosnesenskii</i>	12,757
<i>Ashmeadiella sculleni</i>	1	<i>Brachymelecta californica</i>	839
<i>Ashmeadiella</i> spp.	1,131	<i>Calliopsis anthidius</i>	18
<i>Ashmeadiella timberlakei</i>	26	<i>Calliopsis coloradensis</i>	13
<i>Atoposmia abjecta</i>	87	<i>Calliopsis edwardsii</i>	452
<i>Atoposmia anthodyta</i>	23	<i>Calliopsis fracta</i>	41
<i>Atoposmia copelandica</i>	99	<i>Calliopsis hesperia</i>	33
<i>Atoposmia elongata</i>	145	<i>Calliopsis micheneri</i>	1
<i>Atoposmia oregona</i>	18	<i>Calliopsis obscurella</i>	33
<i>Atoposmia</i> spp.	79	<i>Calliopsis personata</i>	101
<i>Atoposmia triodonta</i>	19	<i>Calliopsis puellae</i>	20
<i>Biaestes fulviventris</i>	3	<i>Calliopsis scitula</i>	8
<i>Biaestes</i> spp.	36	<i>Calliopsis scutellaris</i>	244
<i>Bombus appositus</i>	819	<i>Calliopsis solitaria</i>	3
<i>Bombus caliginosus</i>	838	<i>Calliopsis</i> spp.	19
<i>Bombus centralis</i>	986	<i>Calliopsis xenus</i>	20
<i>Bombus fervidus</i>	3,976	<i>Ceratina acantha</i>	5,883
<i>Bombus flavidus</i>	580	<i>Ceratina arizonensis</i>	17
<i>Bombus flavifrons</i>	1,724	<i>Ceratina dallatorreana</i>	1
<i>Bombus griseocollis</i>	1,139	<i>Ceratina micheneri</i>	566
<i>Bombus huntii</i>	1,031	<i>Ceratina nanula</i>	462
<i>Bombus impatiens</i>	1	<i>Ceratina neomexicana</i>	121
<i>Bombus insularis</i>	318	<i>Ceratina pacifica</i>	258
<i>Bombus melanopygus</i>	1,039	<i>Ceratina sequoiae</i>	53
<i>Bombus mixtus</i>	4,449	<i>Ceratina</i> spp.	1,357
<i>Bombus morrisoni</i>	79	<i>Ceratina tejonensis</i>	171

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Chelostoma californicum</i>	3	<i>Diadasia consociata</i>	106
<i>Chelostoma minutum</i>	21	<i>Diadasia diminuta</i>	248
<i>Chelostoma phaceliae</i>	73	<i>Diadasia enavata</i>	288
<i>Chelostoma spp.</i>	241	<i>Diadasia lutzi</i>	83
<i>Coelioxys alternatus</i>	6	<i>Diadasia nigrifrons</i>	250
<i>Coelioxys apacheorum</i>	21	<i>Diadasia nitidifrons</i>	30
<i>Coelioxys banksi</i>	1	<i>Diadasia ochracea</i>	2
<i>Coelioxys deani</i>	19	<i>Diadasia spp.</i>	35
<i>Coelioxys edita</i>	48	<i>Dianthidium curvatum</i>	33
<i>Coelioxys erysimi</i>	10	<i>Dianthidium dubium</i>	32
<i>Coelioxys funerarius</i>	1	<i>Dianthidium heterulkei</i>	14
<i>Coelioxys grindeliae</i>	46	<i>Dianthidium parvum</i>	23
<i>Coelioxys hirsutissimus</i>	4	<i>Dianthidium platyurum</i>	4
<i>Coelioxys moestus</i>	18	<i>Dianthidium plenum</i>	3
<i>Coelioxys novomexicanus</i>	12	<i>Dianthidium pudicum</i>	97
<i>Coelioxys octodentatus</i>	40	<i>Dianthidium singulare</i>	1
<i>Coelioxys porterae</i>	8	<i>Dianthidium spp.</i>	880
<i>Coelioxys rufitarsis</i>	107	<i>Dianthidium subparvum</i>	127
<i>Coelioxys serricaudatus</i>	9	<i>Dianthidium ulkei</i>	152
<i>Coelioxys sodalis</i>	19	<i>Dioxys aurifuscus</i>	3
<i>Coelioxys spp.</i>	126	<i>Dioxys pacificus</i>	20
<i>Colletes compactus</i>	156	<i>Dioxys pomonae</i>	52
<i>Colletes consors</i>	40	<i>Dioxys productus</i>	11
<i>Colletes fulgidus</i>	341	<i>Dufourea afasciata</i>	4
<i>Colletes gypsicolens</i>	440	<i>Dufourea bernardina</i>	13
<i>Colletes kincaidii</i>	5	<i>Dufourea calochorti</i>	220
<i>Colletes lutzi</i>	4	<i>Dufourea campanulae</i>	19
<i>Colletes nigrifrons</i>	36	<i>Dufourea fimbriata</i>	6
<i>Colletes phaceliae</i>	17	<i>Dufourea holocyanea</i>	67
<i>Colletes simulans</i>	13	<i>Dufourea sandhouseae</i>	26
<i>Colletes slevini</i>	2	<i>Dufourea scabricornis</i>	31
<i>Colletes spp.</i>	2,600	<i>Dufourea spp.</i>	11
<i>Diadasia angusticeps</i>	21	<i>Dufourea trochantera</i>	227
<i>Diadasia australis</i>	75	<i>Epeolus americanus</i>	5
<i>Diadasia bituberculata</i>	86	<i>Epeolus compactus</i>	43

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Epeolus minimus</i>	5	<i>Hoplitis boharti</i>	23
<i>Epeolus novomexicanus</i>	12	<i>Hoplitis emarginata</i>	36
<i>Epeolus olympiellus</i>	77	<i>Hoplitis fulgida</i>	172
<i>Epeolus spp.</i>	34	<i>Hoplitis grinnelli</i>	53
<i>Epimelissodes obliquus</i>	36	<i>Hoplitis hypocrita</i>	86
<i>Eucera acerba</i>	75	<i>Hoplitis louisae</i>	27
<i>Eucera actiosa</i>	205	<i>Hoplitis orthognatha</i>	10
<i>Eucera amsinckiae</i>	14	<i>Hoplitis paiute</i>	1
<i>Eucera cordleyi</i>	156	<i>Hoplitis plagiostoma</i>	2
<i>Eucera edwardsii</i>	190	<i>Hoplitis producta</i>	105
<i>Eucera frater</i>	266	<i>Hoplitis remotula</i>	9
<i>Eucera fulvitaris</i>	7	<i>Hoplitis sambuci</i>	56
<i>Eucera lunata</i>	23	<i>Hoplitis spp.</i>	1,650
<i>Eucera spp.</i>	1,133	<i>Hoplitis uvulalis</i>	8
<i>Eucera virgata</i>	29	<i>Hoplitis viridimicans</i>	5
<i>Habropoda cineraria</i>	43	<i>Hylaeus annulatus</i>	18
<i>Habropoda dammersi</i>	83	<i>Hylaeus basalis</i>	182
<i>Habropoda depressa</i>	24	<i>Hylaeus mesillae</i>	414
<i>Habropoda miserabilis</i>	32	<i>Hylaeus modestus</i>	2
<i>Habropoda spp.</i>	529	<i>Hylaeus nunenmacheri</i>	47
<i>Habropoda tristissima</i>	29	<i>Hylaeus spp.</i>	3,899
<i>Halictus confusus</i>	733	<i>Lasioglossum aberrans</i>	65
<i>Halictus farinosus</i>	2,139	<i>Lasioglossum abundipunctum</i>	2
<i>Halictus ligatus</i>	5,624	<i>Lasioglossum albipenne</i>	10
<i>Halictus rubicundus</i>	1,372	<i>Lasioglossum albohirtum</i>	142
<i>Halictus spp.</i>	1,999	<i>Lasioglossum allonotum</i>	99
<i>Halictus tripartitus</i>	5,247	<i>Lasioglossum anhypops</i>	161
<i>Halictus virgatellus</i>	422	<i>Lasioglossum argemonis</i>	286
<i>Heriades carinata</i>	134	<i>Lasioglossum aspilurum</i>	59
<i>Heriades cressoni</i>	42	<i>Lasioglossum boreale</i>	66
<i>Heriades spp.</i>	506	<i>Lasioglossum brunneiventre</i>	89
<i>Heriades variolosa</i>	3	<i>Lasioglossum buccale</i>	47
<i>Hesperapis carinata</i>	18	<i>Lasioglossum californicum</i>	1
<i>Holcopasites pulchellus</i>	5	<i>Lasioglossum cembrilacus</i>	3
<i>Hoplitis albifrons</i>	106	<i>Lasioglossum colatum</i>	13

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Lasioglossum cooleyi</i>	321	<i>Lasioglossum pruinosum</i>	62
<i>Lasioglossum cordleyi</i>	415	<i>Lasioglossum pulveris</i>	655
<i>Lasioglossum cressonii</i>	465	<i>Lasioglossum punctatoventre</i>	18
<i>Lasioglossum dashwoodi</i>	10	<i>Lasioglossum quebecense</i>	22
<i>Lasioglossum diatretum</i>	381	<i>Lasioglossum robustum</i>	81
<i>Lasioglossum diversopunctatum</i>	51	<i>Lasioglossum ruidosense</i>	320
<i>Lasioglossum ebmerellum</i>	27	<i>Lasioglossum sandhousiellum</i>	24
<i>Lasioglossum egregium</i>	50	<i>Lasioglossum sedi</i>	10
<i>Lasioglossum engleri_MS</i>	3	<i>Lasioglossum sequoiae</i>	14
<i>Lasioglossum glabriventre</i>	185	<i>Lasioglossum sisymbrii</i>	475
<i>Lasioglossum helianthi</i>	463	<i>Lasioglossum spp.</i>	10,324
<i>Lasioglossum hudsoniellum</i>	39	<i>Lasioglossum tegulariforme</i>	19
<i>Lasioglossum hyalinum</i>	5	<i>Lasioglossum tenax</i>	8
<i>Lasioglossum incompletum</i>	539	<i>Lasioglossum testaceum</i>	2
<i>Lasioglossum inconditum</i>	410	<i>Lasioglossum titusi</i>	1,754
<i>Lasioglossum kincaidii</i>	207	<i>Lasioglossum trizonatum</i>	41
<i>Lasioglossum knereri</i>	22	<i>Lasioglossum tuolumnense</i>	36
<i>Lasioglossum laevissimum</i>	40	<i>Lasioglossum villosulum</i>	726
<i>Lasioglossum lusorium</i>	24	<i>Lasioglossum yukonae</i>	2
<i>Lasioglossum macoupinense</i>	8	<i>Lasioglossum zephyrus</i>	64
<i>Lasioglossum macroprosopum</i>	8	<i>Lasioglossum zonulum</i>	161
<i>Lasioglossum marinense</i>	10	<i>Megachile addenda</i>	7
<i>Lasioglossum megastictum</i>	2	<i>Megachile angelarum</i>	335
<i>Lasioglossum mellipes</i>	94	<i>Megachile anograe</i>	12
<i>Lasioglossum nevadense</i>	104	<i>Megachile apicalis</i>	140
<i>Lasioglossum nigrum</i>	159	<i>Megachile brevis</i>	42
<i>Lasioglossum novascotiae</i>	6	<i>Megachile centuncularis</i>	25
<i>Lasioglossum occultum</i>	401	<i>Megachile cleomis</i>	1
<i>Lasioglossum olympiae</i>	1,146	<i>Megachile coquilletti</i>	12
<i>Lasioglossum orthocarp</i>	25	<i>Megachile fidelis</i>	132
<i>Lasioglossum ovaliceps</i>	72	<i>Megachile frigida</i>	15
<i>Lasioglossum pacatum</i>	16	<i>Megachile gemula</i>	16
<i>Lasioglossum pacificum</i>	225	<i>Megachile gentilis</i>	16
<i>Lasioglossum pavonotum</i>	78	<i>Megachile gravita</i>	61
<i>Lasioglossum prasinogaster</i>	12	<i>Megachile inermis</i>	6

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Megachile inimica</i>	2	<i>Melissodes rivalis</i>	46
<i>Megachile lapponica</i>	25	<i>Melissodes robustior</i>	110
<i>Megachile lippiae</i>	3	<i>Melissodes semilupinus</i>	16
<i>Megachile melanophaea</i>	50	<i>Melissodes spp.</i>	4,800
<i>Megachile mellitarsis</i>	35	<i>Micralictoides linsleyi</i>	9
<i>Megachile montivaga</i>	25	<i>Micralictoides ruficaudus</i>	49
<i>Megachile nevadensis</i>	47	<i>Neolarra spp.</i>	40
<i>Megachile onobrychidis</i>	16	<i>Neolarra vandykei</i>	1
<i>Megachile parallela</i>	175	<i>Neolarra vigilans</i>	5
<i>Megachile perihirta</i>	434	<i>Nomada spp.</i>	3,285
<i>Megachile pseudonigra</i>	6	<i>Nomia melanderi</i>	16
<i>Megachile pugnata</i>	152	<i>Oreopasites spp.</i>	56
<i>Megachile relativa</i>	20	<i>Oreopasites vanduzeei</i>	1
<i>Megachile rotundata</i>	318	<i>Osmia aglaia</i>	34
<i>Megachile spp.</i>	3,992	<i>Osmia albolateralis</i>	17
<i>Megachile subnigra</i>	40	<i>Osmia atriventris</i>	1
<i>Megachile texana</i>	1	<i>Osmia atrocyanea</i>	458
<i>Megachile umatillensis</i>	4	<i>Osmia bella</i>	7
<i>Megachile wheeleri</i>	65	<i>Osmia brevis</i>	448
<i>Melecta edwardsii</i>	15	<i>Osmia bruneri</i>	174
<i>Melecta pacifica</i>	238	<i>Osmia bucephala</i>	43
<i>Melecta separata</i>	110	<i>Osmia caerulescens</i>	27
<i>Melecta spp.</i>	5	<i>Osmia californica</i>	670
<i>Melecta thoracica</i>	24	<i>Osmia calla</i>	283
<i>Melissodes agilis</i>	46	<i>Osmia cara</i>	14
<i>Melissodes bimatrix</i>	49	<i>Osmia cobaltina</i>	18
<i>Melissodes clarkiae</i>	30	<i>Osmia coloradensis</i>	388
<i>Melissodes communis</i>	11	<i>Osmia cornifrons</i>	207
<i>Melissodes dagosus</i>	5	<i>Osmia cyanella</i>	401
<i>Melissodes lupinus</i>	1,031	<i>Osmia cyaneonitens</i>	1
<i>Melissodes lustrus</i>	6	<i>Osmia densa</i>	628
<i>Melissodes menuachus</i>	3	<i>Osmia dolerosa</i>	6
<i>Melissodes metenus</i>	97	<i>Osmia ednae</i>	104
<i>Melissodes microstictus</i>	494	<i>Osmia enixa</i>	6
<i>Melissodes pallidesignatus</i>	15	<i>Osmia exigua</i>	98

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Osmia gabrielis</i>	35	<i>Osmia sculleni</i>	59
<i>Osmia gaudiosa</i>	12	<i>Osmia similima</i>	26
<i>Osmia giliarum</i>	2	<i>Osmia spp.</i>	9,762
<i>Osmia glauca</i>	34	<i>Osmia subaustralis</i>	93
<i>Osmia grinnelli</i>	34	<i>Osmia tanneri</i>	1
<i>Osmia inermis</i>	5	<i>Osmia tarsata</i>	1
<i>Osmia integra</i>	220	<i>Osmia tersula</i>	2
<i>Osmia inurbana</i>	3	<i>Osmia texana</i>	92
<i>Osmia juxta</i>	206	<i>Osmia thysanisca</i>	5
<i>Osmia kincaidii</i>	336	<i>Osmia trevoris</i>	2
<i>Osmia laeta</i>	22	<i>Osmia tristella</i>	237
<i>Osmia lanei</i>	57	<i>Osmia unca</i>	76
<i>Osmia lignaria</i>	636	<i>Osmia vandykei</i>	46
<i>Osmia longula</i>	36	<i>Panurginus atriceps</i>	1
<i>Osmia malina</i>	11	<i>Panurginus spp.</i>	1,981
<i>Osmia marginipennis</i>	2	<i>Peponapis pruinosa</i>	31
<i>Osmia melanopleura</i>	11	<i>Perdita adjuncta</i>	42
<i>Osmia montana</i>	891	<i>Perdita aemula</i>	229
<i>Osmia nanula</i>	2	<i>Perdita albipennis</i>	144
<i>Osmia nemoris</i>	740	<i>Perdita ciliata</i>	30
<i>Osmia nifoata</i>	3	<i>Perdita claypolei</i>	332
<i>Osmia nigrifrons</i>	46	<i>Perdita distincta</i>	71
<i>Osmia obliqua</i>	7	<i>Perdita heliophila</i>	19
<i>Osmia odontogaster</i>	4	<i>Perdita hirticeps</i>	31
<i>Osmia paradisica</i>	1	<i>Perdita interrupta</i>	44
<i>Osmia pentstemonis</i>	248	<i>Perdita lepidosparti</i>	94
<i>Osmia physariae</i>	1	<i>Perdita nevadensis</i>	232
<i>Osmia pikei</i>	28	<i>Perdita nuttalliae</i>	20
<i>Osmia proxima</i>	28	<i>Perdita oregonensis</i>	494
<i>Osmia pusilla</i>	414	<i>Perdita phymatae</i>	191
<i>Osmia raritatis</i>	6	<i>Perdita salicis</i>	132
<i>Osmia rawlinsi</i>	78	<i>Perdita similis</i>	49
<i>Osmia regulina</i>	248	<i>Perdita spp.</i>	339
<i>Osmia ribifloris</i>	117	<i>Perdita subfasciata</i>	56
<i>Osmia sanrafaelae</i>	1	<i>Perdita swezeyi</i>	33

Table 2: Oregon Bee Atlas Taxa List.

Species	Obs.	Species (Cont.)	Obs. (Cont.)
<i>Perdita transversa</i>	9	<i>Triepeolus paenepectoralis</i>	80
<i>Perdita wyomingensis</i>	88	<i>Triepeolus punctoclypeus</i>	3
<i>Perdita zonalis</i>	776	<i>Triepeolus robustus</i>	1
<i>Protandrena californica</i>	1	<i>Triepeolus saturninus</i>	2
<i>Protandrena luxsolaris_MS</i>	63	<i>Triepeolus shoshone</i>	4
<i>Protandrena prata_MS</i>	3	<i>Triepeolus spp.</i>	347
<i>Protandrena renimaculata</i>	5	<i>Triepeolus texanus</i>	2
<i>Protandrena spp.</i>	2	<i>Triepeolus utahensis</i>	50
<i>Protohalonia venusta</i>	2	<i>Xenoglossodes pomonae</i>	29
<i>Protosmia rubifloris</i>	754	<i>Xylocopa californica</i>	25
<i>Pseudoanthidium nanum</i>	17	<i>Xylocopa spp.</i>	1
<i>Sphecodes arvensiformis</i>	98	<i>Xylocopa tabaniformis</i>	185
<i>Sphecodes davisii</i>	46	<i>Xylocopa virginica</i>	7
<i>Sphecodes kincaidii</i>	47	<i>Zacosmia maculata</i>	42
<i>Sphecodes olympicus</i>	2		
<i>Sphecodes pecosensis</i>	70		
<i>Sphecodes prosporus</i>	7		
<i>Sphecodes spp.</i>	1,084		
<i>Stelis ashmeadiellae</i>	2		
<i>Stelis carnifex</i>	2		
<i>Stelis laticincta</i>	40		
<i>Stelis montana</i>	2		
<i>Stelis monticola</i>	6		
<i>Stelis rubi</i>	1		
<i>Stelis spp.</i>	343		
<i>Stelis submarginata</i>	7		
<i>Trachusa timberlakei</i>	67		
<i>Triepeolus argus</i>	2		
<i>Triepeolus argyreus</i>	18		
<i>Triepeolus californicus</i>	2		
<i>Triepeolus concavus</i>	5		
<i>Triepeolus helianthi</i>	7		
<i>Triepeolus lunatus</i>	3		
<i>Triepeolus melanarius</i>	58		
<i>Triepeolus micropygius</i>	1		

Ecoregion Profiles

To understand the distribution of Oregon’s bee species and their floral preferences, there is a need to look beyond political boundaries and focus on regions defined by biogeographic conditions such as geology, vegetation, climate, and hydrology. The Environmental Protection Agency (EPA) Level III Ecoregions were developed to provide a more effective way to monitor and manage the health of the nation’s ecosystems than traditional political boundaries allow. Level III ecoregions within Oregon—such as the Willamette Valley, the Cascades, and the Blue Mountains—are intuitive to most Oregonians. While significant variability exists within each region, they represent meaningful distinctions for land managers. Although finer scales exist (e.g., EPA Level IV ecoregions), the Oregon Bee Atlas does not yet have the data density for most areas that would be required to provide reliable generalizations at that high level of resolution. As the Oregon Bee Atlas continues we anticipate future reports will provide more specific information at these finer scales.

This section provides a summary of the current bee and associated plant records for the Oregon Bee Atlas for each Level III ecoregion.

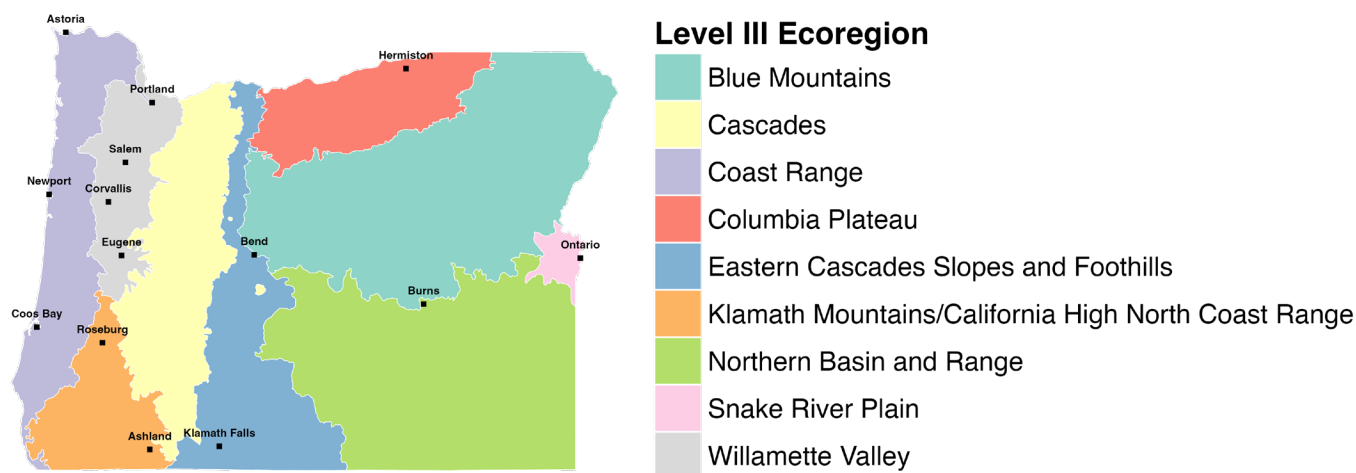


Figure 21: A color-coded map of the Level III Ecoregions in Oregon.

For each of the Ecoregions, the top plants for bee richness are presented, with figures showing the number of bee species and the number of bee visits recorded. These data are influenced by the collection biases of Master Melittologist volunteers and do not always reflect the inherent value of a particular plant. For example, mass blooming plant species like exotic blackberries can draw in (and support) large numbers of bees and therefore be an attractive collection target. While the high bee species richness found in association with some exotic plants is real, the relative importance of these plants may be skewed by a greater number of collections. However, it may be expected that some exotic plants are providing critical resources for bees in highly altered vegetation communities. Without further curation, these lists of top plants should not be interpreted as recommended planting lists, though these same data are being used to develop such lists.

Plants in these lists are coded as *native*, *exotic*, or *mixed* by interpreting origin at the genus level. This resulted in a few occasions of errors in the outputs where certain full species are listed as *mixed* due to the mixed status of their genus (e.g., *Cirsium peckii*, an endemic native thistle).

State Ecoregions - Summary

Table 3: Summary of bee species, plant hosts, specimen volume, and unique collectors by Ecoregion.

Ecoregion	Bee Species	Plant Species	Bees Collected	Collectors
Blue Mountains	418	582	31,094	78
Cascades	303	469	15,101	96
Coast Range	185	431	8,761	73
Columbia Plateau	233	293	8,891	62
Eastern Cascades Slopes and Foothills	405	597	24,625	91
Klamath Mountains	338	631	18,755	66
Northern Basin and Range	390	358	22,972	45
Snake River Plain	102	52	2,271	13
Willamette Valley	271	871	47,464	142

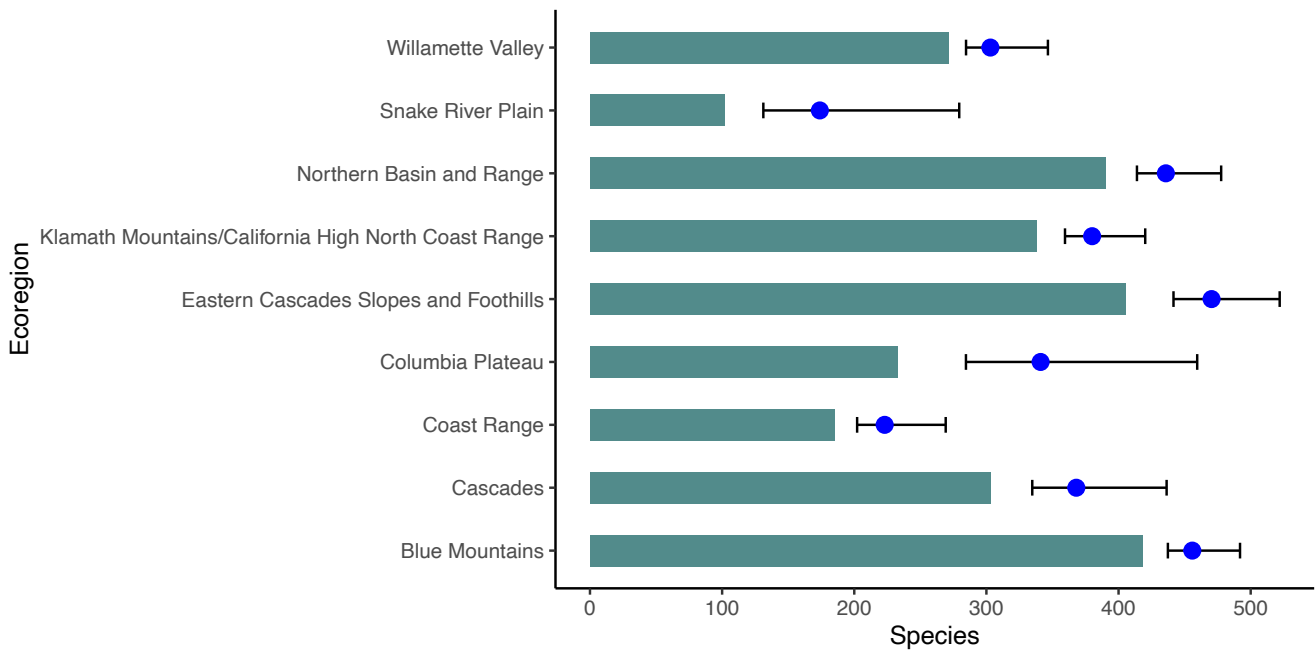


Figure 22: Bar chart of documented species richness for Level III Ecoregions in Oregon and estimates of species richness with a 95% confidence interval.

Blue Mountains Ecoregion

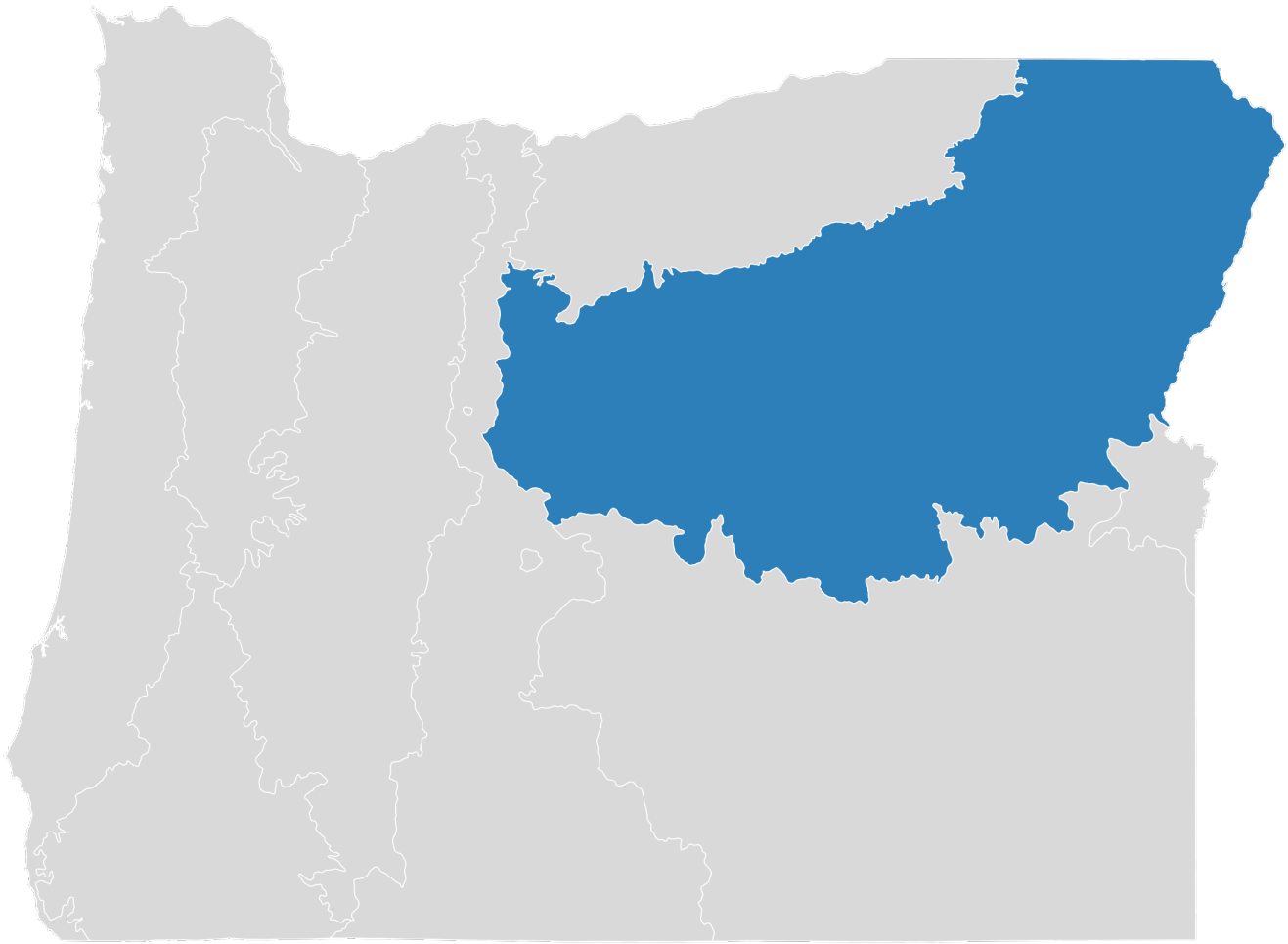


Figure 23: Level III Ecoregions of Oregon, with the Blue Mountains Ecoregion highlighted.

The Blue Mountains Ecoregion encompasses a large portion of northeastern Oregon and includes several prominent mountain ranges, as well as Hells Canyon, which is the deepest gorge in North America. The region is defined by a severe mid-latitude climate with warm, dry summers and cold, relatively dry winters. Temperature and precipitation are highly variable throughout the region, largely depending on elevation, with precipitation ranging from about 8 inches to 80 inches annually. Consequently, vegetation communities range from high desert shrubland and grasslands, to pine forests and alpine meadows. Much of the region is of volcanic origin, however intrusive and metamorphosed rocks can be found in some of the higher mountain ranges. This variability in climate and geology has shaped a biodiverse flora, which in turn hosts the greatest species richness of bees documented by the Oregon Bee Atlas thus far.

418

Bee Species
Recorded

581

Plant Species
Recorded

5920

Bee-Plant
Interactions



Ecoregion Summary Map

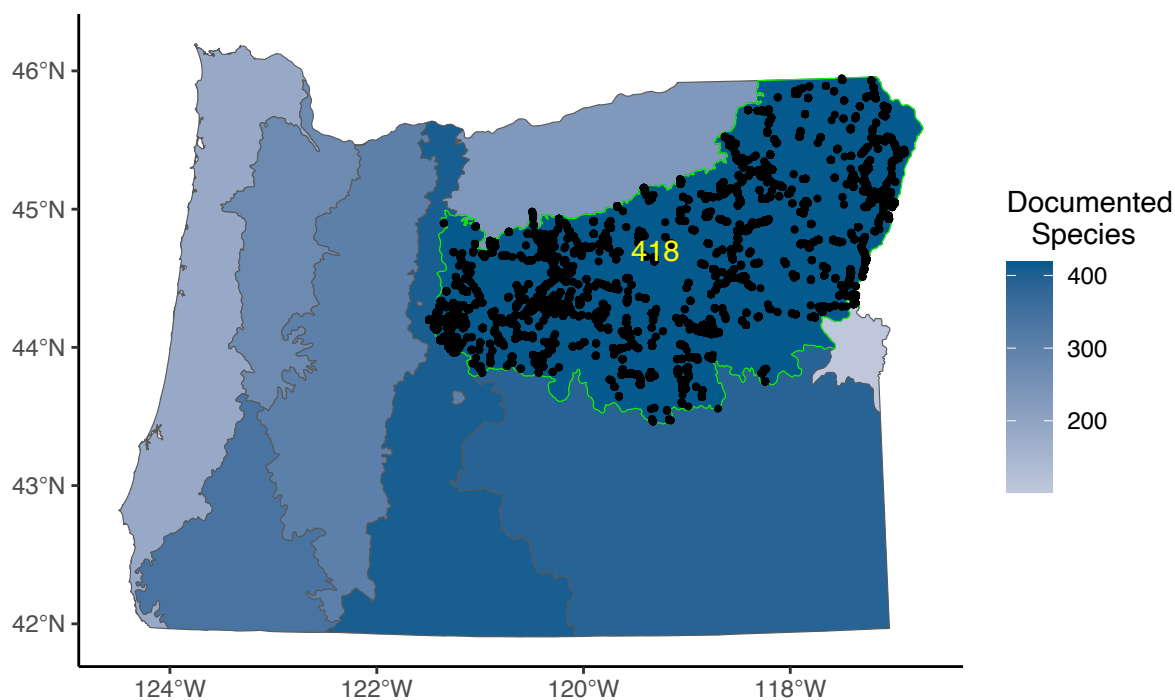


Figure 24: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Blue Mountains Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Blue Mountains Ecoregion.

Top Plants For Bee Richness

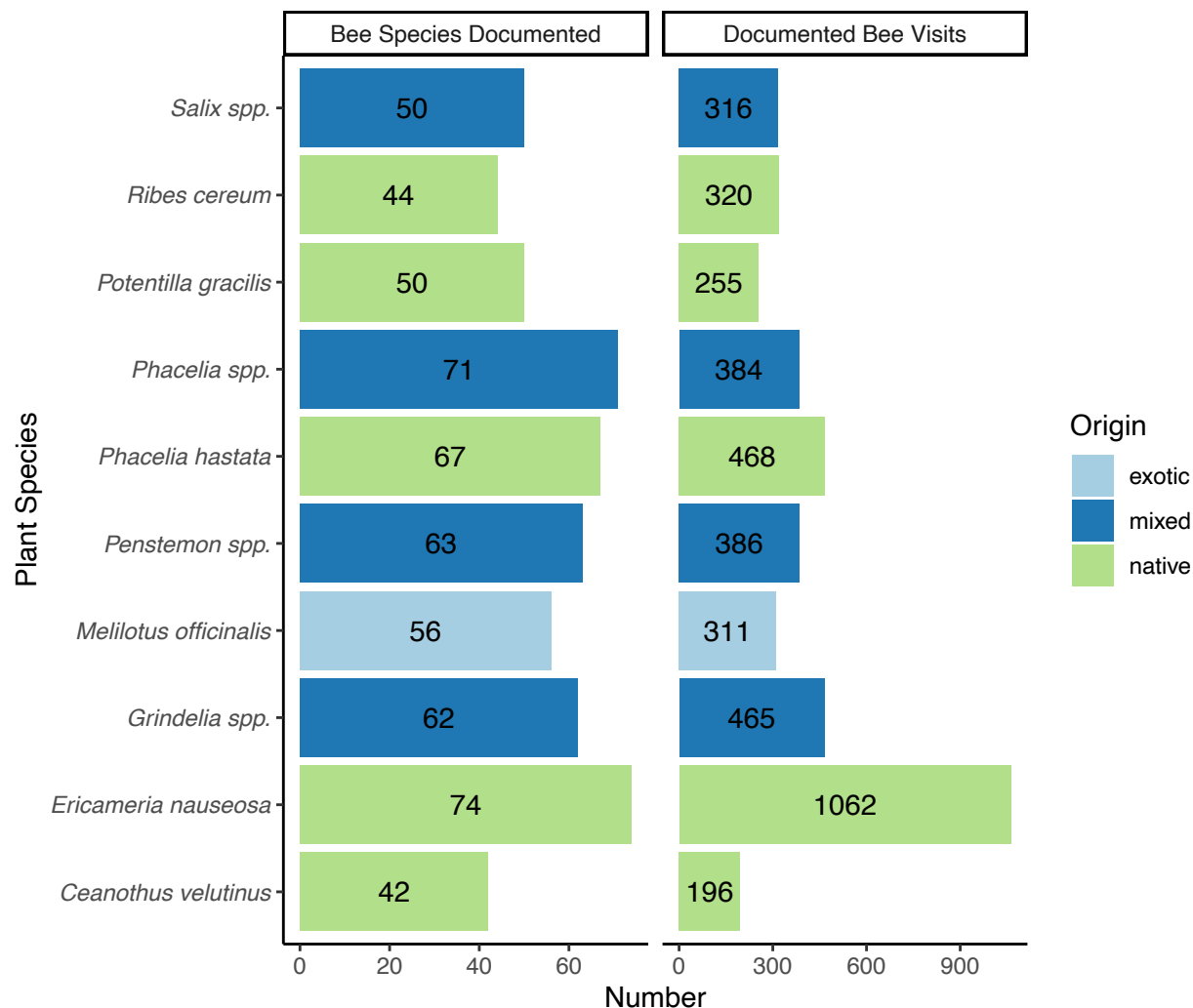


Figure 25: Top sampled plants for documented bee richness in the Blue Mountains Ecoregion.

Top plants for bee richness, split by season

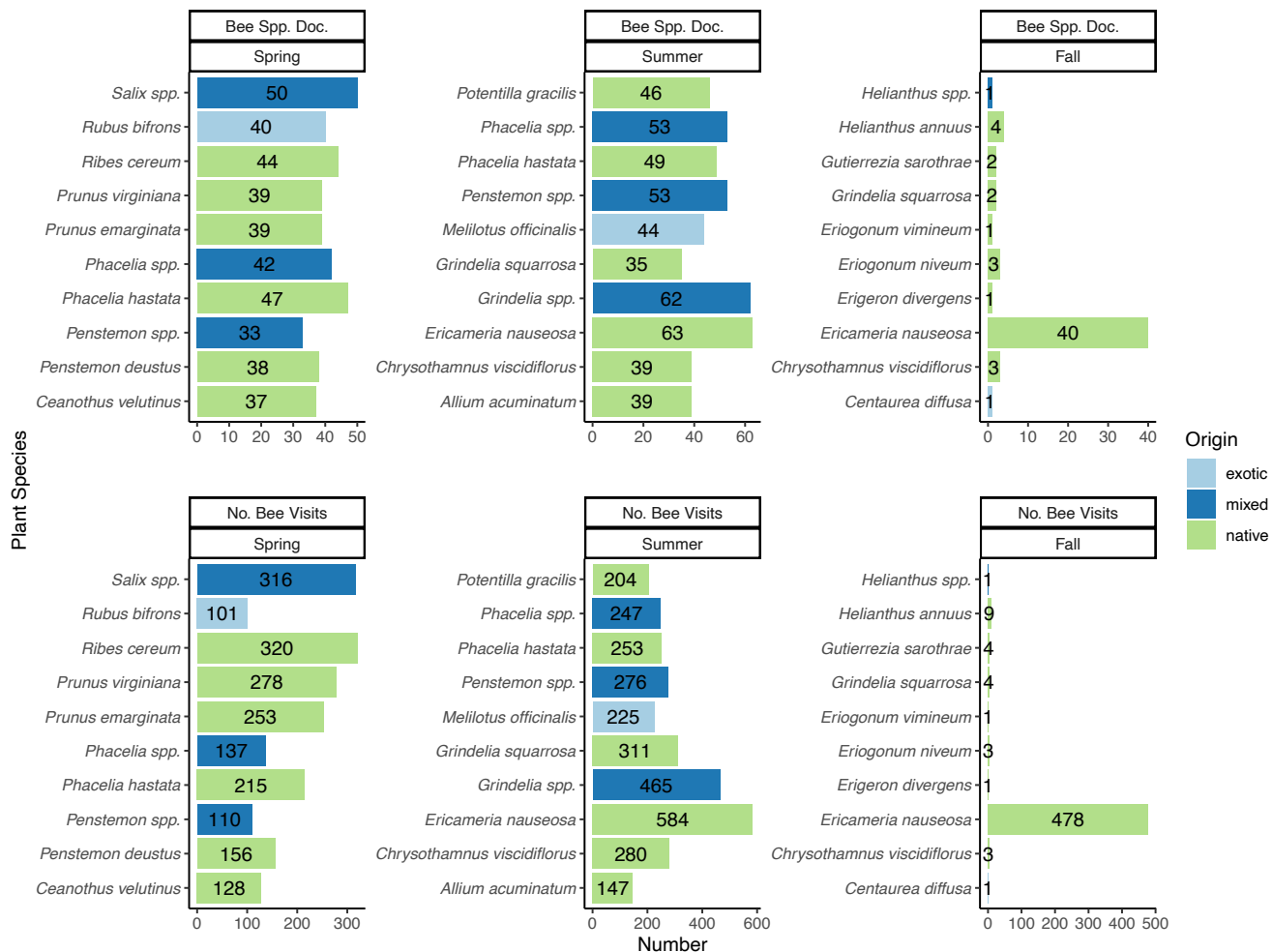


Figure 26: Top sampled plant species that support the most documented bee species by season in the Blue Mountains Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Blue Mountains ecoregion

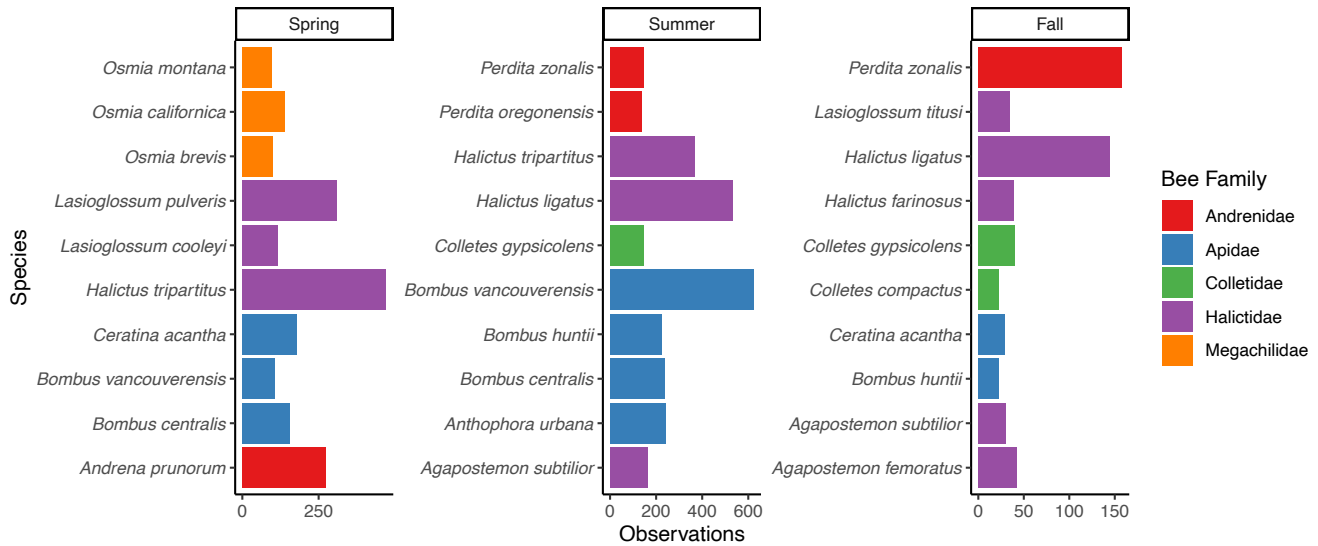


Figure 27: Most abundant bee species documented in the Blue Mountains Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Blue Mountains ecoregion

Table 4: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Blue Mountains Ecoregion.

Bee Species	Observations
<i>Andrena ablegata</i>	1
<i>Andrena aculeata</i>	1
<i>Andrena candidiformis</i>	5
<i>Andrena chapmanae</i>	1
<i>Andrena commoda</i>	1
<i>Andrena cyanophila</i>	4
<i>Andrena edwardsi</i>	1
<i>Andrena erythrogaster</i>	11
<i>Andrena forbesii</i>	5
<i>Andrena medionitens</i>	1
<i>Andrena melanochoa</i>	1
<i>Andrena miranda</i>	7
<i>Andrena nivalis</i>	2
<i>Andrena schuhi</i>	3
<i>Andrena wheeleri</i>	1

Table 4: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Blue Mountains Ecoregion.

Bee Species	Observations
<i>Anthidium atripes</i>	1
<i>Anthidium clypeodentatum</i>	2
<i>Anthidium placitum</i>	4
<i>Anthophora peritomae</i>	2
<i>Anthophora porterae</i>	8
<i>Coelioxys alternatus</i>	1
<i>Coelioxys banksi</i>	1
<i>Coelioxys erysimi</i>	2
<i>Coelioxys porterae</i>	2
<i>Colletes kincaidii</i>	1
<i>Colletes simulans</i>	2
<i>Colletes slevini</i>	2
<i>Dianthidium heterulkei</i>	1
<i>Dioxys productus</i>	2
<i>Epeolus americanus</i>	2
<i>Epeolus minimus</i>	2
<i>Epeolus novomexicanus</i>	4
<i>Eucera amsinckiae</i>	3
<i>Eucera fulvitaris</i>	1
<i>Holcopasites pulchellus</i>	5
<i>Hoplitis orthognatha</i>	10
<i>Lasioglossum albipenne</i>	1
<i>Lasioglossum colatum</i>	1
<i>Lasioglossum dashwoodi</i>	5
<i>Lasioglossum macoupinense</i>	2
<i>Lasioglossum sedi</i>	7
<i>Megachile addenda</i>	3
<i>Megachile coquilletti</i>	1
<i>Melissodes communis</i>	6
<i>Osmia bella</i>	3
<i>Osmia enixa</i>	1
<i>Osmia gaudiosa</i>	5
<i>Osmia giliarum</i>	1
<i>Osmia inermis</i>	1

Table 4: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Blue Mountains Ecoregion.

Bee Species	Observations
<i>Osmia malina</i>	1
<i>Osmia melanopleura</i>	3
<i>Osmia nifoata</i>	1
<i>Osmia paradisica</i>	1
<i>Osmia tersula</i>	1
<i>Osmia thysanisca</i>	1
<i>Sphecodes proshorus</i>	1
<i>Stelis ashmeadiellae</i>	1
<i>Stelis carnifex</i>	1
<i>Stelis monticola</i>	2
<i>Stelis rubi</i>	1
<i>Stelis submarginata</i>	1
<i>Triepeolus helianthi</i>	1
<i>Triepeolus punctoclypeus</i>	1
<i>Triepeolus saturninus</i>	1

Known specialist bee species present in the Blue Mountains ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena ablegata</i>	1	Agoseris Raf.
<i>Andrena astragali</i>	20	Zigadenus Michx. (Toxicoscordion Rydb.)
<i>Andrena bendensis</i>	4	Asteraceae: Ericameria Nutt.
<i>Andrena birtwelli</i>	7	Potentilla L.
<i>Andrena caerulea</i>	4	Ranunculus L.
<i>Andrena candidiformis</i>	5	Ceanothus L., Lomatium Raf.
<i>Andrena chapmanae</i>	1	Cryptantha Lehm. ex G. Don, Hackelia Opiz
<i>Andrena cleodora</i>	19	Ceanothus L.

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena colletina</i>	47	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Andrena columbiana</i>	5	Asteraceae: Heterotheca Cass., Solidago L.
<i>Andrena erythrogaster</i>	11	Salix L.
<i>Andrena evoluta</i>	35	Agoseris Raf.
<i>Andrena frigida</i>	13	Salix L.
<i>Andrena illinoiensis</i>	6	Salix L.
<i>Andrena macoupinensis</i>	25	Salix L.
<i>Andrena melanochoa</i>	1	Potentilla L.
<i>Andrena nothocalaidis</i>	13	Agoseris Raf.
<i>Andrena orthocarpus</i>	2	Lasthenia Cass.
<i>Andrena perarmata</i>	5	Salix L.
<i>Andrena piperi</i>	5	Brassicaceae: Descurainia Webb & Bethel., Lepidium L., Lesquerella S. Watson, Physaria (Nutt. ex Torr. & A. Gray) A. Gray
<i>Andrena salicifloris</i>	5	Salix L.
<i>Andrena scurra</i>	51	Brassicaceae: Lepidium L., Lesquerella S. Watson
<i>Andrena scutellinitens</i>	3	Asteraceae: Achillea L., Anaphalis DC., Eurybia (Cass.) Cass., Erigeron L., Senecio L., Solidago L.
<i>Andrena semipunctata</i>	18	Salix L.
<i>Andrena striatifrons</i>	55	Salix L.
<i>Andrena subaustralis</i>	3	Salix L.
<i>Andrena submoesta</i>	9	Lasthenia Cass.
<i>Andrena sulcata</i>	17	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt.
<i>Andrena surda</i>	1	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Machaeranthera Nees, Solidago L.
<i>Anthidium atripes</i>	1	Fabaceae: Astragalus L., Lotus L.
<i>Anthidium clypeodentatum</i>	2	Fabaceae: Astragalus L., Lotus L.
<i>Anthidium mormonum</i>	14	Lotus L., Phacelia Juss.
<i>Anthidium placitum</i>	4	Cordylanthus Nutt. ex Benth.
<i>Anthidium utahense</i>	14	Fabaceae: Lotus L.
<i>Anthophora exigua</i>	3	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Haplopappus Cass., Orochaenactis Coville
<i>Anthophora maculifrons</i>	33	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Vancleavea Greene

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Anthophora porterae</i>	8	Astragalus L.
<i>Ashmeadiella buconis</i>	21	Asteraceae: Acamptopappus (A. Gray) A. Gray, Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Chrysanthamnus Nutt., Coreopsis L., Echinacea Moench, Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Helianthus Nutt., Heterotheca Cass., Hymenoxys A. Gray, Isocoma Nutt., Lactuca L., Machaeranthera Nees, Pectis L., Pentstemon Nutt., Senecio L., Solidago L., Vancleavea Greene, Verbena L., Wyethia Nutt., Xanthoxys DC.
<i>Ashmeadiella cubiceps</i>	4	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Encelia Adans., Ericameria Nutt., Erigeron L., Helianthus Nutt., Hieracium L., Malacothrix DC.
<i>Ashmeadiella timberlakei</i>	7	Fabaceae: Astragalus L., Lotus L., Lupinus L., Psoralea Rydb., Trifolium L.
<i>Atoposmia abjecta</i>	26	Penstemon Schmidel [Keckiella Straw?]
<i>Atoposmia copelandica</i>	28	Phacelia Juss.
<i>Atoposmia triodonta</i>	5	Penstemon Schmidel [Keckiella Straw?]
<i>Calliopsis anthidius</i>	1	Trifolium L.
<i>Calliopsis edwardsii</i>	1	Horkelia Cham. & Schltld., Potentilla L.
<i>Calliopsis obscurella</i>	12	Eschscholzia Cham.
<i>Ceratina sequoiae</i>	7	Clarkia Pursh
<i>Chelostoma phaceliae</i>	46	Phacelia Juss.
<i>Colletes compactus</i>	98	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Solidago L.
<i>Colletes consors</i>	6	Boraginaceae; Hydrophyllaceae
<i>Colletes fulgidus</i>	107	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Colletes gypsicola</i>	187	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Verbena L.
<i>Colletes nigricornis</i>	26	Potentilla L.
<i>Colletes simulans</i>	2	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Solidago L.
<i>Diadasia diminuta</i>	67	Malvaceae: Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Diadasia enavata</i>	20	Asteraceae: Helianthus L.
<i>Diadasia lutzii</i>	39	Malvaceae: Eremalche Greene, Sphaeralcea A. St.-Hil.

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Diadasia nigrifrons</i>	65	Malvaceae: <i>Sidalcea</i> A. Gray
<i>Diadasia nitidifrons</i>	12	Malvaceae: <i>Iliamna</i> Greene, <i>Sidalcea</i> A. Gray, <i>Sphaeralcea</i> A. St.-Hil.
<i>Dianthidium subparvum</i>	33	Asteraceae: <i>Agoseris</i> Raf., <i>Chaenactis</i> DC., <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Corethrogyne</i> DC., <i>Encelia</i> Adans., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Gutierrezia</i> Lag., <i>Haplopappus</i> Cass., <i>Helianthus</i> L., <i>Helimeris</i> Nutt., <i>Machaeranthera</i> Nees, <i>Pentachaeta</i> Nutt., <i>Palafoxia</i> Lag., <i>Pyrrocoma</i> Hook., <i>Solidago</i> L., <i>Stephanomeria</i> Nutt., <i>Viguiera</i> Kunth
<i>Dianthidium ulkei</i>	50	Asteraceae: <i>Achillea</i> L., <i>Baileya</i> Harv. & A. Gray ex A. Gray, <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Gutierrezia</i> Lag., <i>Haplopappus</i> Cass., <i>Helenium</i> L., <i>Helianthus</i> L., <i>Heterotheca</i> Cass., <i>Hulsea</i> Torr. & A. Gray, <i>Lessingia</i> Cham., <i>Machaeranthera</i> Nees, <i>Pentachaeta</i> Nutt., <i>Solidago</i> L., <i>Stephanomeria</i> Nutt., <i>Symphotrichum</i> Nees, <i>Verbesina</i> L.
<i>Dufourea holocyanea</i>	3	<i>Symphoricarpos</i> Duham.
<i>Dufourea trochantera</i>	72	<i>Phacelia</i> Juss.
<i>Eucera acerba</i>	14	<i>Arctostaphylos</i> Adans.
<i>Eucera amsinckiae</i>	3	<i>Amsinckia</i> Lehm.
<i>Heriades cressoni</i>	8	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Helianthus</i> L., <i>Machaeranthera</i> Nees, <i>Senecio</i> L.
<i>Hylaeus basalis</i>	31	Rosaceae: <i>Potentilla</i> L.
<i>Lasioglossum aberrans</i>	1	<i>Oenothera</i> L.
<i>Megachile fidelis</i>	6	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Coreopsis</i> L., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Gutierrezia</i> Lag., <i>Haplopappus</i> Cass., <i>Helenium</i> L., <i>Helianthus</i> L., <i>Hemizonia</i> DC., <i>Heterotheca</i> Cass., <i>Holocarpha</i> Greene, <i>Machaeranthera</i> Nees, <i>Madia</i> Molina, <i>Plectrocephalus</i> D.Don, <i>Rudbeckia</i> L., <i>Senecio</i> L., <i>Solidago</i> L., <i>Symphotrichum</i> Nees, <i>Verbesina</i> L., <i>Viguiera</i> Kunth
<i>Megachile gravita</i>	1	<i>Clarkia</i> Pursh
<i>Megachile lapponica</i>	6	<i>Chamaenerion</i> Ség.
<i>Megachile melanophaea</i>	9	Fabaceae: <i>Astragalus</i> L., <i>Hedysarum</i> L., <i>Lotus</i> L., <i>Lupinus</i> L.
<i>Megachile mellitarsis</i>	3	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Encelia</i> Adans., <i>Grindelia</i> Willd., <i>Pluchea</i> Cass., <i>Senecio</i> L.

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Megachile nevadensis</i>	1	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Senecio L., Solidago L., Symphyotrichum Nees
<i>Megachile parallela</i>	17	Asteraceae: Baccharis L., Bebbia (Benth.) Greene, Chrysanthamnus Nutt., Coreopsis L., Corethrogyne DC., Deinandra Greene, Echinacea Moench, Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Hymenothrix A. Gray, Malacothrix DC., Palafoxia Lag., Plectrocephalus D.Don, Pyrrocoma Hook., Rudbeckia L., Senecio L., Solidago L., Stephanomeria Nutt., Tetraneuris Greene, Verbesina L., Wyethia Nutt.
<i>Megachile perihirta</i>	77	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	10	Asteraceae: Cirsium Mill.
<i>Megachile subnigra</i>	2	Asteraceae: Achillea L., Bebbia (Benth.) Greene, Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Eriophyllum Lag., Layia Hook. & Arn. ex DC., Senecio L.
<i>Megachile wheeleri</i>	5	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Machaeranthera Nees,
<i>Melissodes agilis</i>	4	Asteraceae: Cirsium Mill., Grindelia Willd., Helianthus L., Ratibida Raf., Rudbeckia L., Simsia Pers., Solidago L., Verbesina L.
<i>Melissodes bimatrix</i>	11	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Machaeranthera Nees, Symphyotrichum Nees, Verbesina L.
<i>Melissodes lupinus</i>	24	Asteraceae: Bidens L., Centromadia Greene, Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Plectrocephalus D.Don, Solidago L., Stephanomeria Nutt., Symphyotrichum Nees
<i>Melissodes microstictus</i>	44	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helenium L., Helianthus L., Heterotheca Cass., Plectrocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees
<i>Melissodes pallidesignatus</i>	3	Asteraceae: Coreopsis L., Engelmannia A. Gray ex Nutt., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Machaeranthera Nees, Plectrocephalus D.Don, Senecio L., Solidago L., Symphyotrichum Nees

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Melissodes rivalis</i>	7	Asteraceae: Brickellia Elliott, Cirsium Mill., Helianthus L., Plectocephalus D.Don
<i>Melissodes semilupinus</i>	1	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Helianthus L., Machaeranthera Nees, Senecio L., Symphyotrichum Nees
<i>Osmia brevis</i>	215	Penstemon Schmidel
<i>Osmia californica</i>	194	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Cirsium Mill., Ericameria Nutt., Heliomeris Nutt., Heterotheca Cass., Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia coloradensis</i>	108	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia integra</i>	11	Fabaceae: Astragalus L., Lotus L., Lupinus L., Thermopsis R. Br.
<i>Osmia longula</i>	19	Fabaceae: Astragalus L., Hedysarum L., Lupinus L.
<i>Osmia montana</i>	164	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nifoata</i>	1	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L., Trifolium L.
<i>Osmia nigrifrons</i>	19	Fabaceae: Astragalus L., Lupinus L., Trifolium L.
<i>Osmia regulina</i>	54	Fabaceae: Astragalus L., Trifolium L.
<i>Osmia ribifloris</i>	29	Ericaceae: Arctostaphylos Adans.
<i>Osmia subaustralis</i>	17	Asteraceae: Chaenactis DC., Cirsium Mill., Encelia Adans., Erigeron L., Grindelia Willd., Helianthus L., Heliomeris Nutt., Senecio L., Wyethia Nutt.
<i>Osmia texana</i>	12	Cirsium Mill.
<i>Perdita aemula</i>	14	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt. ; Eriogonum Michx.
<i>Perdita albipennis</i>	10	Asteraceae: Chrysanthamnus Nutt., Grindelia Willd., Helianthus L., Heterotheca Cass., Rudbeckia L., Symphyotrichum Nees, Verbesina L.
<i>Perdita ciliata</i>	1	Asteraceae: Ericameria Nutt., Euthamia Nutt. ex Cass., Heterotheca Cass., Senecio L., Solidago L.
<i>Perdita claypolei</i>	10	Eriogonum Michx.
<i>Perdita lepidosparti</i>	8	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Lepidospartum (A. Gray) A. Gray, Tetradymia DC.
<i>Perdita nevadensis</i>	4	Eriogonum Michx.

Table 5: Specialist bees present in the Blue Mountains Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Perdita oregonensis</i>	142	Asteraceae: Chaenactis DC., Chrysothamnus Nutt., Encelia Adans., Ericameria Nutt., Geraea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag.
<i>Perdita salicis</i>	9	Salix L.
<i>Perdita similis</i>	7	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Isocoma Nutt., Tetradymia DC.
<i>Perdita swezeyi</i>	33	Asteraceae: Erigeron L.
<i>Perdita zonalis</i>	305	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Eriogonum Michx., Gutierrezia Lag., Heterotheca Cass., Isocoma Nutt., Lepidospartum (A. Gray) A. Gray, Machaeranthera Nees, Solidago L., Symphyotrichum Nees



Figure 28: *Andrena astragali*, a specialist on *Toxicoscordion* spp., an association listed in Table 5.

Cascades Ecoregion

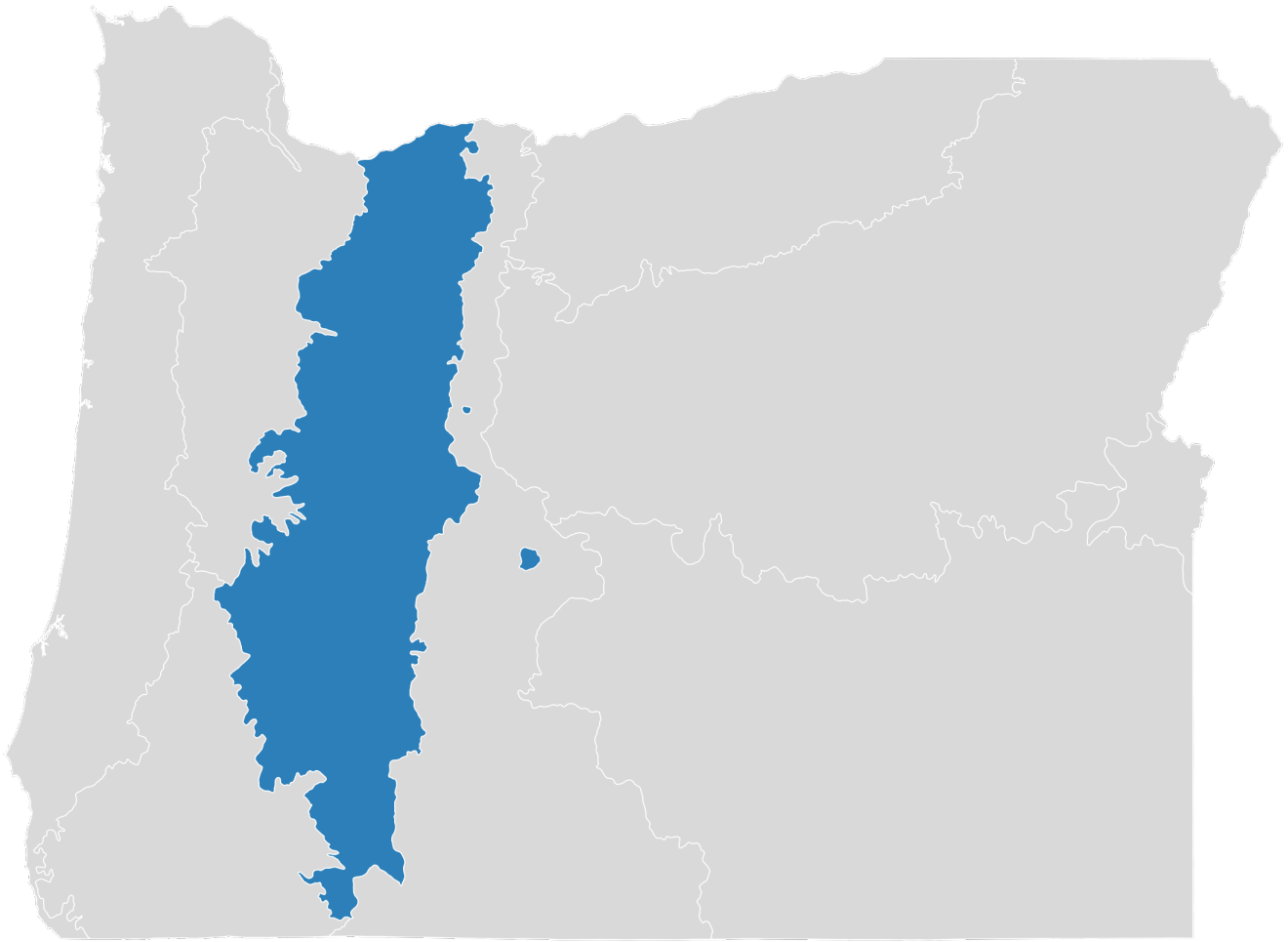


Figure 29: Level III Ecoregions of Oregon, with the Cascades ecoregion highlighted.

The Cascades Ecoregion bisects Oregon north to south and includes a small disjunction around Newberry Crater. The region is defined by a mild to severe mid-latitude climate based on elevation with warm, largely dry summers and cold, wet winters. Annual precipitation ranges from approximately 45 inches to 142 inches. The Cascades is a mountainous ecoregion consisting of dormant and active volcanoes, and includes Oregon's five highest peaks. The steep terrain has been shaped by periods of glaciation and carved by numerous snow and glacial melt rivers. While much of the region is dominated by conifer forests, pockets of meadows, lava plains, and rock gardens host a significant species richness of bees, including some species largely restricted to the subalpine environments in which their host plants are found. The native floral communities are largely intact, particularly at higher elevations.

303

Bee Species
Recorded

468

Plant Species
Recorded

3534

Bee-Plant
Interactions



Ecoregion Summary Map

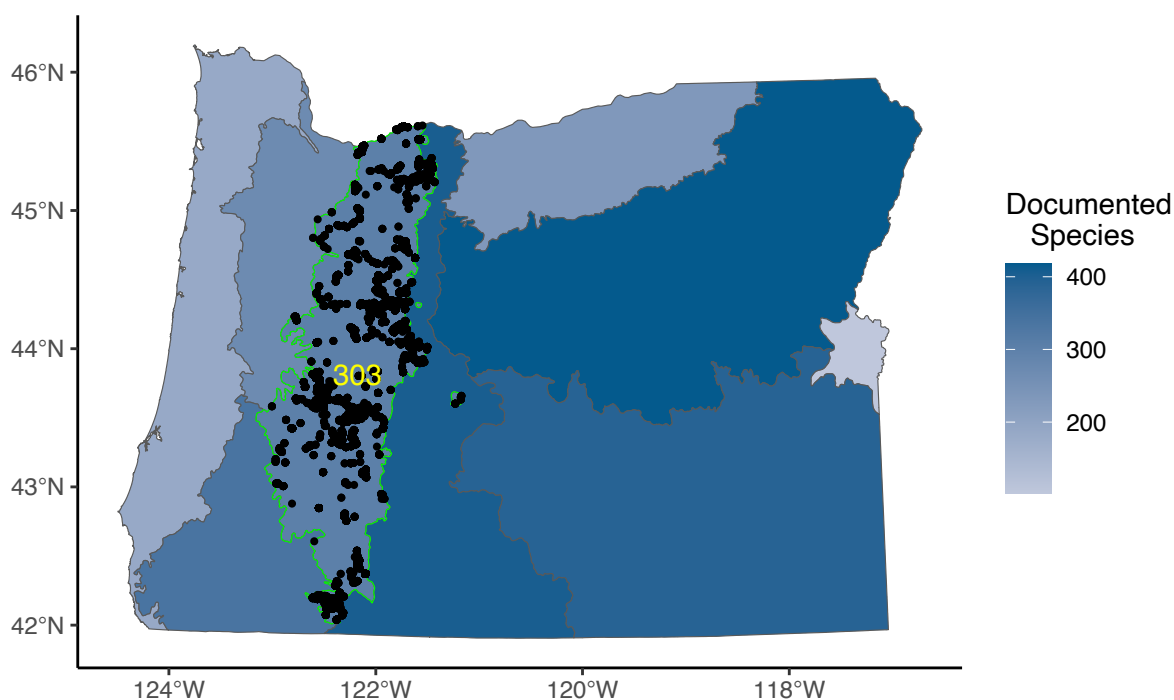


Figure 30: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Cascades Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Cascades Ecoregion.

Top Plants For Bee Richness

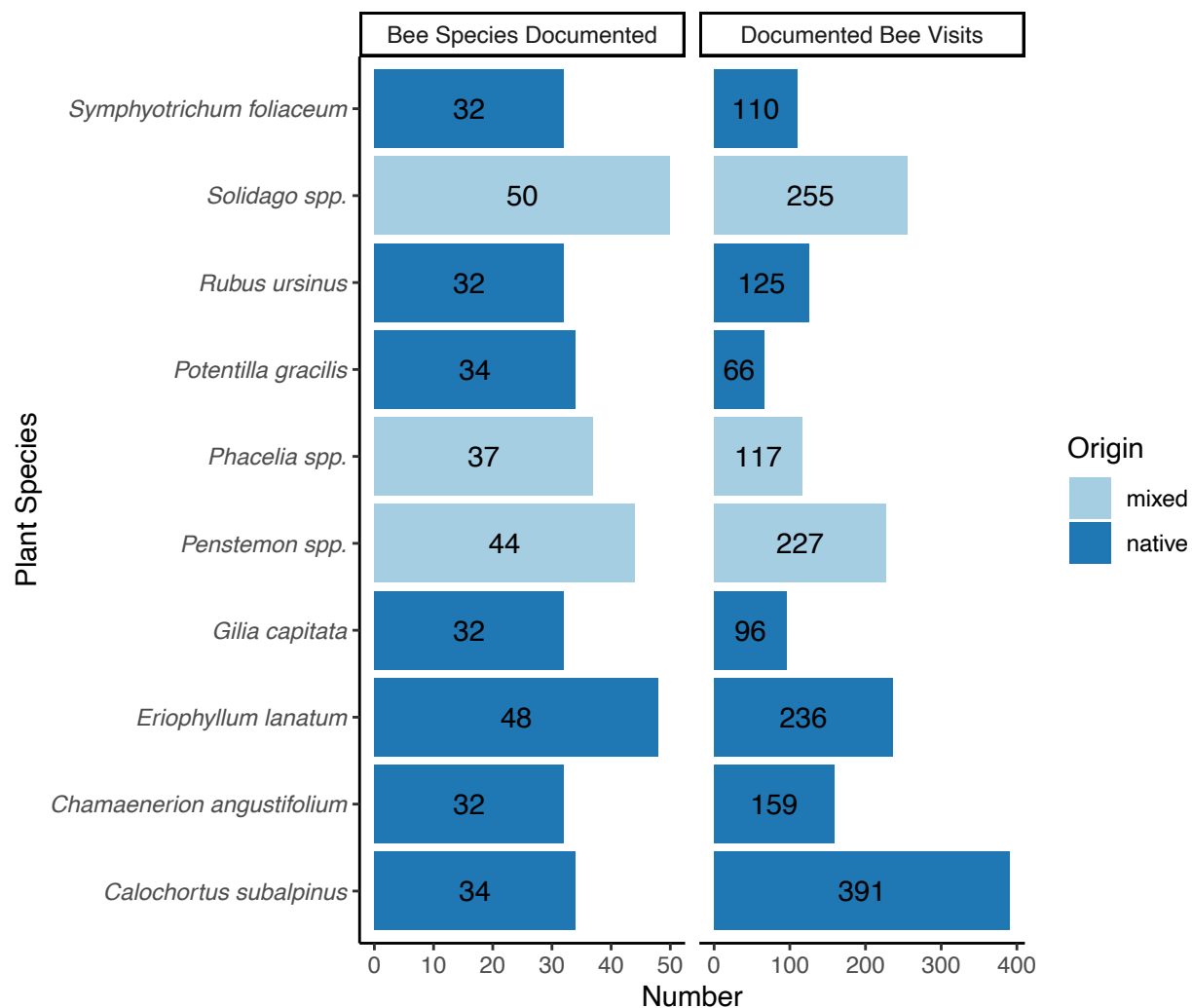


Figure 31: Top sampled plants for documented bee richness in the Cascades Ecoregion.

Top plants for bee richness, split by season

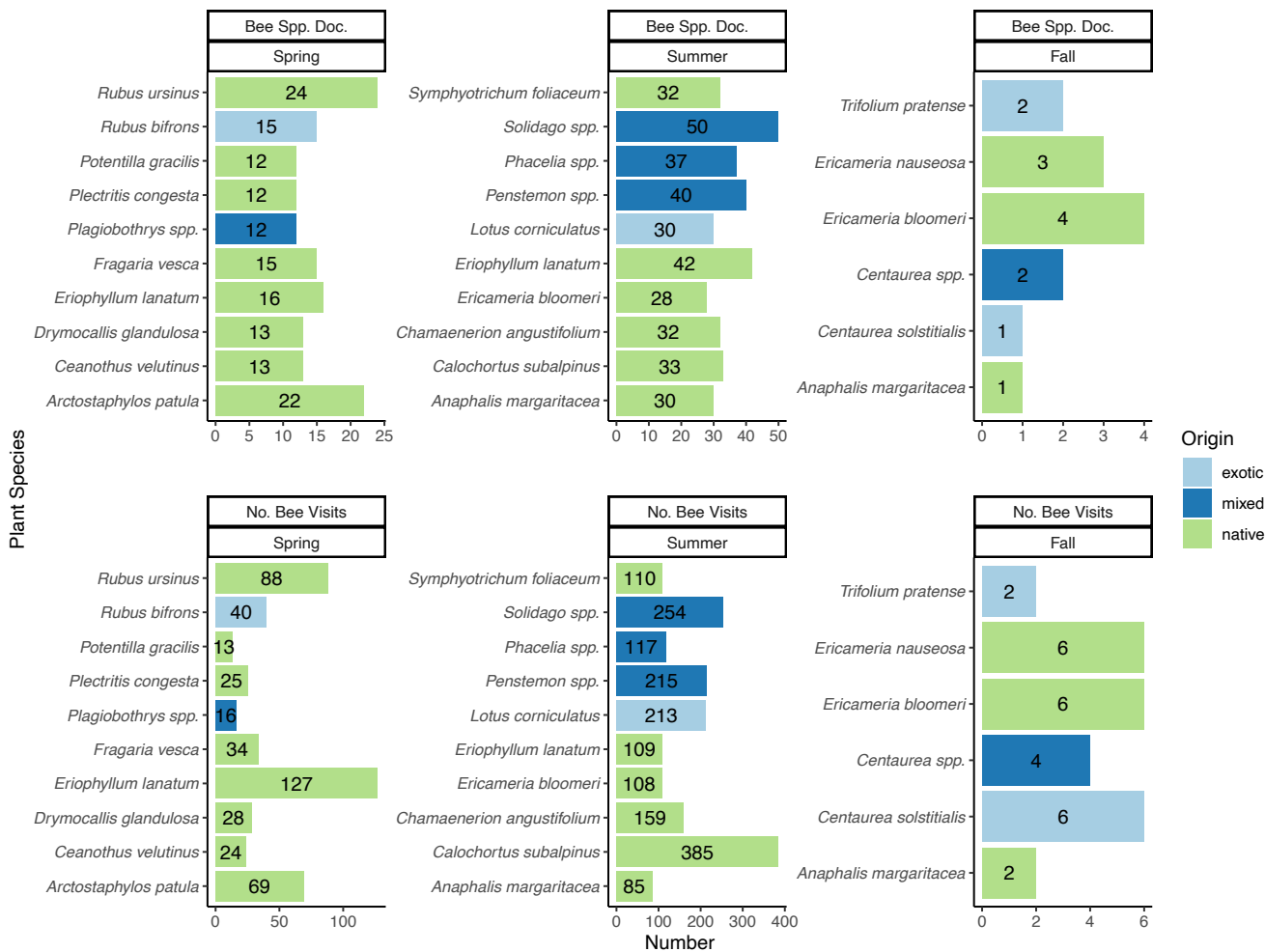


Figure 32: Top sampled plant species that support the most documented bee species by season in the Cascades Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Cascades ecoregion

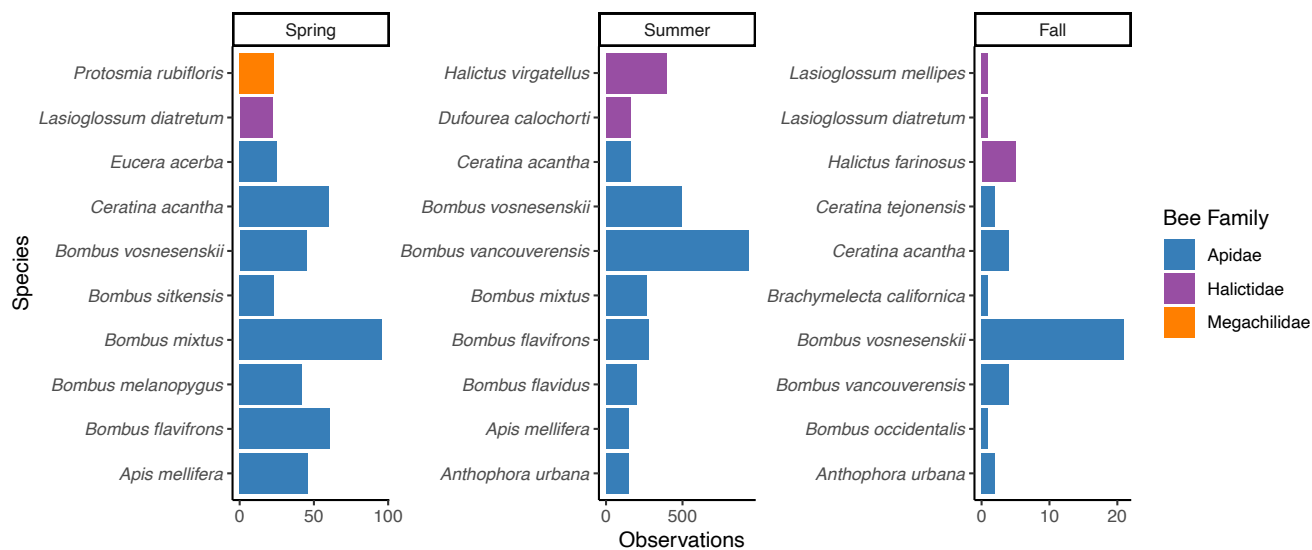


Figure 33: Most abundant bee species documented in the Cascades Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Cascades ecoregion

Table 6: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Cascades Ecoregion.

Bee Species	Observations
<i>Andrena fuscicauda</i>	1
<i>Andrena milwaukeensis</i>	1
<i>Andrena miranda</i>	1
<i>Andrena monogonoparia</i>	3
<i>Andrena ribblei</i>	4
<i>Anthidium emarginatum</i>	1
<i>Anthidium tenuiflorae</i>	9
<i>Ashmeadiella cactorum</i>	9
<i>Coelioxys alternatus</i>	3
<i>Coelioxys funerarius</i>	1
<i>Coelioxys hirsutissimus</i>	2
<i>Coelioxys porterae</i>	3
<i>Dianthidium heterulkei</i>	2
<i>Dufourea afasciata</i>	2
<i>Dufourea bernardina</i>	7

Table 6: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Cascades Ecoregion.

Bee Species	Observations
<i>Eucera fulvitaris</i>	1
<i>Hoplitis uvulalis</i>	2
<i>Hoplitis viridimicans</i>	5
<i>Lasioglossum colatum</i>	1
<i>Lasioglossum macoupinense</i>	1
<i>Lasioglossum marinense</i>	3
<i>Lasioglossum novascotiae</i>	1
<i>Lasioglossum tenax</i>	4
<i>Megachile anograe</i>	3
<i>Megachile inermis</i>	1
<i>Osmia atriventris</i>	1
<i>Osmia dolerosa</i>	1
<i>Osmia gaudiosa</i>	1
<i>Osmia inermis</i>	1
<i>Osmia malina</i>	2
<i>Osmia nifoata</i>	1
<i>Osmia tersula</i>	1
<i>Osmia thysanisca</i>	1
<i>Perdita transversa</i>	2
<i>Sphecodes prosphorus</i>	1
<i>Stelis carnifex</i>	1

Known specialist bee species present in the Cascades ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 7: Specialist bees present in the Cascades Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena astragali</i>	1	Zigadenus Michx. (Toxicoscordion Rydb.)
<i>Andrena birtwelli</i>	3	Potentilla L.

Table 7: Specialist bees present in the Cascades Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena caerulea</i>	8	Ranunculus L.
<i>Andrena cleodora</i>	12	Ceanothus L.
<i>Andrena colletina</i>	6	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Andrena columbiana</i>	7	Asteraceae: Heterotheca Cass., Solidago L.
<i>Andrena cuneilabris</i>	9	Ranunculus L.
<i>Andrena evoluta</i>	6	Agoseris Raf.
<i>Andrena microchlora</i>	1	Lomatium Raf.
<i>Andrena monogonoparia</i>	3	Arctostaphylos Adans.
<i>Andrena nothocalaidis</i>	1	Agoseris Raf.
<i>Andrena orthocarpus</i>	13	Lasthenia Cass.
<i>Andrena pensilis</i>	7	Lasthenia Cass.
<i>Andrena ribblei</i>	4	Polemonium L.
<i>Andrena salicifloris</i>	15	Salix L.
<i>Andrena scutellinitens</i>	54	Asteraceae: Achillea L., Anaphalis DC., Eurybia (Cass.) Cass., Erigeron L., Senecio L., Solidago L.
<i>Andrena surda</i>	1	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Machaeranthera Nees, Solidago L.
<i>Anthidium emarginatum</i>	1	Phacelia Juss.
<i>Anthidium mormonum</i>	10	Lotus L., Phacelia Juss.
<i>Anthidium tenuiflorae</i>	9	Fabaceae: Astragalus L., Lotus L.
<i>Anthidium utahense</i>	8	Fabaceae: Lotus L.
<i>Ashmeadiella buconis</i>	2	Asteraceae: Acamptopappus (A. Gray) A. Gray, Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Chrysothamnus Nutt., Coreopsis L., Echinacea Moench, Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Helianthus Nutt., Heterotheca Cass., Hymenoxys A. Gray, Isocoma Nutt., Lactuca L., Machaeranthera Nees, Pectis L., Pentstemon Nutt., Senecio L., Solidago L., Vancleavea Greene, Verbesina L., Wyethia Nutt., Xanthoxys DC.
<i>Ashmeadiella cubiceps</i>	7	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Encelia Adans., Ericameria Nutt., Erigeron L., Helianthus Nutt., Hieracium L., Malacothrix DC.
<i>Ashmeadiella timberlakei</i>	1	Fabaceae: Astragalus L., Lotus L., Lupinus L., Psoralea Rydb., Trifolium L.
<i>Atoposmia abjecta</i>	14	Penstemon Schmidel [Keckiella Straw?]
<i>Atoposmia copelandica</i>	19	Phacelia Juss.

Table 7: Specialist bees present in the Cascades Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Atoposmia oregona</i>	12	Penstemon Schmidel [Keckiella Straw?]
<i>Calliopsis edwardsii</i>	126	Horkelia Cham. & Schltldl., Potentilla L.
<i>Chelostoma minutum</i>	3	Boraginaceae: Cryptantha Lehm. ex G. Don, Eriodictyon Benth., Nama L., Nemophila Nutt., Phacelia Juss.
<i>Chelostoma phaceliae</i>	1	Phacelia Juss.
<i>Colletes consors</i>	1	Boraginaceae; Hydrophyllaceae
<i>Colletes fulgidus</i>	22	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Diadasia nigrifrons</i>	17	Malvaceae: Sidalcea A. Gray
<i>Diadasia nitidifrons</i>	3	Malvaceae: Iliamna Greene, Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Dianthidium subparvum</i>	4	Asteraceae: Agoseris Raf., Chaenactis DC., Chrysanthamnus Nutt., Cirsium Mill., Corethrogyne DC., Encelia Adans., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Helimeris Nutt., Machaeranthera Nees, Pentachaeta Nutt., Palafoxia Lag., Pyrrocoma Hook., Solidago L., Stephanomeria Nutt., Viguiera Kunth
<i>Dianthidium ulkei</i>	7	Asteraceae: Achillea L., Baileya Harv. & A. Gray ex A. Gray, Chrysanthamnus Nutt., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Heterotheca Cass., Hulsea Torr. & A. Gray, Lessingia Cham., Machaeranthera Nees, Pentachaeta Nutt., Solidago L., Stephanomeria Nutt., Symphyotrichum Nees, Verbesina L.
<i>Dufourea afasciata</i>	2	Trifolium L.
<i>Dufourea calochorti</i>	161	Calochortus Pursh
<i>Dufourea campanulae</i>	12	Campanula L.
<i>Dufourea holocyanea</i>	10	Symphoricarpos Duham.
<i>Dufourea trochantera</i>	48	Phacelia Juss.
<i>Eucera acerba</i>	25	Arctostaphylos Adans.
<i>Heriades cressoni</i>	7	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Machaeranthera Nees, Senecio L.
<i>Hylaeus basalis</i>	33	Rosaceae: Potentilla L.
<i>Lasioglossum aberrans</i>	1	Oenothera L.

Table 7: Specialist bees present in the Cascades Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Megachile fidelis</i>	32	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Machaeranthera Nees, Madia Molina, Plectocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees, Verbesina L., Viguiera Kunth
<i>Megachile lapponica</i>	7	Chamaenerion Ség.
<i>Megachile melanophaea</i>	8	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L.
<i>Megachile mellitarsis</i>	4	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Encelia Adans., Grindelia Willd., Pluchea Cass., Senecio L.
<i>Megachile parallela</i>	1	Asteraceae: Baccharis L., Bebbia (Benth.) Greene, Chrysanthamnus Nutt., Coreopsis L., Corethrogyne DC., Deinandra Greene, Echinacea Moench, Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Hy-menothrix A. Gray, Malacothrix DC., Palafoxia Lag., Plectocephalus D.Don, Pyrrocoma Hook., Rudbeckia L., Senecio L., Solidago L., Stephanomeria Nutt., Tetraneuris Greene, Verbesina L., Wyethia Nutt.
<i>Megachile perihirta</i>	31	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	49	Asteraceae: Cirsium Mill.
<i>Megachile subnigra</i>	3	Asteraceae: Achillea L., Bebbia (Benth.) Greene, Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Eriophyllum Lag., Layia Hook. & Arn. ex DC., Senecio L.
<i>Megachile wheeleri</i>	6	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Machaeranthera Nees,
<i>Melissodes lupinus</i>	10	Asteraceae: Bidens L., Centromadia Greene, Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Plectocephalus D.Don, Solidago L., Stephanomeria Nutt., Symphyotrichum Nees
<i>Melissodes microstictus</i>	43	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helenium L., Helianthus L., Heterotheca Cass., Plectocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees

Table 7: Specialist bees present in the Cascades Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Melissodes rivalis</i>	1	Asteraceae: Brickellia Elliott, Cirsium Mill., Helianthus L., Plectocephalus D.Don
<i>Osmia brevis</i>	36	Penstemon Schmidel
<i>Osmia californica</i>	12	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Cirsium Mill., Ericameria Nutt., Heliomeris Nutt., Heterotheca Cass., Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia coloradensis</i>	48	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia montana</i>	30	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nifoata</i>	1	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L., Trifolium L.
<i>Osmia regulina</i>	1	Fabaceae: Astragalus L., Trifolium L.
<i>Osmia ribifloris</i>	17	Ericaceae: Arctostaphylos Adans.
<i>Osmia subaustralis</i>	27	Asteraceae: Chaenactis DC., Cirsium Mill., Encelia Adans., Erigeron L., Grindelia Willd., Helianthus L., Heliomeris Nutt., Senecio L., Wyethia Nutt.
<i>Osmia texana</i>	11	Cirsium Mill.
<i>Perdita adjuncta</i>	1	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt.
<i>Perdita nevadensis</i>	7	Eriogonum Michx.
<i>Perdita zonalis</i>	1	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Eriogonum Michx., Gutierrezia Lag., Heterotheca Cass., Isocoma Nutt., Lepidospartum (A. Gray) A. Gray, Machaeranthera Nees, Solidago L., Symphyotrichum Nees

Coast Range Ecoregion

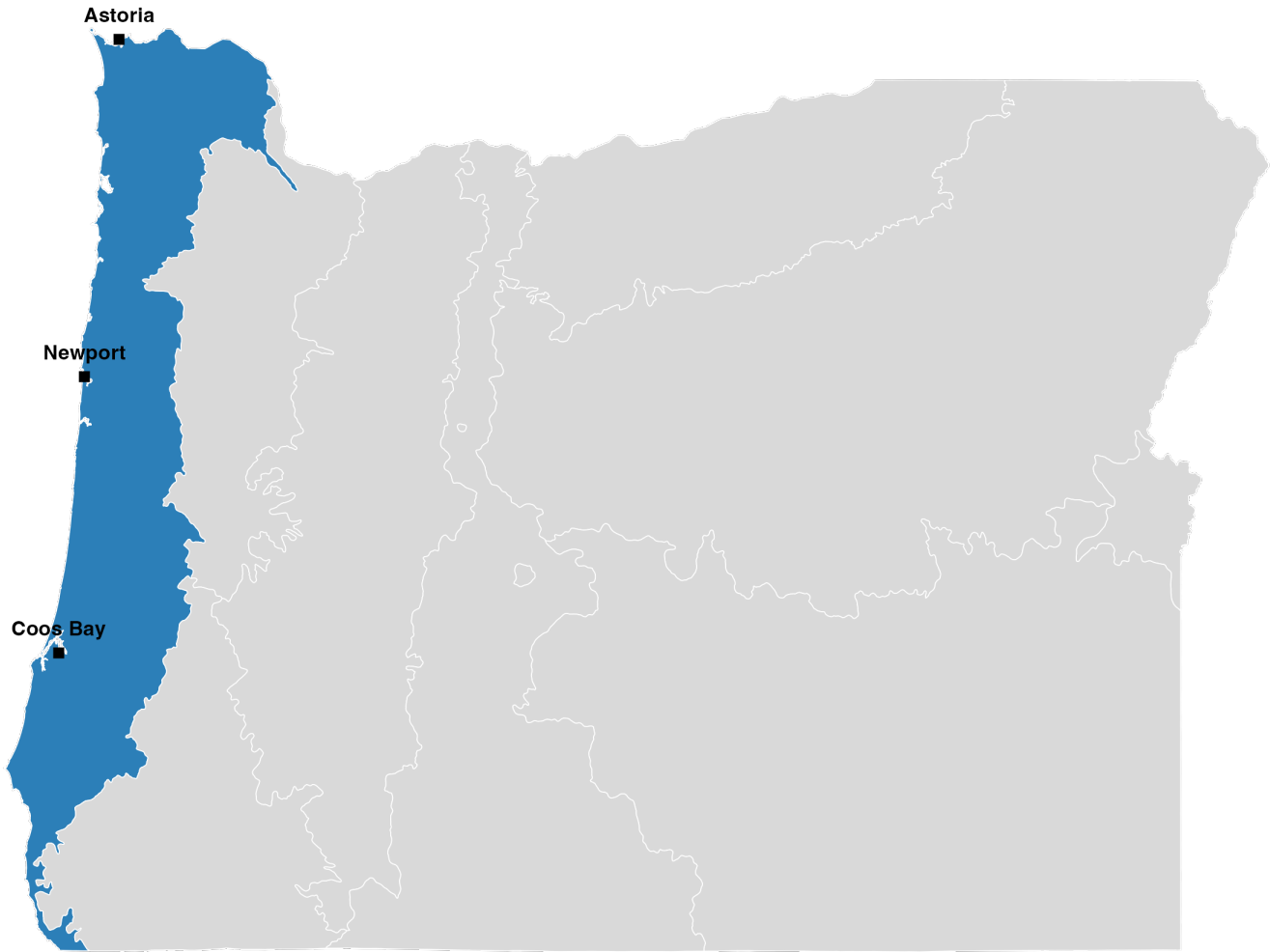


Figure 34: Level III Ecoregions of Oregon, with the Coast Range ecoregion highlighted.

The Coast Range Ecoregion stretches along the Pacific coastline, including rocky headlands, sandy shoreline, dunes, and the mountains and hills of the Oregon Coast Range. The ecoregion stretches to the interior valleys along most of its length, but is constricted by the Klamath Mountains Ecoregion at the southern end of the state. The Region is defined by marine west coast and Mediterranean climates with relatively warm, dry summers and mild, wet winters. Annual precipitation ranges from approximately 40 inches to nearly 200 inches. Much of the region is intensively managed and logged, and Douglas-fir plantations predominate. Vegetation communities are highly altered, and exotic plant species are extremely common. This is evident in the high number of bees collected from exotic plant species in this ecoregion. The Coast Range presents with the lowest species richness of bees, but is host to some uncommon species restricted to sand dune habitats.

185

Bee Species
Recorded

430

Plant Species
Recorded

2284

Bee-Plant
Interactions



Ecoregion Summary Map

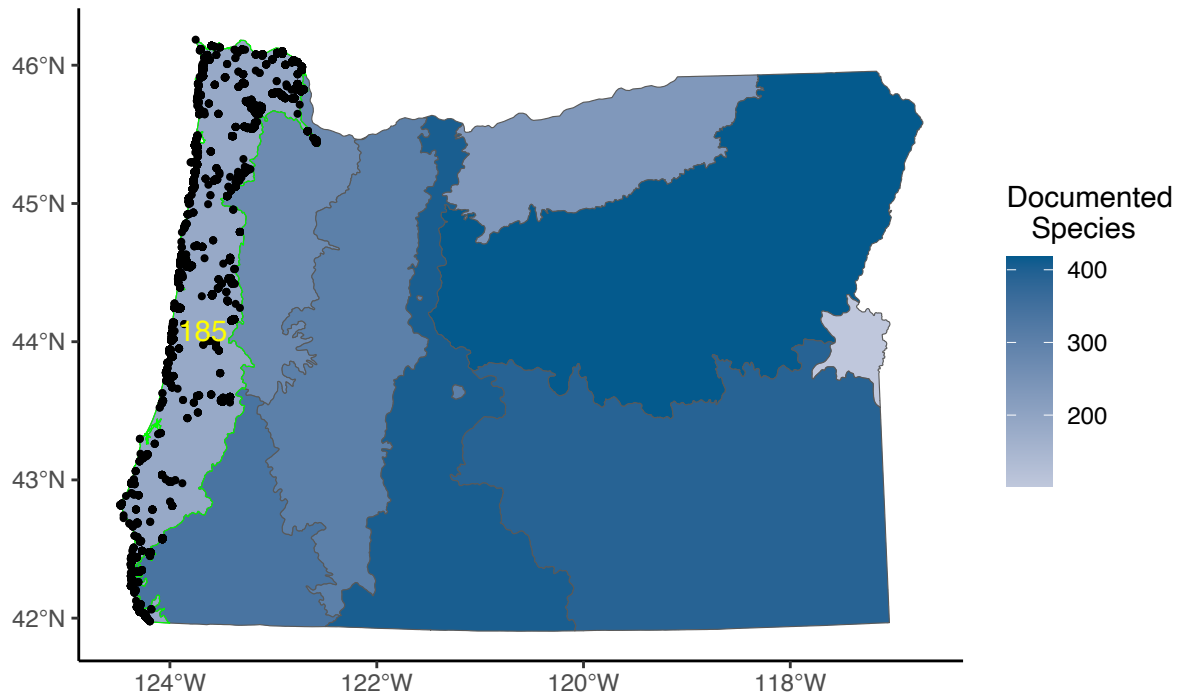


Figure 35: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Coast Range Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Coast Range Ecoregion.

Top Plants For Bee Richness

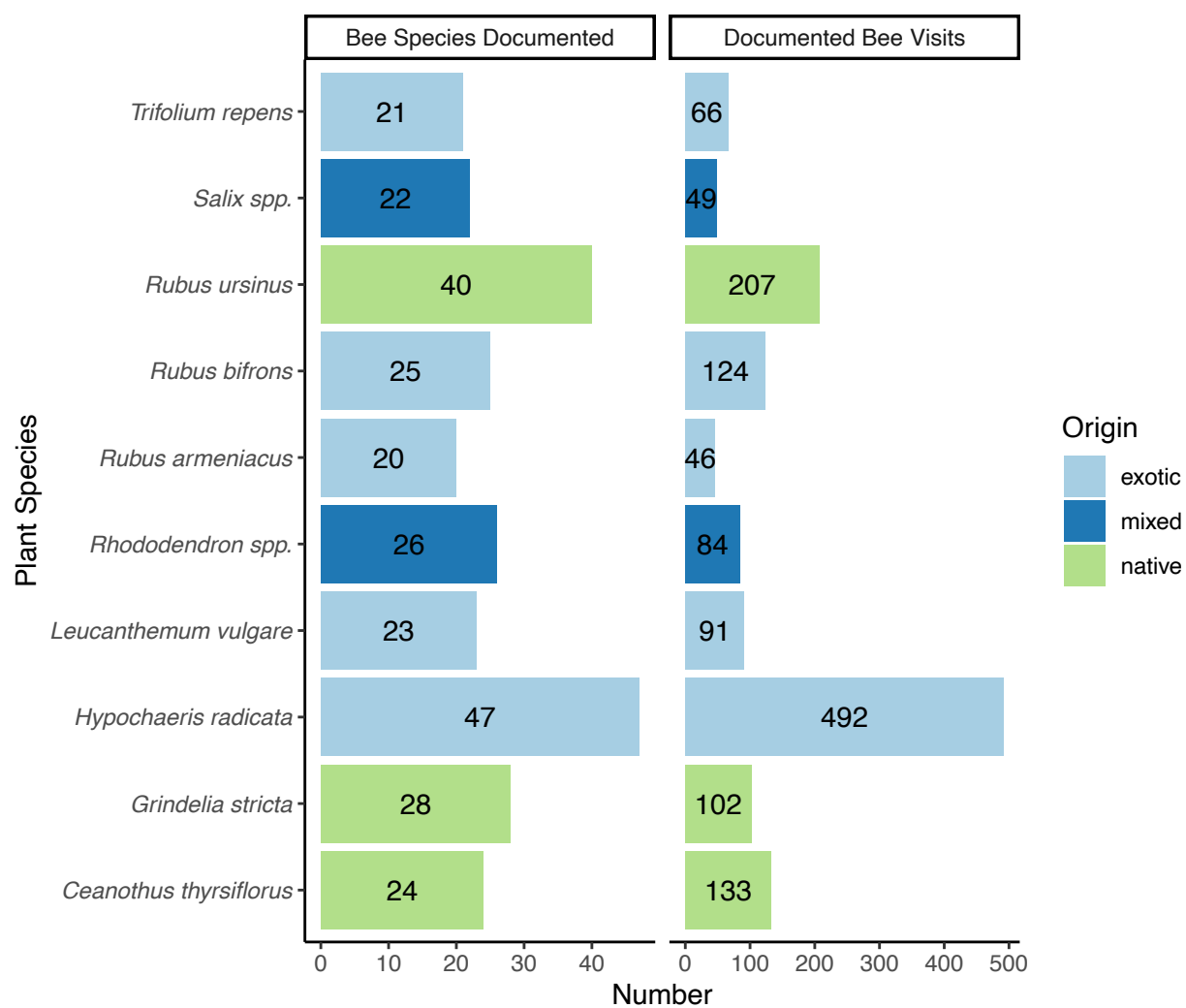


Figure 36: Top sampled plants for documented bee richness in the Coast Range Ecoregion.

Top plants for bee richness, split by season

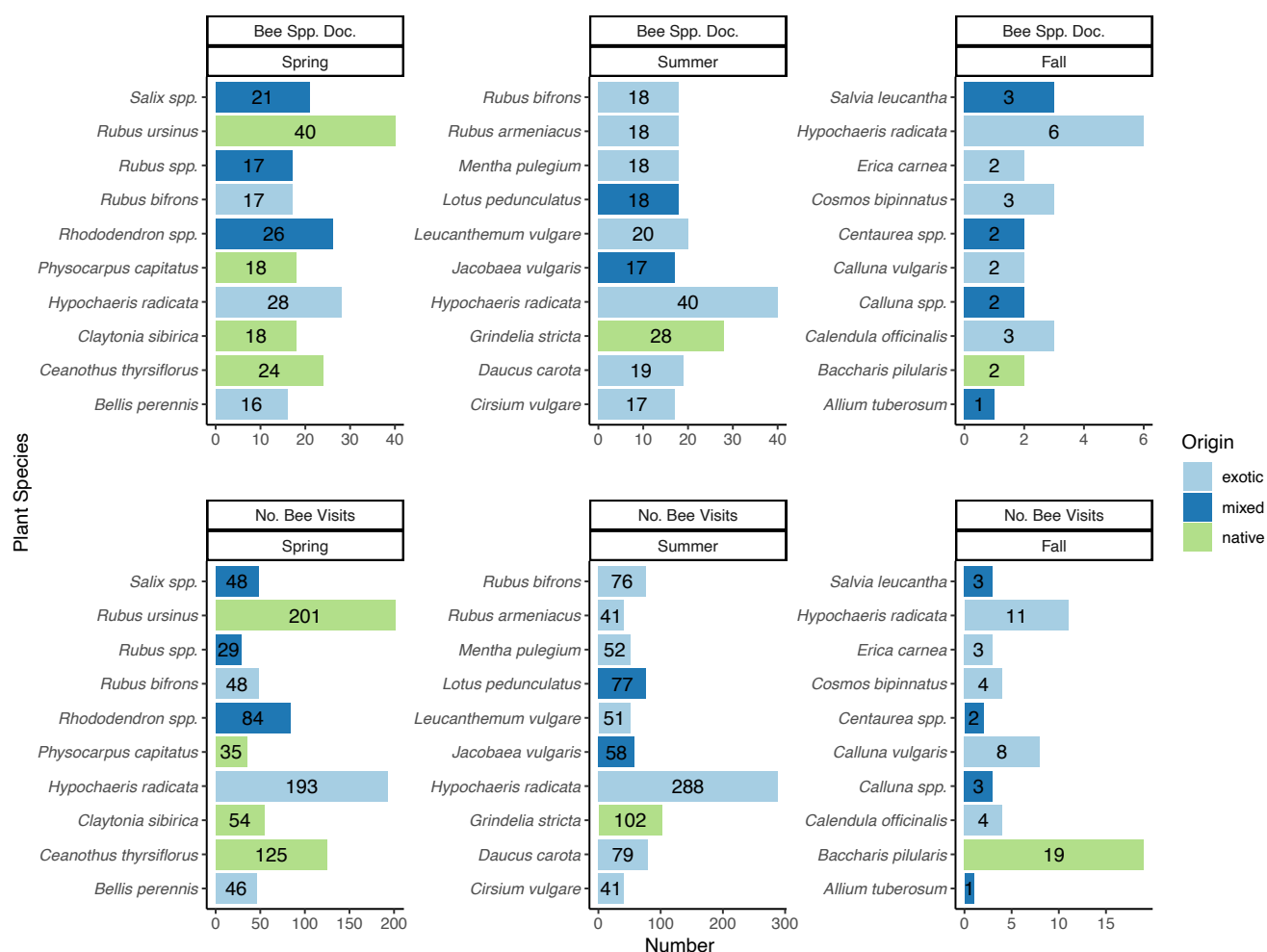


Figure 37: Top sampled plant species that support the most documented bee species by season in the Coast Range Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Coast Range ecoregion

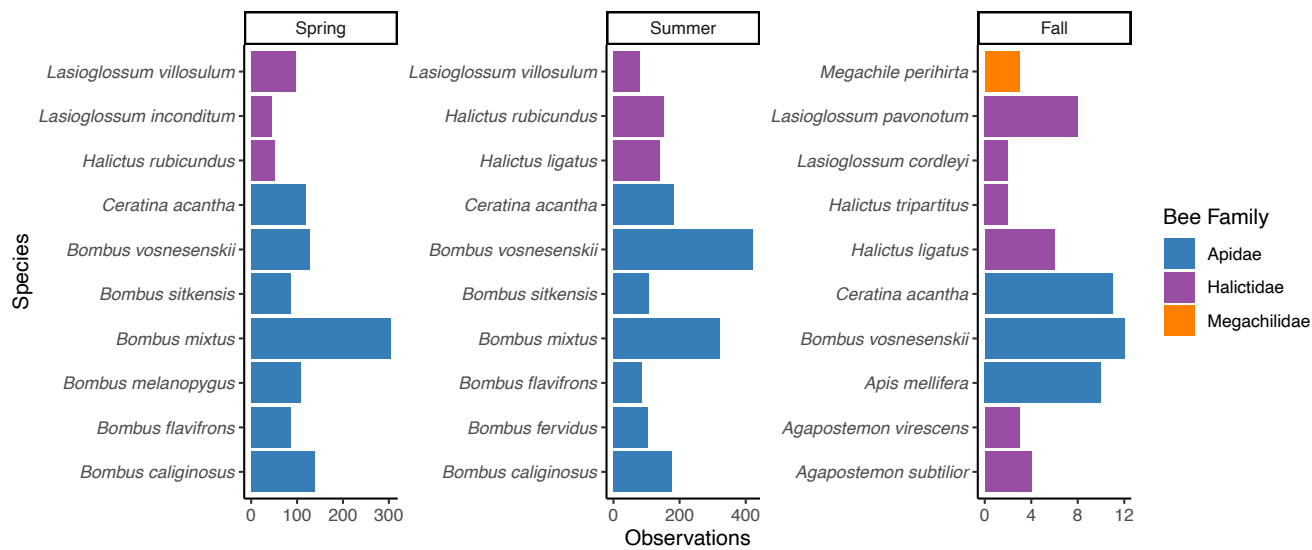


Figure 38: Most abundant bee species documented in the Coast Range Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Coast Range ecoregion

Table 8: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Coast Range Ecoregion.

Bee Species	Observations
<i>Andrena saccata</i>	3
<i>Epeolus minimus</i>	2
<i>Lasioglossum yukonae</i>	1
<i>Melissodes communis</i>	1
<i>Osmia raritatis</i>	1

Known specialist bee species present in the Coast Range ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 9: Specialist bees present in the Coast Range Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena caerulea</i>	1	Ranunculus L.
<i>Andrena columbiana</i>	17	Asteraceae: Heterotheca Cass., Solidago L.
<i>Andrena evoluta</i>	1	Agoseris Raf.
<i>Andrena frigida</i>	13	Salix L.
<i>Andrena orthocarpus</i>	11	Lasthenia Cass.
<i>Andrena perarmata</i>	6	Salix L.
<i>Andrena salicifloris</i>	13	Salix L.
<i>Atoposmia copelandica</i>	1	Phacelia Juss.
<i>Colletes fulgidus</i>	6	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Diadasia diminuta</i>	1	Malvaceae: Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Megachile fidelis</i>	1	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Machaeranthera Nees, Madia Molina, Plectrocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees, Verbesina L., Viguiera Kunth
<i>Megachile lapponica</i>	1	Chamaenerion Ség.
<i>Megachile melanophaea</i>	3	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L.
<i>Megachile perihirta</i>	43	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	2	Asteraceae: Cirsium Mill.
<i>Melissodes lupinus</i>	4	Asteraceae: Bidens L., Centromadia Greene, Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Plectrocephalus D.Don, Solidago L., Stephanomeria Nutt., Symphyotrichum Nees
<i>Melissodes microstictus</i>	57	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helianthus L., Helianthus L., Heterotheca Cass., Plectrocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees
<i>Melissodes rivalis</i>	4	Asteraceae: Brickellia Elliott, Cirsium Mill., Helianthus L., Plectrocephalus D.Don

Table 9: Specialist bees present in the Coast Range Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Osmia coloradensis</i>	5	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia montana</i>	1	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nigrifrons</i>	1	Fabaceae: Astragalus L., Lupinus L., Trifolium L.
<i>Osmia texana</i>	2	Cirsium Mill.



Figure 39: *Andrena caerulea* a specialist on *Ranunculus* spp., an association listed in Table 9.

Columbia Plateau Ecoregion

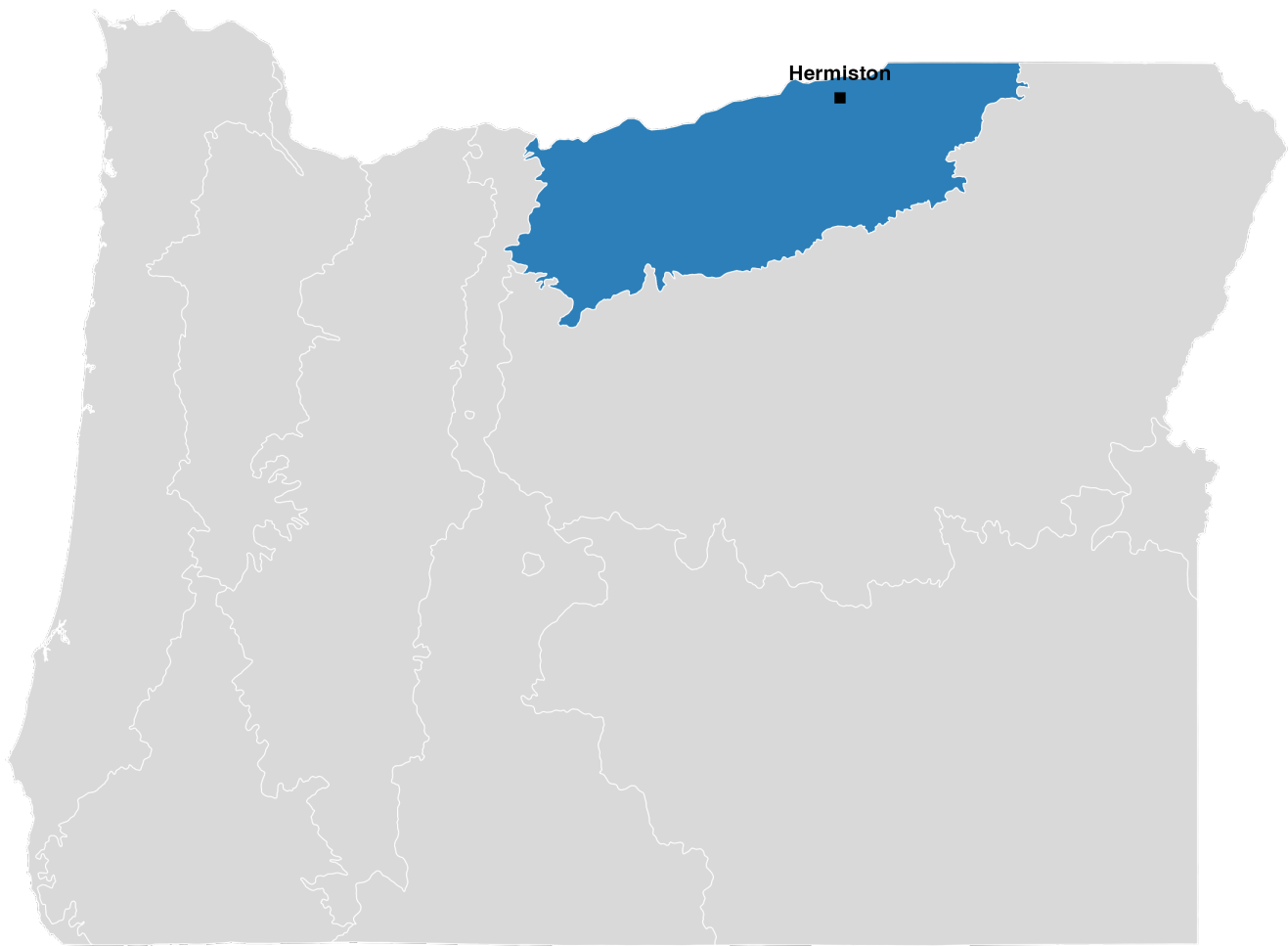


Figure 40: Level III Ecoregions of Oregon, with the Columbia Plateau ecoregion highlighted.

The Columbia Plateau Ecoregion covers a portion of north-central Oregon between the Eastern Cascades and Blue Mountains, abutting the Columbia River at the north. The Ecoregion is defined by mid-latitude desert and mid-latitude steppe climates, with hot, dry summers and cold winters. Annual precipitation in the region ranges from approximately 6 inches to 23 inches. The geology in the region is predominantly of volcanic origin and large, repeated lava flows and massive floods have shaped the topography. Sagebrush steppe and grasslands are the dominant vegetation communities.

233

Bee Species
Recorded

292

Plant Species
Recorded

1998

Bee-Plant
Interactions



Ecoregion Summary Map

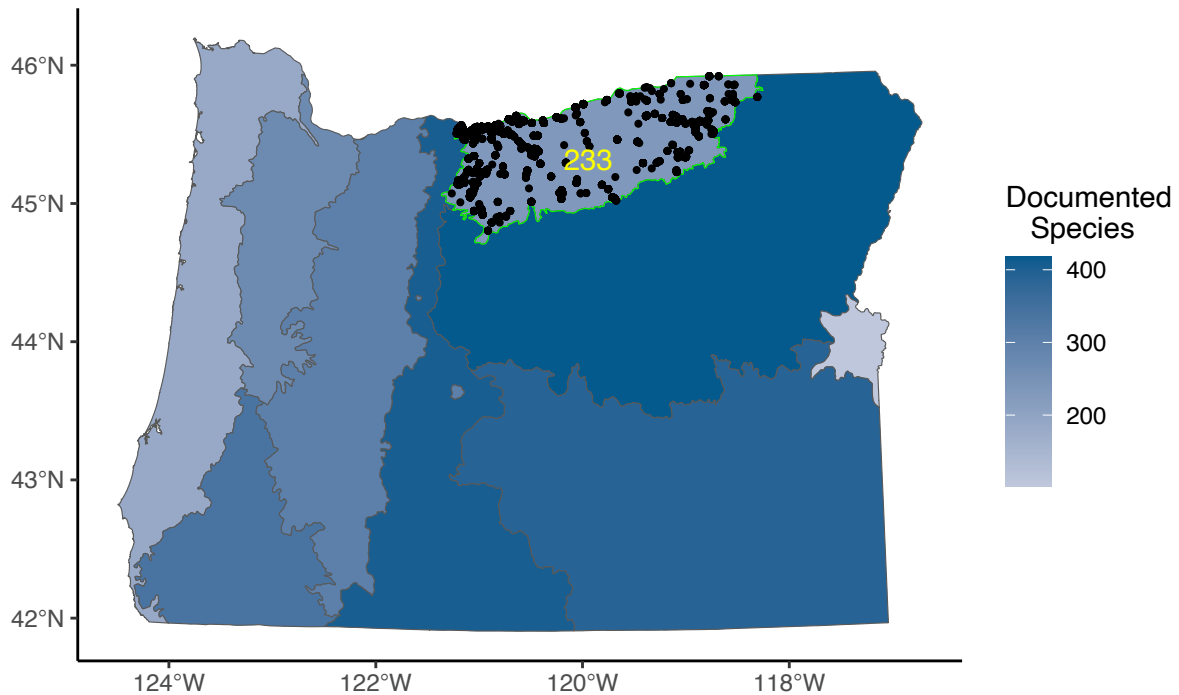


Figure 41: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Columbia Plateau Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Columbia Plateau Ecoregion.

Top Plants For Bee Richness

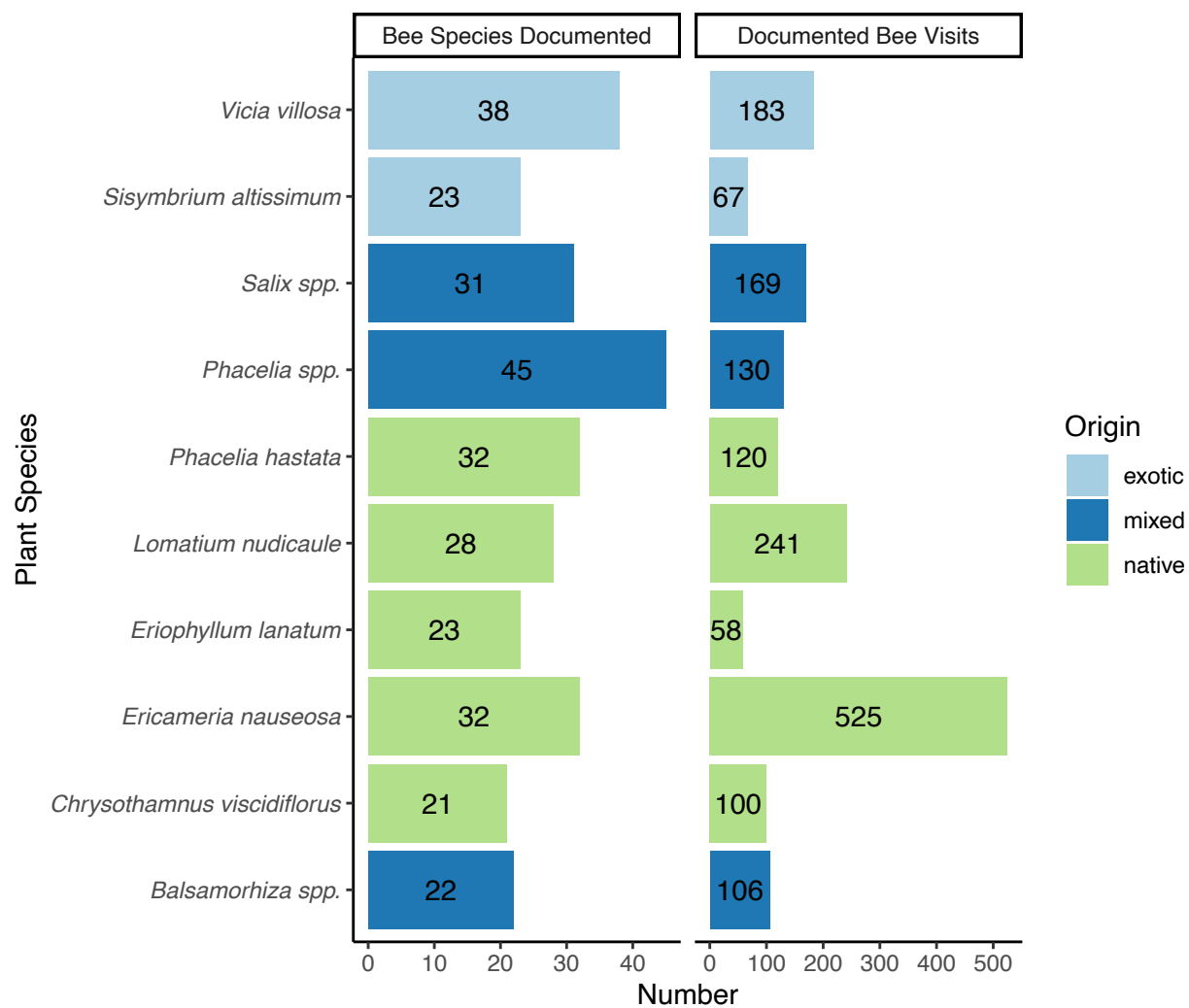


Figure 42: Top sampled plants for documented bee richness in the Columbia Plateau Ecoregion.

Top plants for bee richness, split by season

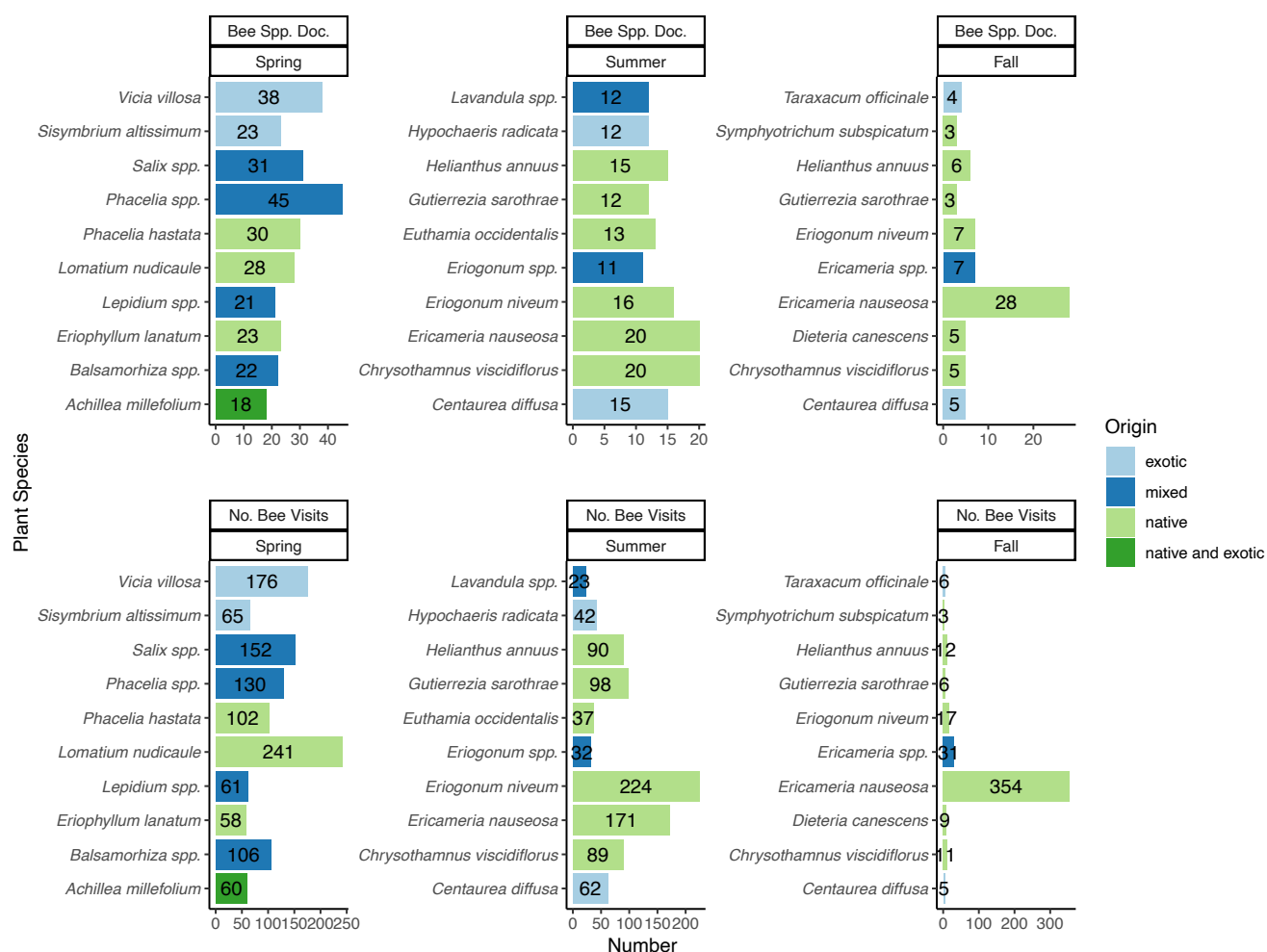


Figure 43: Top sampled plant species that support the most documented bee species by season in the Columbia Plateau Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Columbia Plateau ecoregion

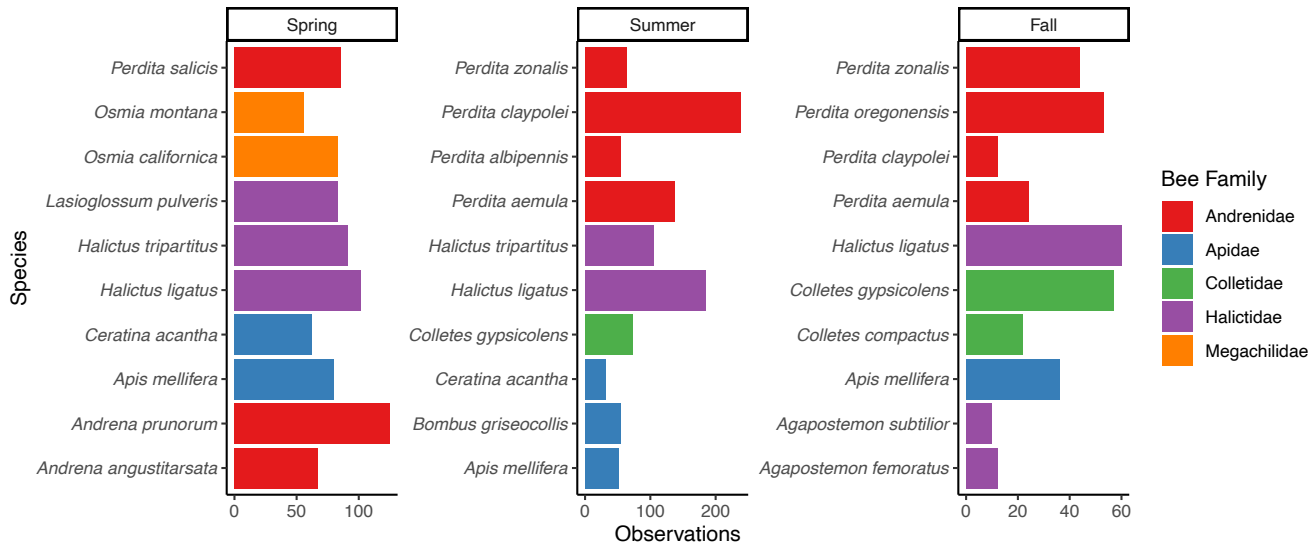


Figure 44: Most abundant bee species documented in the Columbia Plateau Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Columbia Plateau ecoregion

Table 10: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Columbia Plateau Ecoregion.

Bee Species	Observations
<i>Andrena citrinihirta</i>	7
<i>Andrena erythrogaster</i>	1
<i>Andrena forbesii</i>	1
<i>Andrena schuhi</i>	1
<i>Epeolus novomexicanus</i>	5
<i>Eucera amsinckiae</i>	4
<i>Lasioglossum dashwoodi</i>	1
<i>Lasioglossum macroprosopum</i>	3
<i>Lasioglossum novascotiae</i>	1
<i>Lasioglossum sedi</i>	1
<i>Megachile coquilletti</i>	1
<i>Megachile pseudonigra</i>	1
<i>Megachile umatillensis</i>	4
<i>Osmia cara</i>	1
<i>Stelis submarginata</i>	2

Table 10: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Columbia Plateau Ecoregion.

Bee Species	Observations
<i>Triepeolus argus</i>	1
<i>Triepeolus helianthi</i>	4
<i>Triepeolus punctoclypeus</i>	1
<i>Triepeolus saturninus</i>	1

Known specialist bee species present in the Columbia Plateau ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 11: Specialist bees present in the Columbia Plateau Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena caerulea</i>	4	Ranunculus L.
<i>Andrena citrinihirta</i>	7	Asteraceae: Baccharis L., Ericameria Nutt., Euthamia Nutt. ex Cass., Isocoma Nutt., Solidago L.
<i>Andrena colletina</i>	15	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Solidago L.
<i>Andrena erythrogaster</i>	1	Salix L.
<i>Andrena frigida</i>	1	Salix L.
<i>Andrena macoupinensis</i>	5	Salix L.
<i>Andrena nothocalaidis</i>	1	Agoseris Raf.
<i>Andrena orthocarpus</i>	1	Lasthenia Cass.
<i>Andrena salicifloris</i>	3	Salix L.
<i>Andrena scurra</i>	14	Brassicaceae: Lepidium L., Lesquerella S. Watson
<i>Andrena semipunctata</i>	6	Salix L.
<i>Andrena sulcata</i>	16	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt.
<i>Anthidium utahense</i>	3	Fabaceae: Lotus L.

Table 11: Specialist bees present in the Columbia Plateau Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Anthophora curta</i>	16	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Bebbia (Benth.) Greene, Coreopsis L., Corethrogyne DC., Deinandra Greene, Encelia Adans., Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Hemizonia DC., Heterotheca Cass., Hymenothrix A. Gray, Machaeranthera Nees, Palafoxia Lag., Solidago L., Stephanomeria Nutt., Verbesina L.
<i>Atoposmia copelandica</i>	6	Phacelia Juss.
<i>Calliopsis edwardsii</i>	4	Horkelia Cham. & Schltld., Potentilla L.
<i>Chelostoma phaceliae</i>	9	Phacelia Juss.
<i>Colletes compactus</i>	26	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Colletes consors</i>	7	Boraginaceae; Hydrophyllaceae
<i>Colletes fulgidus</i>	7	Asteraceae: Achillea L., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Colletes gypsicolens</i>	130	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Verbesina L.
<i>Diadasia enavata</i>	16	Asteraceae: Helianthus L.
<i>Dufourea trochantera</i>	1	Phacelia Juss.
<i>Eucera amsinckiae</i>	4	Amsinckia Lehm.
<i>Lasioglossum lusorium</i>	1	Oenothera L.
<i>Megachile parallela</i>	1	Asteraceae: Baccharis L., Bebbia (Benth.) Greene, Chrysothamnus Nutt., Coreopsis L., Corethrogyne DC., Deinandra Greene, Echinacea Moench, Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Hymenothrix A. Gray, Malacothrix DC., Palafoxia Lag., Plectrocephalus D.Don, Pyrrocoma Hook., Rudbeckia L., Senecio L., Solidago L., Stephanomeria Nutt., Tetraeneuris Greene, Verbesina L., Wyethia Nutt.
<i>Megachile perihirta</i>	2	Asteraceae, Fabaceae
<i>Megachile umatillensis</i>	4	Oenothera L.
<i>Megachile wheeleri</i>	3	Asteraceae: Achillea L., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Machaeranthera Nees,

Table 11: Specialist bees present in the Columbia Plateau Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Melissodes agilis</i>	9	Asteraceae: <i>Cirsium</i> Mill., <i>Grindelia</i> Willd., <i>Helianthus</i> L., <i>Ratibida</i> Raf., <i>Rudbeckia</i> L., <i>Simsia</i> Pers., <i>Solidago</i> L., <i>Verbesina</i> L.
<i>Melissodes bimatrix</i>	15	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Ericameria</i> Nutt., <i>Grindelia</i> Willd., <i>Gutierrezia</i> Lag., <i>Helianthus</i> L., <i>Isocoma</i> Nutt., <i>Machaeranthera</i> Nees, <i>Symphotrichum</i> Nees, <i>Verbesina</i> L.
<i>Melissodes lupinus</i>	3	Asteraceae: <i>Bidens</i> L., <i>Centromadia</i> Greene, <i>Cirsium</i> Mill., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Helianthus</i> L., <i>Hemizonia</i> DC., <i>Heterotheca</i> Cass., <i>Holocarpa</i> Greene, <i>Plectrocephalus</i> D.Don, <i>Solidago</i> L., <i>Stephanomeria</i> Nutt., <i>Symphotrichum</i> Nees
<i>Melissodes rivalis</i>	5	Asteraceae: <i>Brickellia</i> Elliott, <i>Cirsium</i> Mill., <i>Helianthus</i> L., <i>Plectrocephalus</i> D.Don
<i>Osmia californica</i>	90	Asteraceae: <i>Balsamorhiza</i> Nutt., <i>Chaenactis</i> DC., <i>Cirsium</i> Mill., <i>Ericameria</i> Nutt., <i>Heliomeris</i> Nutt., <i>Heterotheca</i> Cass., <i>Layia</i> Hook. & Arn. ex DC., <i>Senecio</i> L., <i>Wyethia</i> Nutt.
<i>Osmia coloradensis</i>	4	Asteraceae: <i>Chaenactis</i> DC., <i>Cirsium</i> Mill., <i>Coreopsis</i> L., <i>Encelia</i> Adans., <i>Erigeron</i> L., <i>Senecio</i> L.
<i>Osmia grinnelli</i>	2	Asteraceae: <i>Chaenactis</i> DC., <i>Coreopsis</i> L., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Hulsea</i> Torr. & A. Gray
<i>Osmia integra</i>	12	Fabaceae: <i>Astragalus</i> L., <i>Lotus</i> L., <i>Lupinus</i> L., <i>Thermopsis</i> R. Br.
<i>Osmia longula</i>	4	Fabaceae: <i>Astragalus</i> L., <i>Hedysarum</i> L., <i>Lupinus</i> L.
<i>Osmia montana</i>	60	Asteraceae: <i>Agoseris</i> Raf., <i>Chaenactis</i> DC., <i>Cirsium</i> Mill., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Eriophyllum</i> Lag., <i>Grindelia</i> Willd., <i>Helianthella</i> Torr. & A. Gray, <i>Hulsea</i> Torr. & A. Gray, <i>Layia</i> Hook. & Arn. ex DC., <i>Senecio</i> L., <i>Wyethia</i> Nutt.
<i>Osmia nigrifrons</i>	5	Fabaceae: <i>Astragalus</i> L., <i>Lupinus</i> L., <i>Trifolium</i> L.
<i>Osmia regulina</i>	27	Fabaceae: <i>Astragalus</i> L., <i>Trifolium</i> L.
<i>Osmia texana</i>	9	<i>Cirsium</i> Mill.
<i>Perdita aemula</i>	161	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Ericameria</i> Nutt. ; <i>Eriogonum</i> Michx.
<i>Perdita albipennis</i>	55	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Grindelia</i> Willd., <i>Helianthus</i> L., <i>Heterotheca</i> Cass., <i>Rudbeckia</i> L., <i>Symphotrichum</i> Nees, <i>Verbesina</i> L.
<i>Perdita ciliata</i>	15	Asteraceae: <i>Ericameria</i> Nutt., <i>Euthamia</i> Nutt. ex Cass., <i>Heterotheca</i> Cass., <i>Senecio</i> L., <i>Solidago</i> L.
<i>Perdita claypolei</i>	250	<i>Eriogonum</i> Michx.

Table 11: Specialist bees present in the Columbia Plateau Ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Perdita heliophila</i>	1	Asteraceae: Helianthus L.
<i>Perdita nevadensis</i>	1	Eriogonum Michx.
<i>Perdita oregonensis</i>	71	Asteraceae: Chaenactis DC., Chrysothamnus Nutt., Encelia Adans., Ericameria Nutt., Geraea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag.
<i>Perdita salicis</i>	86	Salix L.
<i>Perdita zonalis</i>	107	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Eriogonum Michx., Gutierrezia Lag., Heterotheca Cass., Isocoma Nutt., Lepidospartum (A. Gray) A. Gray, Machaeranthera Nees, Solidago L., Symphyotrichum Nees



Figure 45: *Perdita oregonensis* a specialist on Asteraceae such as *Ericameria* spp., an association listed in Table 11.

Eastern Cascades Ecoregion

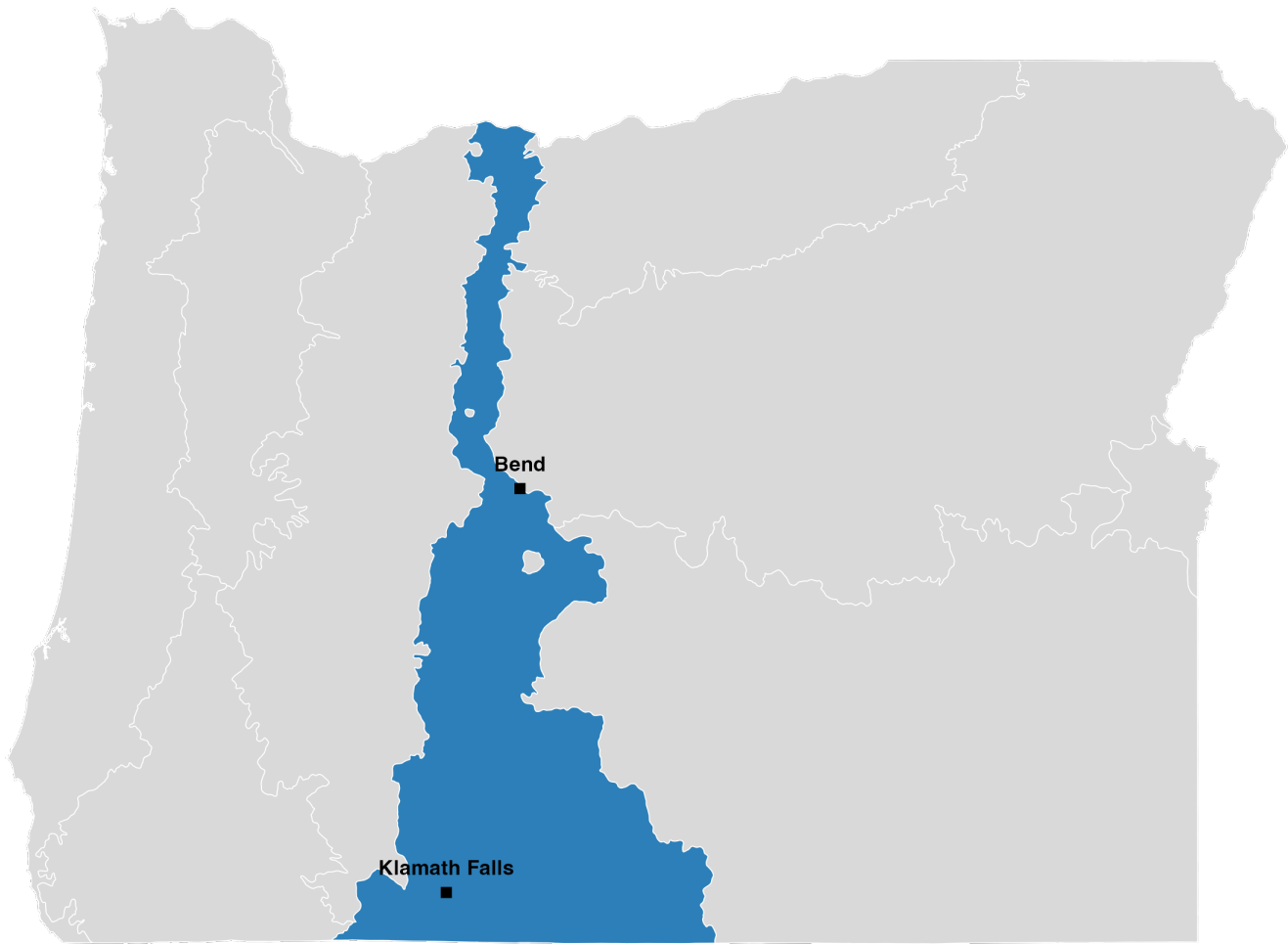


Figure 46: Level III Ecoregions of Oregon, with the Eastern Cascades Slopes and Foothills Ecoregion highlighted.

The Eastern Cascades Slopes and Foothills Ecoregion stretches north to south across the state in the rainshadow of the Cascades Ecoregion. The Ecoregion is defined by a continental climate with seasonal temperature extremes. Summers are warm and dry, while winters are cold, and annual precipitation ranges from 20 inches to nearly 140 inches at higher elevations. The geology is of volcanic origin, with some volcanic buttes and recent lava flows. Open pine forests dominate the slopes, grading into shrublands and grasslands on the lower elevation plateaus. The region hosts a very high species richness of bees, including some which are at the northern limit of their range.

405

Bee Species
Recorded

596

Plant Species
Recorded

5140

Bee-Plant
Interactions



Ecoregion Summary Map

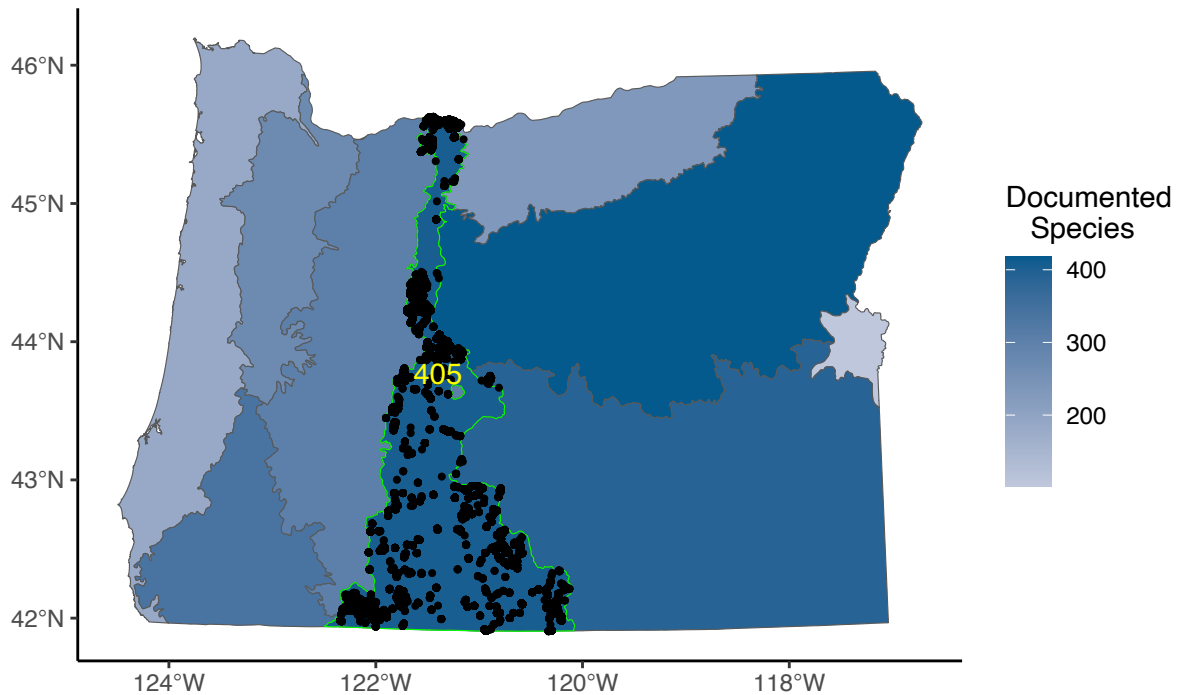


Figure 47: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Eastern Cascades Slopes and Foothills Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Eastern Cascades Slopes and Foothills Ecoregion.

Top Plants For Bee Richness

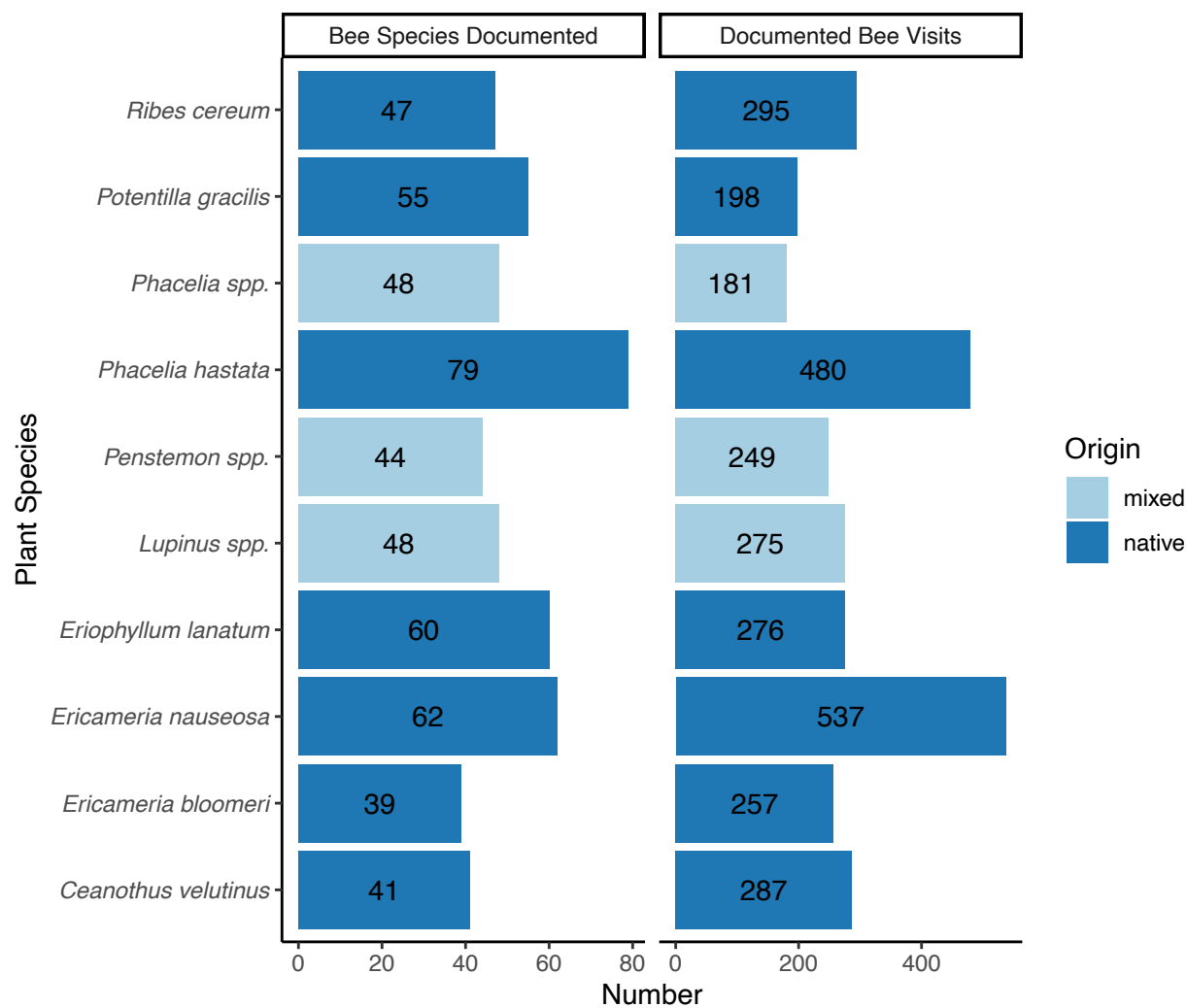


Figure 48: Top sampled plants for documented bee richness in the Eastern Cascades Slopes and Foothills Ecoregion.

Top plants for bee richness, split by season

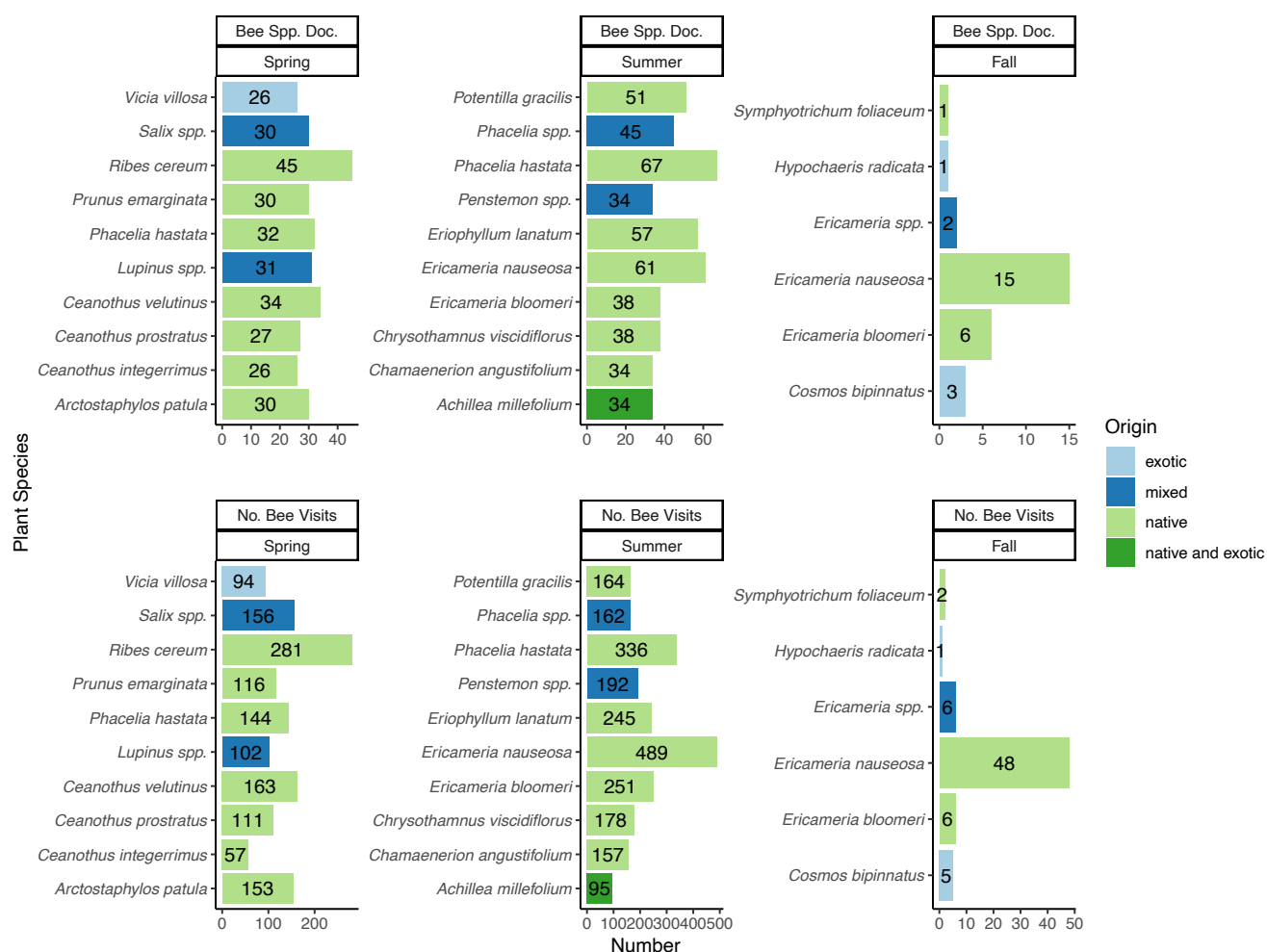


Figure 49: Top sampled plant species that support the most documented bee species by season in the Eastern Cascades Slopes and Foothills Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Eastern Cascades Slopes and Foothills ecoregion

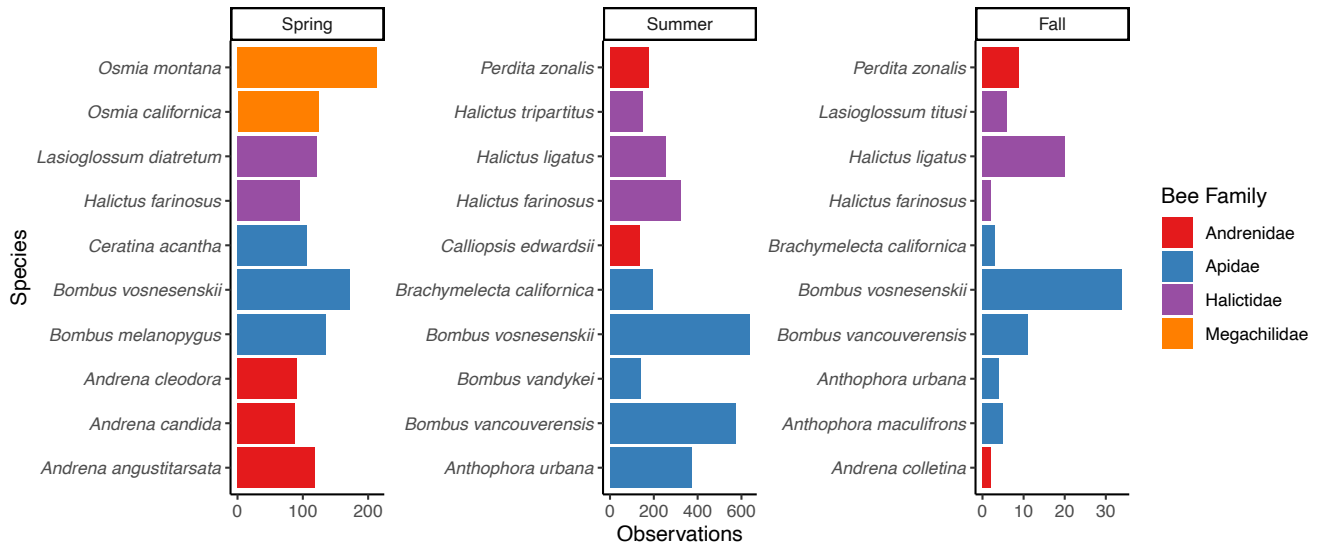


Figure 50: Most abundant bee species documented in the Eastern Cascades Slopes and Foothills Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Eastern Cascades Slopes and Foothills ecoregion

Table 12: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Eastern Cascades Slopes and Foothills Ecoregion.

Bee Species	Observations
<i>Andrena barbilabris</i>	1
<i>Andrena candidiformis</i>	6
<i>Andrena forbesii</i>	3
<i>Andrena medionitens</i>	1
<i>Andrena miranda</i>	2
<i>Andrena monogonoparia</i>	6
<i>Andrena proluxa</i>	1
<i>Andrena schuhi</i>	5
<i>Andrena transnigra</i>	1
<i>Anthidium edwardsii</i>	1
<i>Anthidium emarginatum</i>	3
<i>Anthidium formosum</i>	2
<i>Anthidium illustre</i>	1
<i>Anthophora affabilis</i>	1

Table 12: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Eastern Cascades Slopes and Foothills Ecoregion.

Bee Species	Observations
<i>Ashmeadiella cactorum</i>	1
<i>Calliopsis scitula</i>	1
<i>Coelioxys alternatus</i>	1
<i>Coelioxys novomexicanus</i>	2
<i>Coelioxys porterae</i>	1
<i>Dianthidium heterulkei</i>	3
<i>Dianthidium plenum</i>	2
<i>Dioxys productus</i>	3
<i>Dufourea bernardina</i>	1
<i>Epeolus americanus</i>	1
<i>Eucera amsinckiae</i>	5
<i>Heriades variolosa</i>	3
<i>Hoplitis uvulalis</i>	2
<i>Lasioglossum californicum</i>	1
<i>Lasioglossum cembrilacus</i>	3
<i>Lasioglossum colatum</i>	1
<i>Lasioglossum dashwoodi</i>	2
<i>Lasioglossum marinense</i>	1
<i>Lasioglossum novascotiae</i>	1
<i>Lasioglossum prasinogaster</i>	1
<i>Megachile addenda</i>	3
<i>Megachile coquilletti</i>	1
<i>Megachile inermis</i>	1
<i>Megachile lippiae</i>	1
<i>Megachile pseudonigra</i>	1
<i>Megachile texana</i>	1
<i>Melissodes communis</i>	1
<i>Osmia bella</i>	1
<i>Osmia cara</i>	2
<i>Osmia gaudiosa</i>	1
<i>Osmia inermis</i>	1
<i>Osmia inurbana</i>	1
<i>Osmia malina</i>	1
<i>Osmia obliqua</i>	2

Table 12: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Eastern Cascades Slopes and Foothills Ecoregion.

Bee Species	Observations
<i>Osmia raritatis</i>	2
<i>Osmia thysanisca</i>	1
<i>Perdita transversa</i>	6
<i>Protandrena californica</i>	1
<i>Sphecodes olympicus</i>	1
<i>Sphecodes prosphorus</i>	2
<i>Stelis monticola</i>	3

Known specialist bee species present in the Eastern Cascades Slopes and Foothills ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 13: Specialist bees present in the Eastern Cascades Slopes and Foothills ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena bendensis</i>	29	Asteraceae: Ericameria Nutt.
<i>Andrena caerulea</i>	18	Ranunculus L.
<i>Andrena candidiformis</i>	6	Ceanothus L., Lomatium Raf.
<i>Andrena cleodora</i>	117	Ceanothus L.
<i>Andrena colletina</i>	20	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Andrena columbiana</i>	2	Asteraceae: Heterotheca Cass., Solidago L.
<i>Andrena cuneilabris</i>	8	Ranunculus L.
<i>Andrena evoluta</i>	18	Agoseris Raf.
<i>Andrena frigida</i>	4	Salix L.
<i>Andrena illinoiensis</i>	1	Salix L.
<i>Andrena microchlora</i>	5	Lomatium Raf.
<i>Andrena monogonoparia</i>	6	Arctostaphylos Adans.
<i>Andrena nothocalaidis</i>	14	Agoseris Raf.
<i>Andrena orthocarpus</i>	22	Lasthenia Cass.

Table 13: Specialist bees present in the Eastern Cascades Slopes and Foothills ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena perarmata</i>	2	Salix L.
<i>Andrena piperi</i>	1	Brassicaceae: Descurainia Webb & Bethel., Lepidium L., Lesquerella S. Watson, Physaria (Nutt. ex Torr. & A. Gray) A. Gray
<i>Andrena salicifloris</i>	26	Salix L.
<i>Andrena scutellinitens</i>	66	Asteraceae: Achillea L., Anaphalis DC., Eurybia (Cass.) Cass., Erigeron L., Senecio L., Solidago L.
<i>Andrena semipunctata</i>	22	Salix L.
<i>Andrena striatifrons</i>	56	Salix L.
<i>Andrena subaustralis</i>	1	Salix L.
<i>Andrena submoesta</i>	7	Lasthenia Cass.
<i>Andrena sulcata</i>	1	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt.
<i>Andrena surda</i>	4	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Machaeranthera Nees, Solidago L.
<i>Anthidium emarginatum</i>	3	Phacelia Juss.
<i>Anthidium mormonum</i>	23	Lotus L., Phacelia Juss.
<i>Anthidium utahense</i>	3	Fabaceae: Lotus L.
<i>Anthophora affabilis</i>	1	Oenothera L.
<i>Anthophora maculifrons</i>	23	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Vancleavea Greene
<i>Ashmeadiella buconis</i>	5	Asteraceae: Acamptopappus (A. Gray) A. Gray, Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Chrysanthamnus Nutt., Coreopsis L., Echinacea Moench, Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Helianthus Nutt., Heterotheca Cass., Hymenoxys A. Gray, Isocoma Nutt., Lactuca L., Machaeranthera Nees, Pectis L., Pentstemon Nutt., Senecio L., Solidago L., Vancleavea Greene, Verbesina L., Wyethia Nutt., Xanthoxys DC.
<i>Ashmeadiella cubiceps</i>	4	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Encelia Adans., Ericameria Nutt., Erigeron L., Helianthus Nutt., Hieracium L., Malacothrix DC.
<i>Ashmeadiella timberlakei</i>	4	Fabaceae: Astragalus L., Lotus L., Lupinus L., Psoralea Rydb., Trifolium L.
<i>Atoposmia abjecta</i>	2	Penstemon Schmidel [Keckia Straw?]
<i>Atoposmia anthodyta</i>	22	Penstemon Schmidel [Keckia Straw?]
<i>Atoposmia copelandica</i>	8	Phacelia Juss.
<i>Calliopsis anthidius</i>	2	Trifolium L.
<i>Calliopsis edwardsii</i>	145	Horkelia Cham. & Schltdl., Potentilla L.

Table 13: Specialist bees present in the Eastern Cascades Slopes and Foothills ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Calliopsis obscurella</i>	3	Eschscholzia Cham.
<i>Ceratina sequoiae</i>	1	Clarkia Pursh
<i>Chelostoma minutum</i>	7	Boraginaceae: Cryptantha Lehm. ex G. Don, Eriodictyon Benth., Nama L., Nemophila Nutt., Phacelia Juss.
<i>Chelostoma phaceliae</i>	12	Phacelia Juss.
<i>Colletes compactus</i>	4	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Colletes consors</i>	2	Boraginaceae; Hydrophyllaceae
<i>Colletes fulgidus</i>	17	Asteraceae: Achillea L., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Colletes gypsicolens</i>	20	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Verbesina L.
<i>Diadasia bituberculata</i>	2	Calystegia R. Br., Convolvulus L.
<i>Diadasia enavata</i>	1	Asteraceae: Helianthus L.
<i>Diadasia nigrifrons</i>	50	Malvaceae: Sidalcea A. Gray
<i>Diadasia nitidifrons</i>	10	Malvaceae: Iliamna Greene, Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Dianthidium subparvum</i>	14	Asteraceae: Agoseris Raf., Chaenactis DC., Chrysothamnus Nutt., Cirsium Mill., Corethrogyne DC., Encelia Adans., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Helimeris Nutt., Machaeranthera Nees, Pentachaeta Nutt., Palafoxia Lag., Pyrrocoma Hook., Solidago L., Stephanomeria Nutt., Viguiera Kunth
<i>Dianthidium ulkei</i>	31	Asteraceae: Achillea L., Baileya Harv. & A. Gray ex A. Gray, Chrysothamnus Nutt., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Heterotheca Cass., Hulsea Torr. & A. Gray, Lessingia Cham., Machaeranthera Nees, Pentachaeta Nutt., Solidago L., Stephanomeria Nutt., Symphyotrichum Nees, Verbesina L.
<i>Dufourea holocyanea</i>	12	Symphoricarpos Duham.
<i>Dufourea trochantera</i>	37	Phacelia Juss.
<i>Eucera acerba</i>	25	Arctostaphylos Adans.
<i>Eucera amsinckiae</i>	5	Amsinckia Lehm.

Table 13: Specialist bees present in the Eastern Cascades Slopes and Foothills ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Heriades cressoni</i>	21	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Machaeranthera Nees, Senecio L.
<i>Hylaeus basalis</i>	77	Rosaceae: Potentilla L.
<i>Lasioglossum aberrans</i>	1	Oenothera L.
<i>Megachile fidelis</i>	20	Asteraceae: Chrysothamnus Nutt., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Machaeranthera Nees, Madia Molina, Plectrocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees, Verbesina L., Viguiera Kunth
<i>Megachile lapponica</i>	2	Chamaenerion Ség.
<i>Megachile melanophaea</i>	6	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L.
<i>Megachile mellitarsis</i>	5	Asteraceae: Chrysothamnus Nutt., Cirsium Mill., Encelia Adans., Grindelia Willd., Pluchea Cass., Senecio L.
<i>Megachile nevadensis</i>	22	Asteraceae: Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Senecio L., Solidago L., Symphyotrichum Nees
<i>Megachile parallela</i>	6	Asteraceae: Baccharis L., Bebbia (Benth.) Greene, Chrysothamnus Nutt., Coreopsis L., Corethrogyne DC., Deinandra Greene, Echinacea Moench, Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Hymenothrix A. Gray, Malacothrix DC., Palafoxia Lag., Plectrocephalus D.Don, Pyrrocoma Hook., Rudbeckia L., Senecio L., Solidago L., Stephanomeria Nutt., Tetraneuris Greene, Verbesina L., Wyethia Nutt.
<i>Megachile perihirta</i>	37	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	42	Asteraceae: Cirsium Mill.
<i>Megachile subnigra</i>	8	Asteraceae: Achillea L., Bebbia (Benth.) Greene, Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Eriophyllum Lag., Layia Hook. & Arn. ex DC., Senecio L.
<i>Megachile wheeleri</i>	20	Asteraceae: Achillea L., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Machaeranthera Nees,
<i>Melissodes agilis</i>	1	Asteraceae: Cirsium Mill., Grindelia Willd., Helianthus L., Ratibida Raf., Rudbeckia L., Simsia Pers., Solidago L., Verbesina L.

Table 13: Specialist bees present in the Eastern Cascades Slopes and Foothills ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Melissodes bimatrix</i>	1	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Machaeranthera Nees, Symphyotrichum Nees, Verbesina L.
<i>Melissodes lupinus</i>	29	Asteraceae: Bidens L., Centromadia Greene, Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Plectocephalus D.Don, Solidago L., Stephanomeria Nutt., Symphyotrichum Nees
<i>Melissodes microstictus</i>	47	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helenium L., Helianthus L., Heterotheca Cass., Plectocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees
<i>Melissodes rivalis</i>	2	Asteraceae: Brickellia Elliott, Cirsium Mill., Helianthus L., Plectocephalus D.Don
<i>Micralictoides ruficaudus</i>	2	Eschscholzia Cham.
<i>Osmia brevis</i>	97	Penstemon Schmidel
<i>Osmia californica</i>	142	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Cirsium Mill., Ericameria Nutt., Heliomeris Nutt., Heterotheca Cass., Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia coloradensis</i>	82	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia integra</i>	5	Fabaceae: Astragalus L., Lotus L., Lupinus L., Thermopsis R. Br.
<i>Osmia longula</i>	2	Fabaceae: Astragalus L., Hedysarum L., Lupinus L.
<i>Osmia montana</i>	283	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nigrifrons</i>	2	Fabaceae: Astragalus L., Lupinus L., Trifolium L.
<i>Osmia obliqua</i>	2	Fabaceae: Astragalus L., Lotus L., Trifolium L.
<i>Osmia regulina</i>	34	Fabaceae: Astragalus L., Trifolium L.
<i>Osmia ribifloris</i>	35	Ericaceae: Arctostaphylos Adans.
<i>Osmia subaustralis</i>	16	Asteraceae: Chaenactis DC., Cirsium Mill., Encelia Adans., Erigeron L., Grindelia Willd., Helianthus L., Heliomeris Nutt., Senecio L., Wyethia Nutt.
<i>Osmia texana</i>	10	Cirsium Mill.

Table 13: Specialist bees present in the Eastern Cascades Slopes and Foothills ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Perdita claypolei</i>	44	Eriogonum Michx.
<i>Perdita interrupta</i>	1	Eschscholzia Cham.
<i>Perdita nevadensis</i>	4	Eriogonum Michx.
<i>Perdita oregonensis</i>	22	Asteraceae: Chaenactis DC., Chrysothamnus Nutt., Encelia Adans., Ericameria Nutt., Geraea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag.
<i>Perdita zonalis</i>	186	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Eriogonum Michx., Gutierrezia Lag., Heterotheca Cass., Isocoma Nutt., Lepidospartum (A. Gray) A. Gray, Machaeranthera Nees, Solidago L., Symphyotrichum Nees



Figure 51: *Osmia brevis*, a specialist on *Penstemon* spp., an association listed in Table 13.

Klamath Mountains Ecoregion

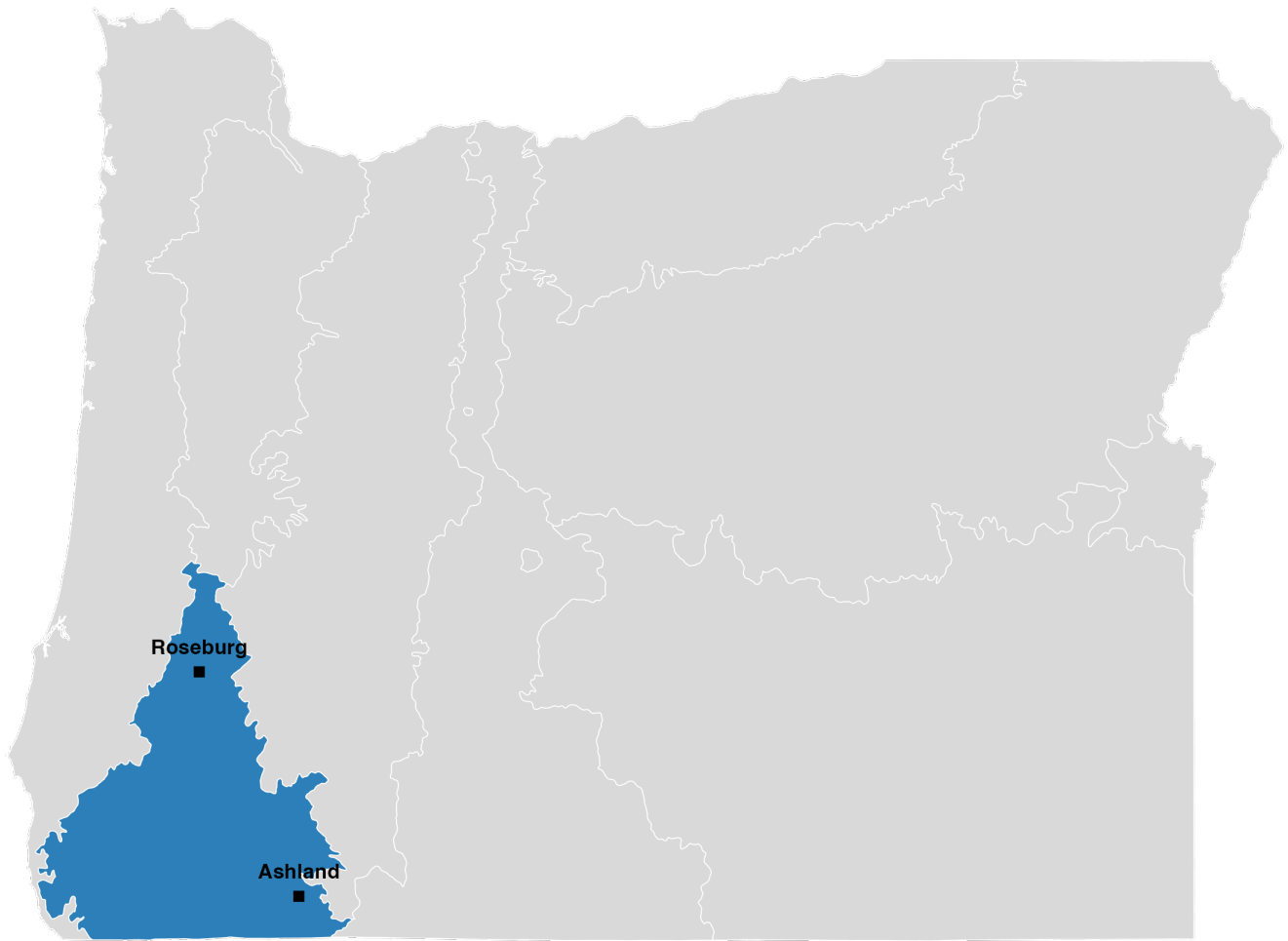


Figure 52: Level III Ecoregions of Oregon, with the Klamath Mountains and California High North Coast Range ecoregion highlighted.

The Klamath Mountains Ecoregion occupies the southwestern corner of Oregon between the Coast Range and Cascades ecoregions. The Ecoregion is defined by a mid-latitude Mediterranean climate with warm and dry summers with a long drought period, and relatively mild winters. Annual precipitation ranges from 20 inches to nearly 120 inches. The region is geologically diverse with sedimentary, intrusive, and volcanic rocks interspersed. Ultramafic rocks and serpentine soils are common in areas and host an unique flora. The region is highly biodiverse with temperate rainforests, pine and oak woodlands, grasslands, and small pockets of subalpine plant communities. There are a significant number of endemic plants in this Ecoregion, as well as plants more typical of the California flora. As a result, the Klamath Mountains is host to a high species richness of bees, including species reaching the northern limit of their range.

338

Bee Species
Recorded

630

Plant Species
Recorded

4643

Bee-Plant
Interactions



Ecoregion Summary Map

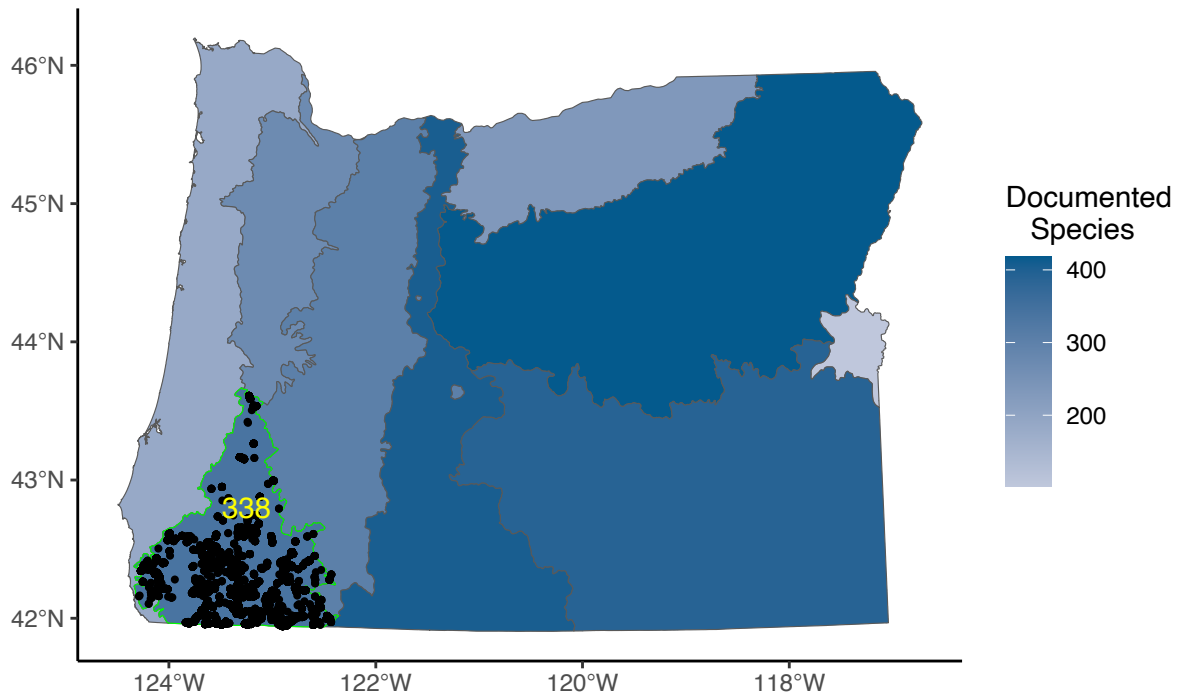


Figure 53: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Klamath Mountains Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Blue Mountains Ecoregion.

Top Plants For Bee Richness

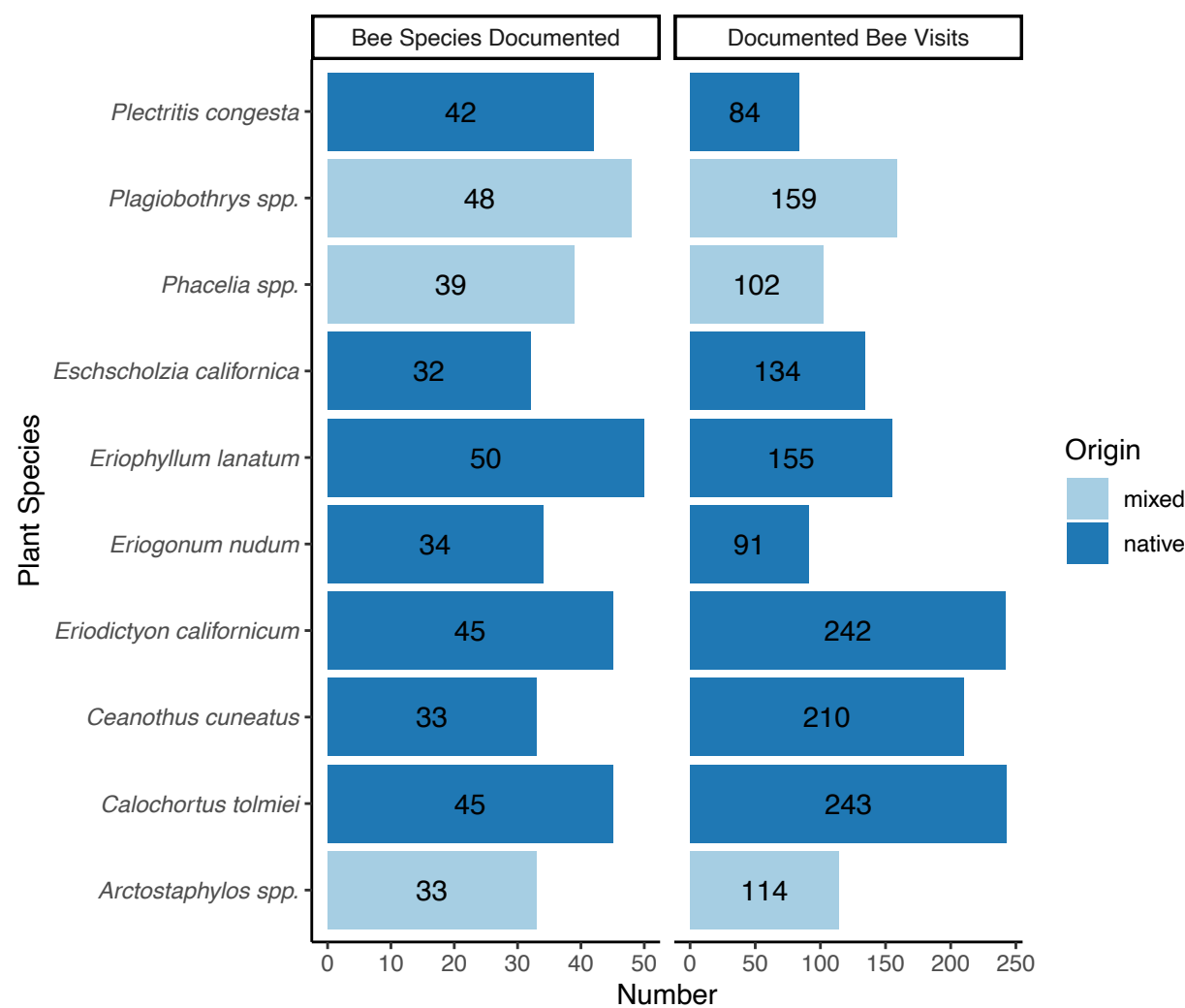


Figure 54: Top sampled plants for documented bee richness in the Klamath Mountains Ecoregion.

Top plants for bee richness, split by season

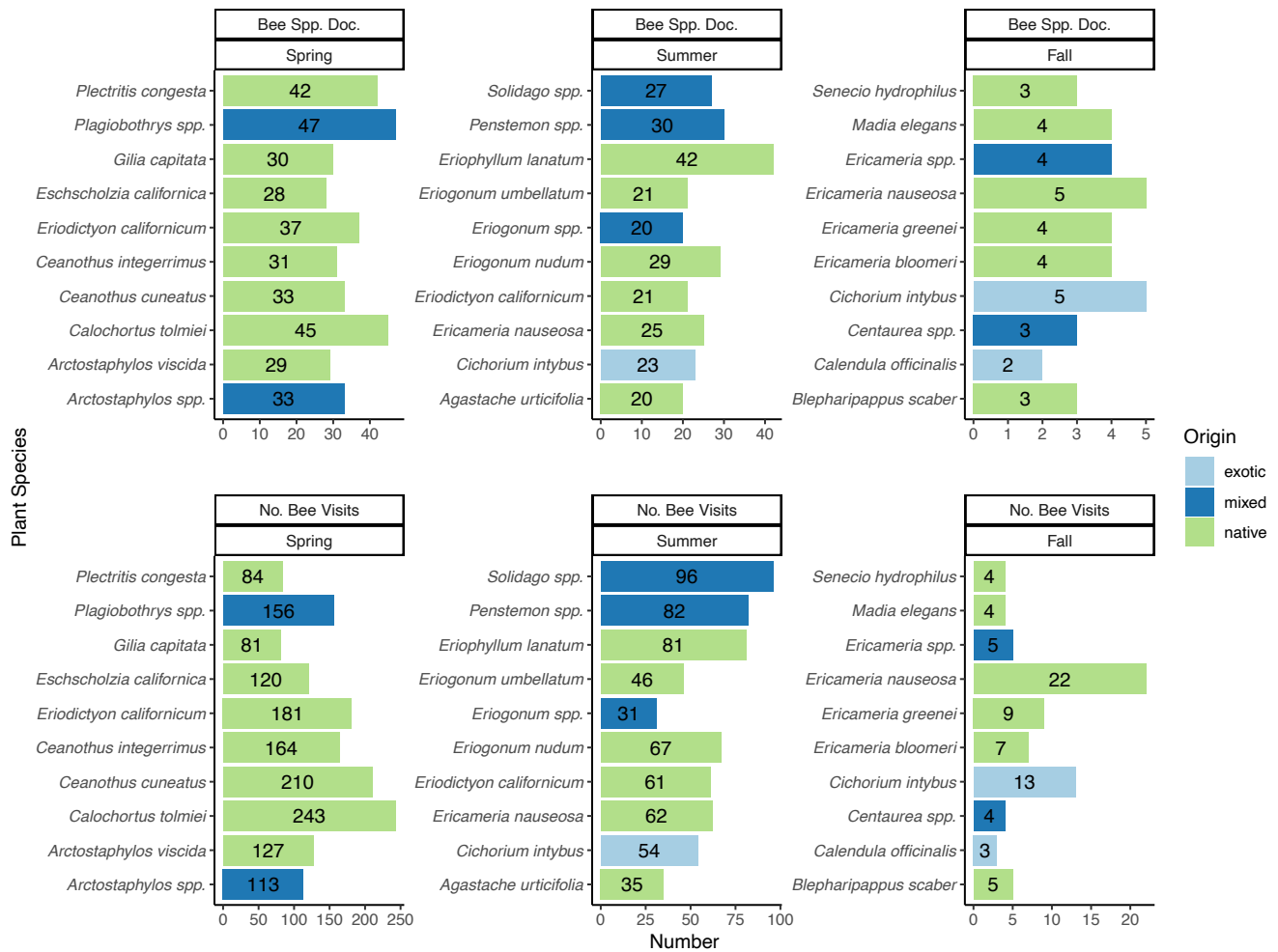


Figure 55: Top sampled plant species that support the most documented bee species by season in the Klamath Mountains Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Klamath Mountains/California High North Coast Range ecoregion

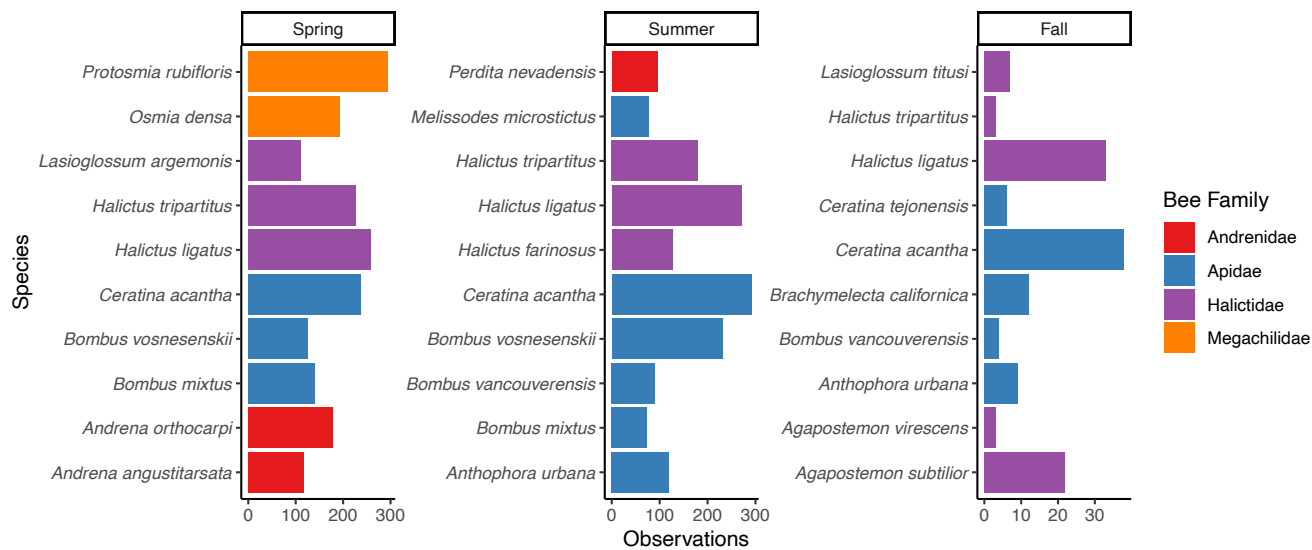


Figure 56: Most abundant bee species documented in the Klamath Mountains Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Klamath Mountains/California High North Coast Range ecoregion

Table 14: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Klamath Mountains Ecoregion.

Bee Species	Observations
<i>Andrena candidiformis</i>	1
<i>Andrena cerasifolii</i>	2
<i>Andrena hypoleuca</i>	2
<i>Andrena melanothroa</i>	1
<i>Andrena monogonoparia</i>	2
<i>Andrena proluxa</i>	2
<i>Andrena saccata</i>	1
<i>Anthidium illustre</i>	1
<i>Anthidium maculosum</i>	1
<i>Ashmeadiella altadenae</i>	4
<i>Biastes fulviventrtris</i>	3
<i>Ceratina dallatorreana</i>	1

Table 14: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Klamath Mountains Ecoregion.

Bee Species	Observations
<i>Coelioxys hirsutissimus</i>	1
<i>Coelioxys novomexicanus</i>	1
<i>Coelioxys serricaudatus</i>	5
<i>Colletes kincaidii</i>	1
<i>Dianthidium heterulkei</i>	1
<i>Dianthidium plenum</i>	1
<i>Dufourea bernardina</i>	5
<i>Hoplitis remotula</i>	8
<i>Hoplitis uvulalis</i>	3
<i>Lasioglossum colatum</i>	1
<i>Lasioglossum macoupinense</i>	2
<i>Lasioglossum marinense</i>	2
<i>Lasioglossum megastictum</i>	2
<i>Lasioglossum sequoiae</i>	11
<i>Megachile anograe</i>	6
<i>Osmia bella</i>	1
<i>Osmia cara</i>	8
<i>Osmia inermis</i>	1
<i>Osmia malina</i>	7
<i>Osmia melanopleura</i>	1
<i>Osmia nifoata</i>	1
<i>Sphecodes proshorus</i>	1
<i>Stelis monticola</i>	1
<i>Triepeolus californicus</i>	1

Known specialist bee species present in the Klamath Mountains/California High North Coast Range ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 15: Specialist bees present in the Klamath Mountains ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena astragali</i>	10	Zigadenus Michx. (Toxicoscordion Rydb.)
<i>Andrena birtwelli</i>	2	Potentilla L.
<i>Andrena caerulea</i>	45	Ranunculus L.
<i>Andrena candidiformis</i>	1	Ceanothus L., Lomatium Raf.
<i>Andrena cleodora</i>	3	Ceanothus L.
<i>Andrena cuneilabris</i>	8	Ranunculus L.
<i>Andrena evoluta</i>	39	Agoseris Raf.
<i>Andrena frigida</i>	2	Salix L.
<i>Andrena melanochoea</i>	1	Potentilla L.
<i>Andrena monogonoparia</i>	2	Arctostaphylos Adans.
<i>Andrena nothocalaidis</i>	3	Agoseris Raf.
<i>Andrena orthocarpus</i>	182	Lasthenia Cass.
<i>Andrena pensilis</i>	2	Lasthenia Cass.
<i>Andrena salicifloris</i>	7	Salix L.
<i>Andrena scutellinitens</i>	42	Asteraceae: Achillea L., Anaphalis DC., Eurybia (Cass.) Cass., Erigeron L., Senecio L., Solidago L.
<i>Andrena semipunctata</i>	3	Salix L.
<i>Andrena striatifrons</i>	9	Salix L.
<i>Andrena surda</i>	1	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Machaeranthera Nees, Solidago L.
<i>Anthidium mormonum</i>	1	Lotus L., Phacelia Juss.
<i>Anthidium utahense</i>	17	Fabaceae: Lotus L.
<i>Ashmeadiella buconis</i>	1	Asteraceae: Acamptopappus (A. Gray) A. Gray, Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Chrysothamnus Nutt., Coreopsis L., Echinacea Moench, Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Helianthus Nutt., Heterotheca Cass., Hymenoxys A. Gray, Isocoma Nutt., Lactuca L., Machaeranthera Nees, Pectis L., Pentstemon Nutt., Senecio L., Solidago L., Vancleavea Greene, Verbena L., Wyethia Nutt., Xanthoxys DC.
<i>Ashmeadiella cubiceps</i>	4	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Encelia Adans., Ericameria Nutt., Erigeron L., Helianthus Nutt., Hieracium L., Malacothrix DC.
<i>Atoposmia abjecta</i>	2	Penstemon Schmidel [Keckiella Straw?]
<i>Atoposmia copelandica</i>	2	Phacelia Juss.
<i>Atoposmia triodonta</i>	11	Penstemon Schmidel [Keckiella Straw?]

Table 15: Specialist bees present in the Klamath Mountains ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Calliopsis anthidius</i>	7	Trifolium L.
<i>Calliopsis edwardsii</i>	9	Horkelia Cham. & Schltld., Potentilla L.
<i>Calliopsis fracta</i>	40	Boraginaceae: Cryptantha Lehm. ex G. Don, Eriodictyon Benth., Nama L., Phacelia Juss.
<i>Calliopsis obscurella</i>	2	Eschscholzia Cham.
<i>Ceratina sequoiae</i>	12	Clarkia Pursh
<i>Chelostoma phaceliae</i>	1	Phacelia Juss.
<i>Colletes fulgidus</i>	33	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Diadasia angusticeps</i>	14	Clarkia Pursh
<i>Diadasia bituberculata</i>	28	Calystegia R. Br., Convolvulus L.
<i>Diadasia diminuta</i>	10	Malvaceae: Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Diadasia lutzi</i>	1	Malvaceae: Eremalche Greene, Sphaeralcea A. St.-Hil.
<i>Diadasia nigrifrons</i>	28	Malvaceae: Sidalcea A. Gray
<i>Dianthidium subparvum</i>	16	Asteraceae: Agoseris Raf., Chaenactis DC., Chrysanthamnus Nutt., Cirsium Mill., Corethrogyne DC., Encelia Adans., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Helimeris Nutt., Machaeranthera Nees, Pentachaeta Nutt., Palafoxia Lag., Pyrrocoma Hook., Solidago L., Stephanomeria Nutt., Viguiera Kunth
<i>Dianthidium ulkei</i>	10	Asteraceae: Achillea L., Baileya Harv. & A. Gray ex A. Gray, Chrysanthamnus Nutt., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Heterotheca Cass., Hulsea Torr. & A. Gray, Lessingia Cham., Machaeranthera Nees, Pentachaeta Nutt., Solidago L., Stephanomeria Nutt., Symphyotrichum Nees, Verbesina L.
<i>Dufourea calochorti</i>	44	Calochortus Pursh
<i>Dufourea holocyanea</i>	1	Symphoricarpos Duham.
<i>Dufourea trochantera</i>	4	Phacelia Juss.
<i>Eucera acerba</i>	4	Arctostaphylos Adans.
<i>Heriades cressoni</i>	2	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Machaeranthera Nees, Senecio L.
<i>Hoplitis remotula</i>	8	Cryptantha Lehm. ex G. Don

Table 15: Specialist bees present in the Klamath Mountains ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Hylaeus basalis</i>	10	Rosaceae: <i>Potentilla</i> L.
<i>Megachile fidelis</i>	28	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Coreopsis</i> L., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Gutierrezia</i> Lag., <i>Haplopappus</i> Cass., <i>Helenium</i> L., <i>Helianthus</i> L., <i>Hemizonia</i> DC., <i>Heterotheca</i> Cass., <i>Holocarpha</i> Greene, <i>Machaeranthera</i> Nees, <i>Madia</i> Molina, <i>Plectrocephalus</i> D.Don, <i>Rudbeckia</i> L., <i>Senecio</i> L., <i>Solidago</i> L., <i>Symphotrichum</i> Nees, <i>Verbesina</i> L., <i>Viguiera</i> Kunth
<i>Megachile gravita</i>	13	<i>Clarkia</i> Pursh
<i>Megachile lapponica</i>	1	<i>Chamaenerion</i> Ség.
<i>Megachile melanophaea</i>	4	Fabaceae: <i>Astragalus</i> L., <i>Hedysarum</i> L., <i>Lotus</i> L., <i>Lupinus</i> L.
<i>Megachile mellitarsis</i>	1	Asteraceae: <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Encelia</i> Adans., <i>Grindelia</i> Willd., <i>Pluchea</i> Cass., <i>Senecio</i> L.
<i>Megachile parallela</i>	1	Asteraceae: <i>Baccharis</i> L., <i>Bebbia</i> (Benth.) Greene, <i>Chrysothamnus</i> Nutt., <i>Coreopsis</i> L., <i>Corethrogyne</i> DC., <i>Deinandra</i> Greene, <i>Echinacea</i> Moench, <i>Ericameria</i> Nutt., <i>Gaillardia</i> Foug., <i>Grindelia</i> Willd., <i>Gutierrezia</i> Lag., <i>Haplopappus</i> Cass., <i>Helenium</i> L., <i>Helianthus</i> L., <i>Hemizonia</i> DC., <i>Heterotheca</i> Cass., <i>Hymenothrix</i> A. Gray, <i>Malacothrix</i> DC., <i>Palafoxia</i> Lag., <i>Plectrocephalus</i> D.Don, <i>Pyrrocoma</i> Hook., <i>Rudbeckia</i> L., <i>Senecio</i> L., <i>Solidago</i> L., <i>Stephanomeria</i> Nutt., <i>Tetranneuris</i> Greene, <i>Verbesina</i> L., <i>Wyethia</i> Nutt.
<i>Megachile perihirta</i>	17	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	7	Asteraceae: <i>Cirsium</i> Mill.
<i>Megachile subnigra</i>	8	Asteraceae: <i>Achillea</i> L., <i>Bebbia</i> (Benth.) Greene, <i>Chaenactis</i> DC., <i>Cirsium</i> Mill., <i>Coreopsis</i> L., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Eriophyllum</i> Lag., <i>Layia</i> Hook. & Arn. ex DC., <i>Senecio</i> L.
<i>Megachile wheeleri</i>	8	Asteraceae: <i>Achillea</i> L., <i>Chrysothamnus</i> Nutt., <i>Cirsium</i> Mill., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Machaeranthera</i> Nees,
<i>Melissodes lupinus</i>	20	Asteraceae: <i>Bidens</i> L., <i>Centromadia</i> Greene, <i>Cirsium</i> Mill., <i>Encelia</i> Adans., <i>Ericameria</i> Nutt., <i>Erigeron</i> L., <i>Grindelia</i> Willd., <i>Helianthus</i> L., <i>Hemizonia</i> DC., <i>Heterotheca</i> Cass., <i>Holocarpha</i> Greene, <i>Plectrocephalus</i> D.Don, <i>Solidago</i> L., <i>Stephanomeria</i> Nutt., <i>Symphotrichum</i> Nees

Table 15: Specialist bees present in the Klamath Mountains ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Melissodes microstictus</i>	78	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helenium L., Helianthus L., Heterotheca Cass., Plectrocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees
<i>Micralictoides ruficaudus</i>	46	Eschscholzia Cham.
<i>Osmia brevis</i>	17	Penstemon Schmidel
<i>Osmia californica</i>	11	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Cirsium Mill., Ericameria Nutt., Heliomeris Nutt., Heterotheca Cass., Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia coloradensis</i>	56	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia grinnelli</i>	4	Asteraceae: Chaenactis DC., Coreopsis L., Encelia Adans., Ericameria Nutt., Hulsea Torr. & A. Gray
<i>Osmia montana</i>	92	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nifoata</i>	1	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L., Trifolium L.
<i>Osmia nigrifrons</i>	6	Fabaceae: Astragalus L., Lupinus L., Trifolium L.
<i>Osmia regulina</i>	18	Fabaceae: Astragalus L., Trifolium L.
<i>Osmia ribifloris</i>	32	Ericaceae: Arctostaphylos Adans.
<i>Osmia subaustralis</i>	13	Asteraceae: Chaenactis DC., Cirsium Mill., Encelia Adans., Erigeron L., Grindelia Willd., Helianthus L., Heliomeris Nutt., Senecio L., Wyethia Nutt.
<i>Osmia texana</i>	3	Cirsium Mill.
<i>Peponapis pruinosa</i>	6	Cucurbita L.
<i>Perdita ciliata</i>	1	Asteraceae: Ericameria Nutt., Euthamia Nutt. ex Cass., Heterotheca Cass., Senecio L., Solidago L.
<i>Perdita claypolei</i>	10	Eriogonum Michx.
<i>Perdita interrupta</i>	43	Eschscholzia Cham.
<i>Perdita nevadensis</i>	107	Eriogonum Michx.
<i>Perdita oregonensis</i>	1	Asteraceae: Chaenactis DC., Chrysothamnus Nutt., Encelia Adans., Ericameria Nutt., Geraea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag.

Table 15: Specialist bees present in the Klamath Mountains ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Perdita salicis</i>	4	Salix L.
<i>Perdita zonalis</i>	3	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Eriogonum Michx., Gutierrezia Lag., Heterotheca Cass., Isocoma Nutt., Lepidospartum (A. Gray) A. Gray, Machaeranthera Nees, Solidago L., Symphyotrichum Nees



Figure 57: *Dufourea calochorti*, a specialist on *Calochortus* spp., and association listed in Table 15.

Northern Basin & Range Ecoregion

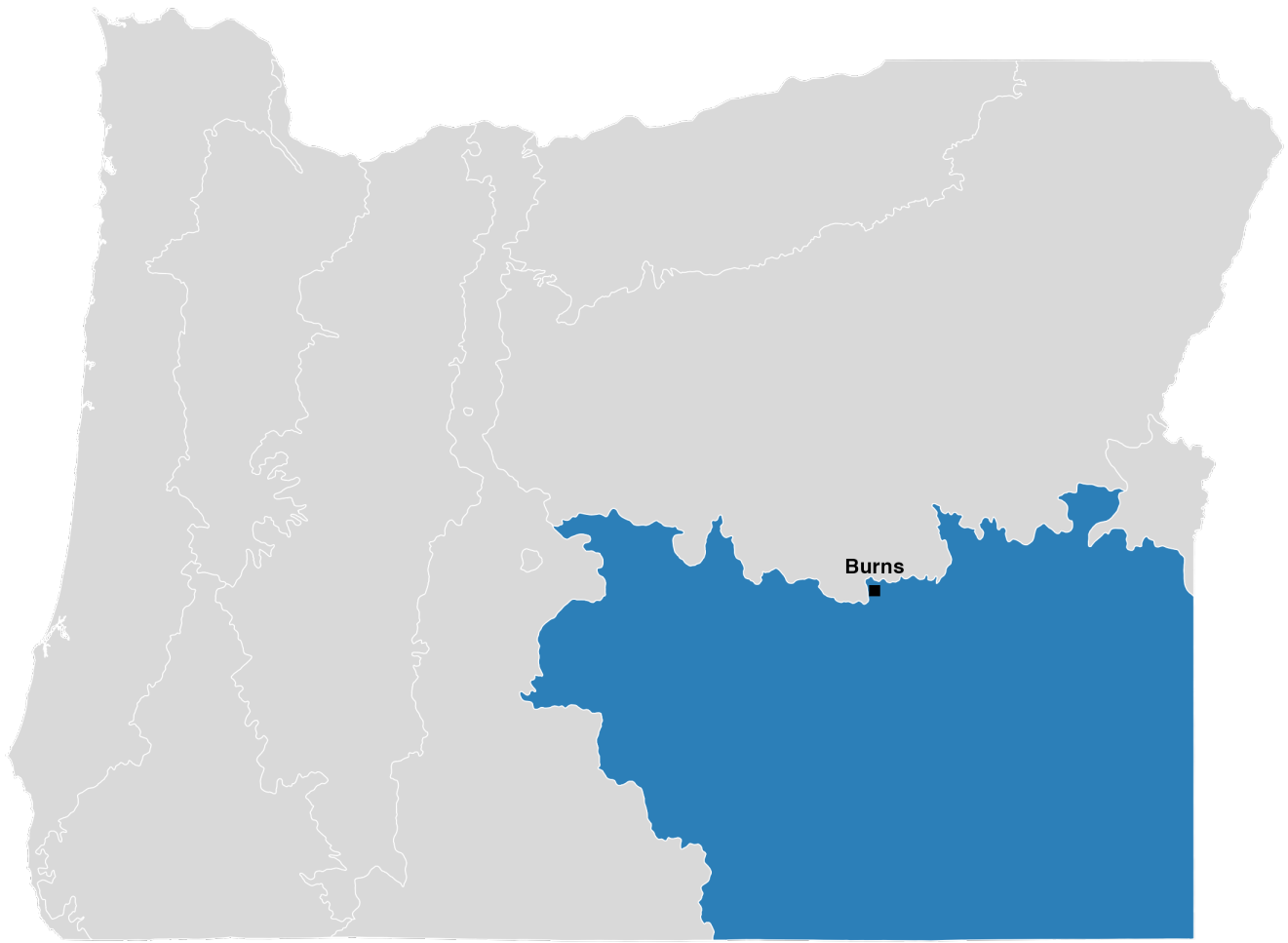


Figure 58: Level III Ecoregions of Oregon, with the Northern Basin and Range ecoregion highlighted.

The Northern Basin and Range Ecoregion represents the northern extent of the Great Basin and covers a large portion of southeastern Oregon. The ecoregion is defined by mid-latitude steppe and mid-latitude desert climates with hot summers and cold winters. Annual precipitation ranges from approximately 6 inches to 40 inches at some higher elevation locations. The geology is generally of volcanic origin and the region is notable for north-south trending fault block mountains and alkali lake basins. These contrasting habitats support subalpine and desert plant communities within miles of one another, supporting a biodiverse bee fauna with some of the state's most rarely detected species.

390

Bee Species
Recorded

357

Plant Species
Recorded

3106

Bee-Plant
Interactions



Ecoregion Summary Map

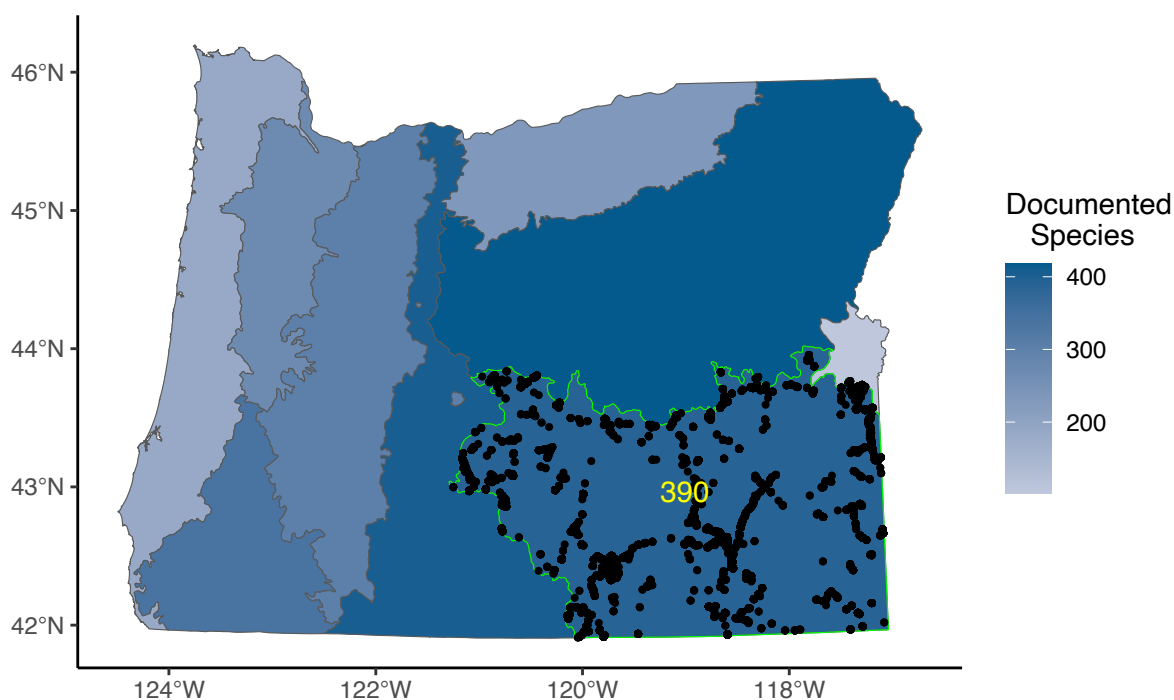


Figure 59: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Northern Basin and Range Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Northern Basin and Range Ecoregion.

Top Plants For Bee Richness

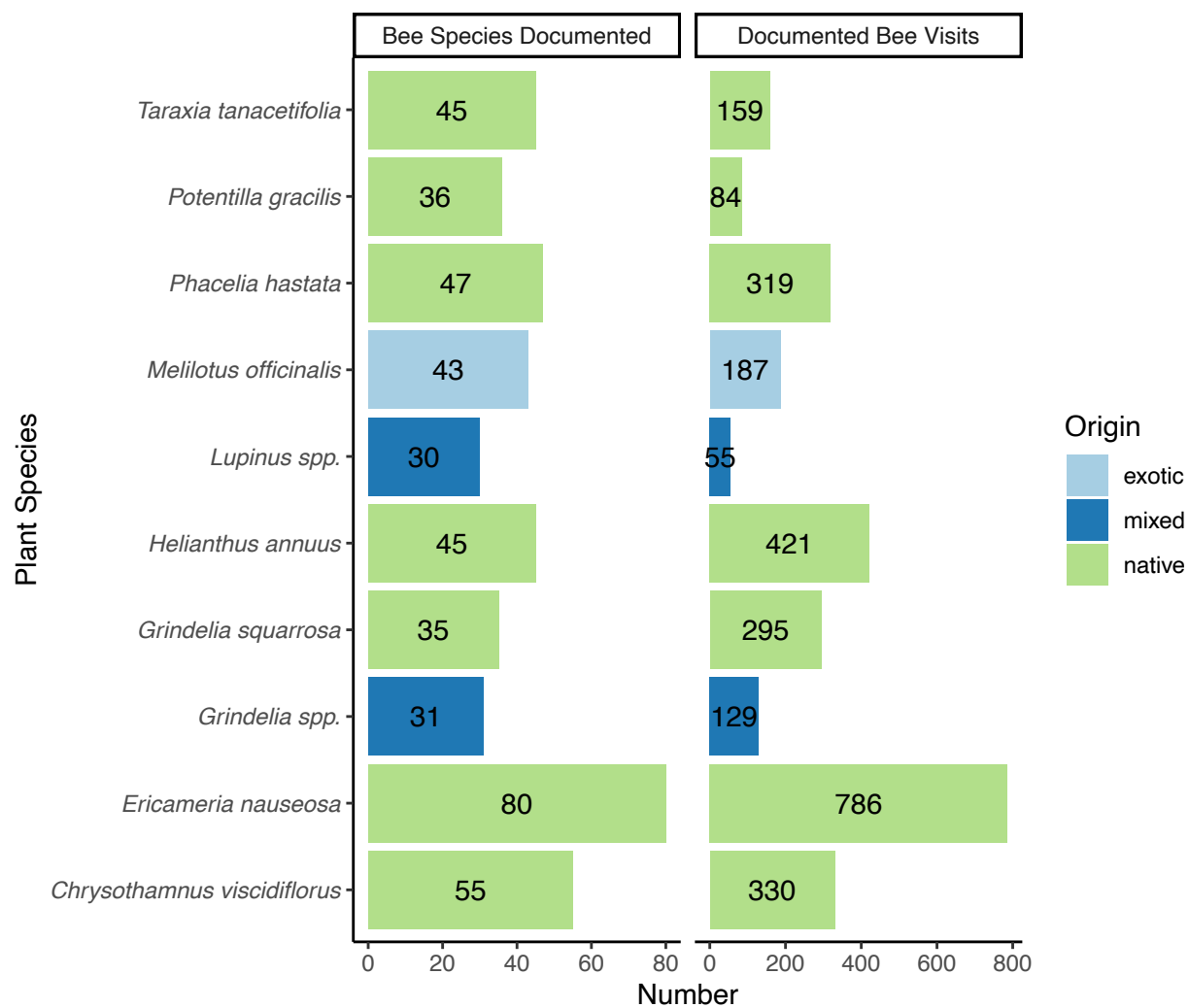


Figure 60: Top sampled plants for documented bee richness in the Northern Basin and Range Ecoregion.

Top plants for bee richness, split by season

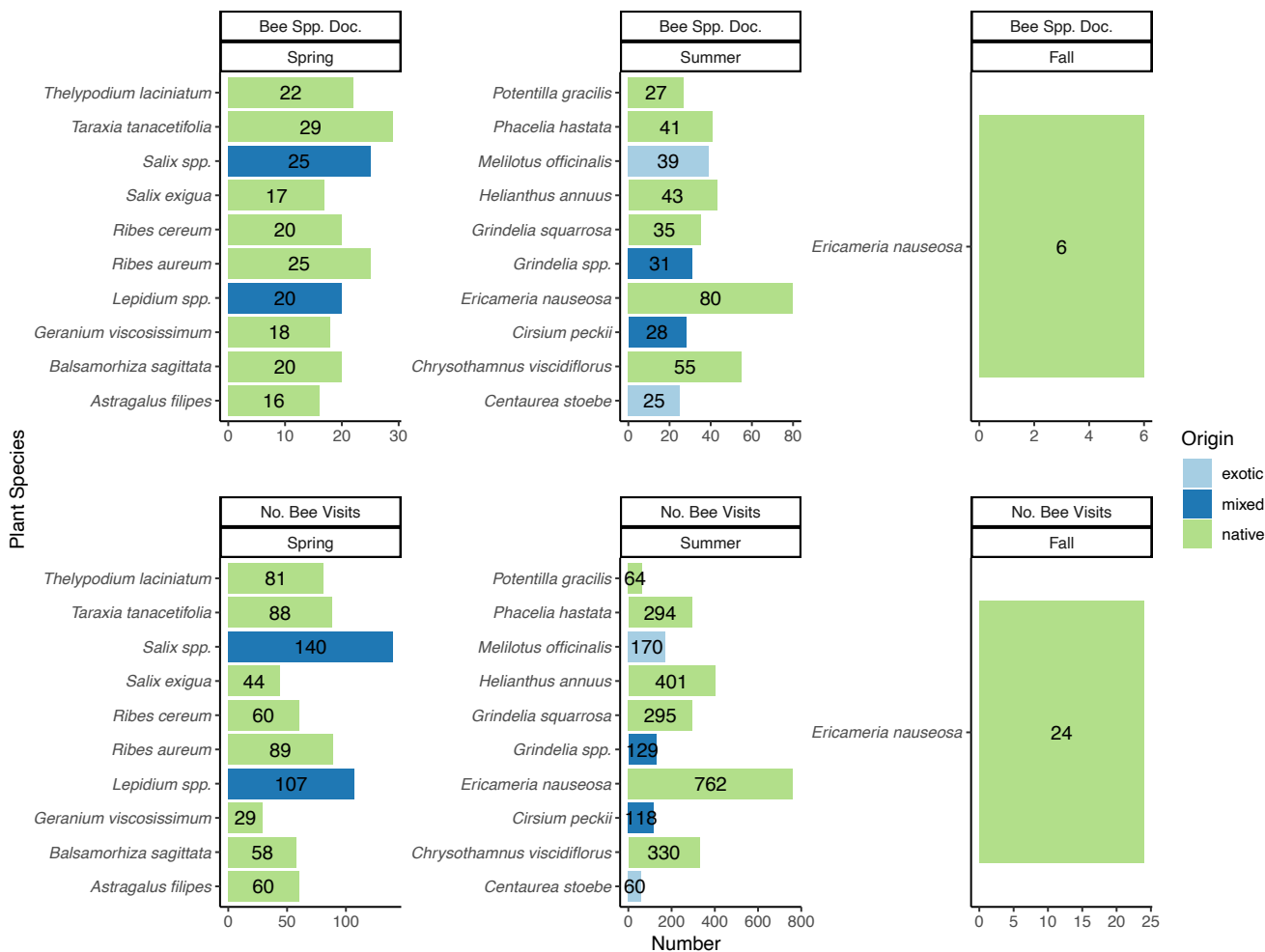


Figure 61: Top sampled plant species that support the most documented bee species by season in the Northern Basin and Range Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Northern Basin and Range ecoregion

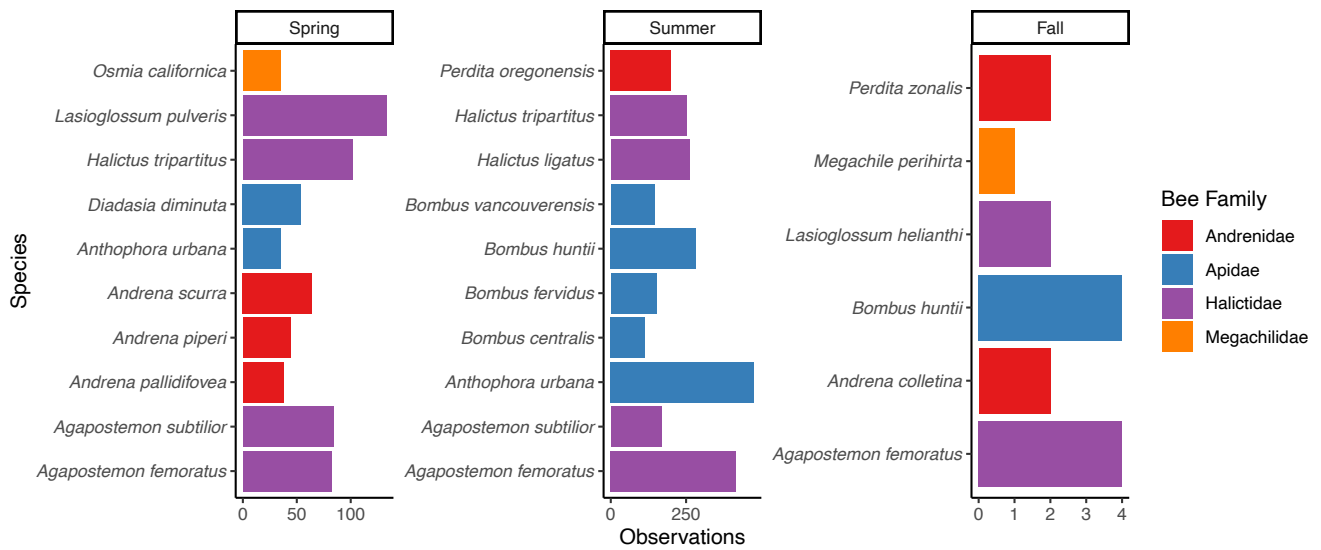


Figure 62: Most abundant bee species documented in the Northern Basin and Range Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Northern Basin and Range ecoregion

Table 16: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Northern Basin and Range Ecoregion.

Bee Species	Observations
<i>Andrena ablegata</i>	2
<i>Andrena cerasifolii</i>	1
<i>Andrena cheyennorum</i>	6
<i>Andrena cyanophila</i>	7
<i>Andrena laminibucca</i>	2
<i>Andrena medionitens</i>	6
<i>Andrena melanothroa</i>	3
<i>Andrena milwaukeeensis</i>	2
<i>Andrena nevadensis</i>	2
<i>Andrena schuhi</i>	2
<i>Andrena sladeni</i>	3
<i>Andrena transnigra</i>	3
<i>Andrena vulpicolor</i>	5
<i>Andrena walleyi</i>	2
<i>Anthidium atripes</i>	1

Table 16: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Northern Basin and Range Ecoregion.

Bee Species	Observations
<i>Anthidium emarginatum</i>	5
<i>Anthidium illustre</i>	2
<i>Anthidium tenuiflorae</i>	3
<i>Anthophora porterae</i>	1
<i>Ashmeadiella foveata</i>	1
<i>Ashmeadiella sculleni</i>	1
<i>Calliopsis coloradensis</i>	5
<i>Calliopsis scitula</i>	4
<i>Calliopsis solitaria</i>	3
<i>Chelostoma californicum</i>	2
<i>Coelioxys erysimi</i>	4
<i>Coelioxys novomexicanus</i>	1
<i>Colletes lutzi</i>	4
<i>Colletes simulans</i>	8
<i>Dianthidium heterulkei</i>	1
<i>Dianthidium platyurum</i>	4
<i>Dioxys aurifuscus</i>	2
<i>Dufourea fimbriata</i>	4
<i>Epeolus americanus</i>	2
<i>Epeolus novomexicanus</i>	1
<i>Eucera fulvitaris</i>	2
<i>Hoplitis paiute</i>	1
<i>Hoplitis plagiostoma</i>	2
<i>Lasioglossum abundipunctum</i>	2
<i>Lasioglossum colatum</i>	5
<i>Lasioglossum dashwoodi</i>	1
<i>Lasioglossum hyalinum</i>	5
<i>Lasioglossum novascotiae</i>	1
<i>Lasioglossum prasinogaster</i>	10
<i>Lasioglossum testaceum</i>	2
<i>Megachile cleomis</i>	1
<i>Megachile coquilletti</i>	4
<i>Megachile inermis</i>	4
<i>Melissodes dago</i>	5

Table 16: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Northern Basin and Range Ecoregion.

Bee Species	Observations
<i>Melissodes lustrus</i>	6
<i>Melissodes menuachus</i>	3
<i>Micralictoides linsleyi</i>	9
<i>Osmia enixa</i>	4
<i>Osmia marginipennis</i>	1
<i>Osmia melanopleura</i>	3
<i>Osmia nanula</i>	1
<i>Osmia raritatis</i>	1
<i>Protandrena renimaculata</i>	5
<i>Stelis ashmeadiellae</i>	1
<i>Stelis montana</i>	1
<i>Stelis submarginata</i>	1
<i>Triepeolus concavus</i>	1
<i>Triepeolus punctoclypeus</i>	1
<i>Triepeolus robustus</i>	1
<i>Triepeolus shoshone</i>	3
<i>Triepeolus texanus</i>	2

Known specialist bee species present in the Northern Basin and Range ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena ablegata</i>	2	Agoseris Raf.
<i>Andrena astragali</i>	5	Zigadenus Michx. (Toxicoscordion Rydb.)
<i>Andrena bendensis</i>	7	Asteraceae: Ericameria Nutt.
<i>Andrena birtwelli</i>	29	Potentilla L.
<i>Andrena cheyennorum</i>	6	Symphoricarpos Duham.
<i>Andrena cleodora</i>	3	Ceanothus L.

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena colletina</i>	16	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Andrena evoluta</i>	15	Agoseris Raf.
<i>Andrena frigida</i>	4	Salix L.
<i>Andrena illinoiensis</i>	12	Salix L.
<i>Andrena macoupinensis</i>	7	Salix L.
<i>Andrena melanochoa</i>	3	Potentilla L.
<i>Andrena microchlora</i>	7	Lomatium Raf.
<i>Andrena nevadensis</i>	2	Salix L.
<i>Andrena nothocalaidis</i>	12	Agoseris Raf.
<i>Andrena piperi</i>	44	Brassicaceae: Descurainia Webb & Bethel., Lepidium L., Lesquerella S. Watson, Physaria (Nutt. ex Torr. & A. Gray) A. Gray
<i>Andrena scurra</i>	86	Brassicaceae: Lepidium L., Lesquerella S. Watson
<i>Andrena striatifrons</i>	8	Salix L.
<i>Andrena subaustralis</i>	16	Salix L.
<i>Andrena sulcata</i>	14	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt.
<i>Andrena surda</i>	6	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Machaeranthera Nees, Solidago L.
<i>Andrena vulpicolor</i>	5	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Helianthus Nutt., Heterotheca Cass., Senecio L., Viguiera Kunth
<i>Anthidium atripes</i>	1	Fabaceae: Astragalus L., Lotus L.
<i>Anthidium emarginatum</i>	5	Phacelia Juss.
<i>Anthidium mormonum</i>	3	Lotus L., Phacelia Juss.
<i>Anthidium tenuiflorae</i>	3	Fabaceae: Astragalus L., Lotus L.
<i>Anthophora exigua</i>	88	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Haplopappus Cass., Orochaenactis Coville
<i>Anthophora maculifrons</i>	43	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Vancleavea Greene
<i>Anthophora porterae</i>	1	Astragalus L.

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Ashmeadiella buconis</i>	27	Asteraceae: Acamptopappus (A. Gray) A. Gray, Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Chrysothamnus Nutt., Coreopsis L., Echinacea Moench, Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Helianthus Nutt., Heterotheca Cass., Hymenoxys A. Gray, Isocoma Nutt., Lactuca L., Machaeranthera Nees, Pectis L., Pentachaeta Nutt., Senecio L., Solidago L., Vancleavea Greene, Verbesina L., Wyethia Nutt., Xanthisma DC.
<i>Ashmeadiella cubiceps</i>	10	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Encelia Adans., Ericameria Nutt., Erigeron L., Helianthus Nutt., Hieracium L., Malacothrix DC.
<i>Ashmeadiella timberlakei</i>	5	Fabaceae: Astragalus L., Lotus L., Lupinus L., Psoralea Rydb., Trifolium L.
<i>Atoposmia abjecta</i>	13	Penstemon Schmidel [Keckiella Straw?]
<i>Atoposmia copelandica</i>	19	Phacelia Juss.
<i>Calliopsis anthidioides</i>	1	Trifolium L.
<i>Calliopsis coloradensis</i>	5	Grindelia Willd.
<i>Calliopsis edwardsii</i>	37	Horkelia Cham. & Schltld., Potentilla L.
<i>Calliopsis obscurella</i>	4	Eschscholzia Cham.
<i>Calliopsis puellae</i>	14	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Calycoseris A. Gray, Chaenactis DC., Malacothrix DC.
<i>Ceratina sequoiae</i>	1	Clarkia Pursh
<i>Chelostoma californicum</i>	2	Phacelia Juss.
<i>Chelostoma phaceliae</i>	2	Phacelia Juss.
<i>Colletes compactus</i>	8	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Colletes consors</i>	9	Boraginaceae; Hydrophyllaceae
<i>Colletes fulgidus</i>	105	Asteraceae: Achillea L., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Colletes gypsicola</i>	62	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Verbesina L.
<i>Colletes simulans</i>	8	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Solidago L.
<i>Diadasia australis</i>	13	Cactaceae: Cylindropuntia (Engelm.) Kreuzinger, Echinocactus Link & Otto, Ferocactus Britton & Rose, Opuntia Mill.

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Diadasia bituberculata</i>	1	Calystegia R. Br., Convolvulus L.
<i>Diadasia consociata</i>	1	Malvaceae: Gossypium L., Sphaeralcea A. St.-Hil.
<i>Diadasia diminuta</i>	108	Malvaceae: Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Diadasia enavata</i>	109	Asteraceae: Helianthus L.
<i>Diadasia lutzi</i>	31	Malvaceae: Eremalche Greene, Sphaeralcea A. St.-Hil.
<i>Diadasia nigrifrons</i>	33	Malvaceae: Sidalcea A. Gray
<i>Diadasia nitidifrons</i>	2	Malvaceae: Iliamna Greene, Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Dianthidium curvatum</i>	27	Asteraceae: Coreopsis L., Grindelia Willd., Helenium L., Helianthus L.
<i>Dianthidium parvum</i>	6	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chrysanthamnus Nutt., Cirsium Mill., Corethrogyne DC., Encelia Adans., Erigeron L., Gaillardia Foug., Ger-aea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag., Heterotheca Cass., Lessingia Cham., Machaeranthera Nees, Stephanomeria Nutt.
<i>Dianthidium platyurum</i>	4	Asteraceae: Bebbia (Benth.) Greene, Erigeron L., Gutierrezia Lag., Heterotheca Cass., Lessingia Cham., Malacothrix DC., Pectis L., Senecio L., Stephanomeria Nutt.
<i>Dianthidium subparvum</i>	7	Asteraceae: Agoseris Raf., Chaenactis DC., Chrysanthamnus Nutt., Cirsium Mill., Corethrogyne DC., Encelia Adans., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Helimeris Nutt., Machaeranthera Nees, Pentachaeta Nutt., Palafoxia Lag., Pyrrocoma Hook., Solidago L., Stephanomeria Nutt., Viguiera Kunth
<i>Dianthidium ulkei</i>	14	Asteraceae: Achillea L., Baileya Harv. & A. Gray ex A. Gray, Chrysanthamnus Nutt., Cirsium Mill., Encelia Adans., Eri-cameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Heterotheca Cass., Hulsea Torr. & A. Gray, Lessingia Cham., Machaeranthera Nees, Pentachaeta Nutt., Solidago L., Stephanomeria Nutt., Symphyotrichum Nees, Verbesina L.
<i>Dufourea fimbriata</i>	4	Potentilla L.
<i>Dufourea trochantera</i>	29	Phacelia Juss.
<i>Hesperapis carinata</i>	2	Asteraceae: Helianthus L.
<i>Hylaeus basalis</i>	4	Rosaceae: Potentilla L.
<i>Lasioglossum aberrans</i>	53	Oenothera L.
<i>Lasioglossum lusorium</i>	18	Oenothera L.

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Megachile melanophaea</i>	1	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L.
<i>Megachile mellitarsis</i>	12	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Encelia Adans., Grindelia Willd., Pluchea Cass., Senecio L.
<i>Megachile nevadensis</i>	4	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Senecio L., Solidago L., Symphyotrichum Nees
<i>Megachile parallela</i>	110	Asteraceae: Baccharis L., Bebbia (Benth.) Greene, Chrysanthamnus Nutt., Coreopsis L., Corethrogyne DC., Deinandra Greene, Echinacea Moench, Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Hymenothrix A. Gray, Malacothrix DC., Palafoxia Lag., Plectrocephalus D.Don, Pyrrocoma Hook., Rudbeckia L., Senecio L., Solidago L., Stephanomeria Nutt., Tetraneuris Greene, Verbesina L., Wyethia Nutt.
<i>Megachile perihirta</i>	40	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	4	Asteraceae: Cirsium Mill.
<i>Megachile subnigra</i>	7	Asteraceae: Achillea L., Bebbia (Benth.) Greene, Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Eriophyllum Lag., Layia Hook. & Arn. ex DC., Senecio L.
<i>Megachile wheeleri</i>	8	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Machaeranthera Nees,
<i>Melissodes agilis</i>	22	Asteraceae: Cirsium Mill., Grindelia Willd., Helianthus L., Ratibida Raf., Rudbeckia L., Simsia Pers., Solidago L., Verbesina L.
<i>Melissodes bimatrix</i>	12	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Machaeranthera Nees, Symphyotrichum Nees, Verbesina L.
<i>Melissodes lupinus</i>	13	Asteraceae: Bidens L., Centromadia Greene, Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Plectrocephalus D.Don, Solidago L., Stephanomeria Nutt., Symphyotrichum Nees
<i>Melissodes lustrus</i>	6	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Grindelia Willd., Isocoma Nutt., Symphyotrichum Nees
<i>Melissodes menuachus</i>	3	Asteraceae: Grindelia Willd., Erigeron L., Helianthus L., Heterotheca Cass., Isocoma Nutt., Machaeranthera Nees, Solidago L., Symphyotrichum Nees, Verbesina L., Viguiera Kunth

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Melissodes microstictus</i>	9	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helenium L., Helianthus L., Heterotheca Cass., Plectocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees
<i>Melissodes rivalis</i>	5	Asteraceae: Brickellia Elliott, Cirsium Mill., Helianthus L., Plectocephalus D.Don
<i>Osmia brevis</i>	48	Penstemon Schmidel
<i>Osmia californica</i>	58	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Cirsium Mill., Ericameria Nutt., Heliomeris Nutt., Heterotheca Cass., Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia coloradensis</i>	11	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia grinnelli</i>	3	Asteraceae: Chaenactis DC., Coreopsis L., Encelia Adans., Ericameria Nutt., Hulsea Torr. & A. Gray
<i>Osmia integra</i>	8	Fabaceae: Astragalus L., Lotus L., Lupinus L., Thermopsis R. Br.
<i>Osmia longula</i>	6	Fabaceae: Astragalus L., Hedysarum L., Lupinus L.
<i>Osmia marginipennis</i>	1	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Layia Hook. & Arn. ex DC.
<i>Osmia montana</i>	13	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nigrifrons</i>	5	Fabaceae: Astragalus L., Lupinus L., Trifolium L.
<i>Osmia regulina</i>	31	Fabaceae: Astragalus L., Trifolium L.
<i>Osmia ribifloris</i>	1	Ericaceae: Arctostaphylos Adans.
<i>Osmia subaustralis</i>	2	Asteraceae: Chaenactis DC., Cirsium Mill., Encelia Adans., Erigeron L., Grindelia Willd., Helianthus L., Heliomeris Nutt., Senecio L., Wyethia Nutt.
<i>Osmia texana</i>	2	Cirsium Mill.
<i>Perdita adjuncta</i>	28	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt.
<i>Perdita aemula</i>	24	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt. ; Eriogonum Michx.
<i>Perdita albipennis</i>	16	Asteraceae: Chrysothamnus Nutt., Grindelia Willd., Helianthus L., Heterotheca Cass., Rudbeckia L., Symphyotrichum Nees, Verbesina L.

Table 17: Specialist bees present in the Northern Basin and Range ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Perdita claypolei</i>	1	Eriogonum Michx.
<i>Perdita lepidosparti</i>	81	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Lepidospartum (A. Gray) A. Gray, Tetradymia DC.
<i>Perdita nuttalliae</i>	2	Tiquilia Pers.
<i>Perdita oregonensis</i>	200	Asteraceae: Chaenactis DC., Chrysothamnus Nutt., Encelia Adans., Ericameria Nutt., Geraea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag.
<i>Perdita phymatae</i>	49	Asteraceae: Baileya Harv. & A. Gray ex A. Gray, Chrysothamnus Nutt., Ericameria Nutt., Gutierrezia Lag., Helianthus L.
<i>Perdita salicis</i>	8	Salix L.
<i>Perdita similis</i>	32	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Isocoma Nutt., Tetradymia DC.
<i>Perdita subfasciata</i>	56	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Gutierrezia Lag.
<i>Perdita zonalis</i>	73	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Eriogonum Michx., Gutierrezia Lag., Heterotheca Cass., Isocoma Nutt., Lepidospartum (A. Gray) A. Gray, Machaeranthera Nees, Solidago L., Symphyotrichum Nees

Snake River Plain Ecoregion

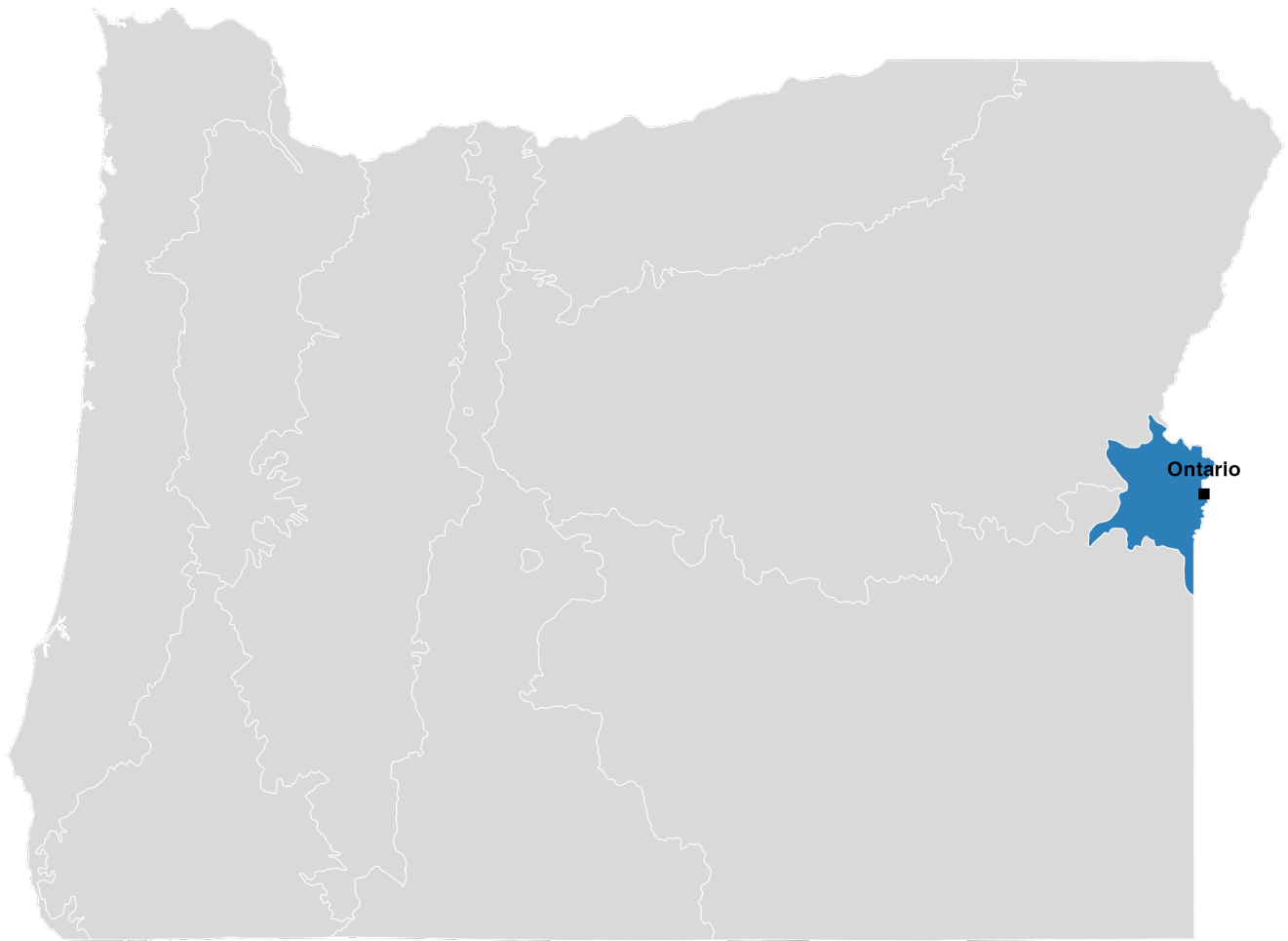


Figure 63: Level III Ecoregions of Oregon, with the Snake River Plain Ecoregion highlighted.

The Snake River Plain Ecoregion is located primarily in southern Idaho, stretching into a small portion of eastern Oregon around the town of Ontario. The ecoregion is defined by a mid-latitude steppe climate with warm summers and cold winters. Annual precipitation ranges from approximately 4 inches to 25 inches. The geology is volcanic in origin and the region is characterized by low rolling hills, alluvial valleys, and plains. Sagebrush steppe vegetation communities are dominant outside of areas converted for agriculture or urbanization. The region hosts many uncommon bee species that are at the western edge of their range.

102

Bee Species
Recorded

51

Plant Species
Recorded

260

Bee-Plant
Interactions



Ecoregion Summary Map

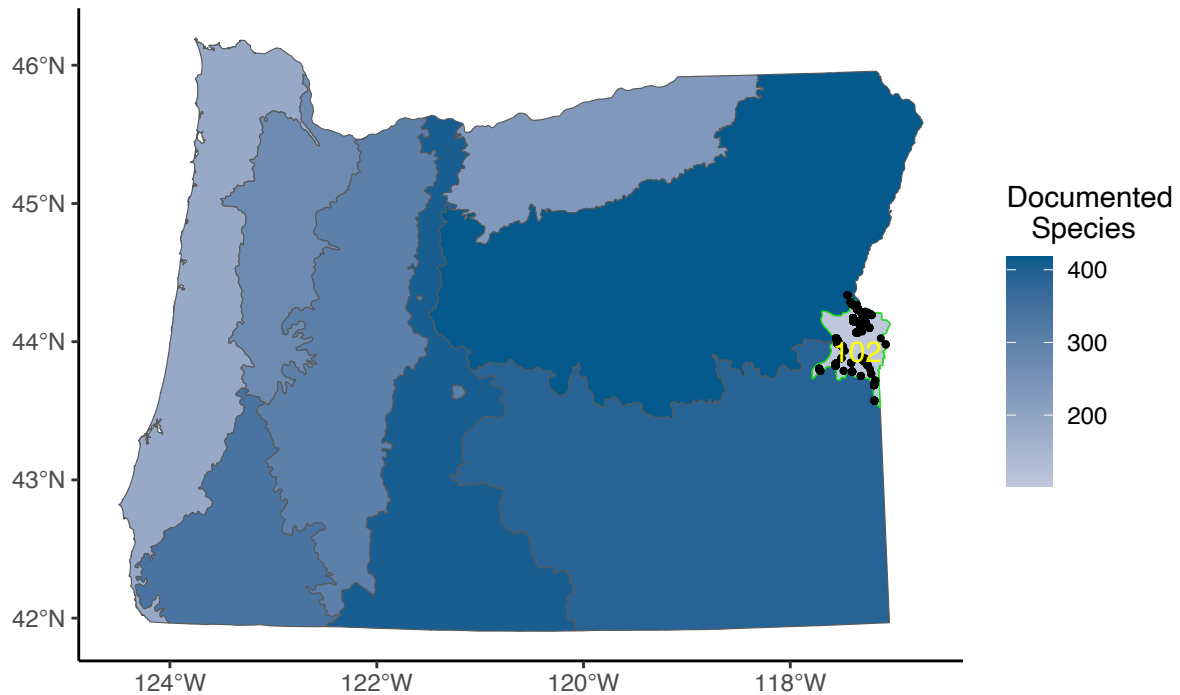


Figure 64: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Snake River Plain Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Snake River Plain Ecoregion.

Top Plants For Bee Richness

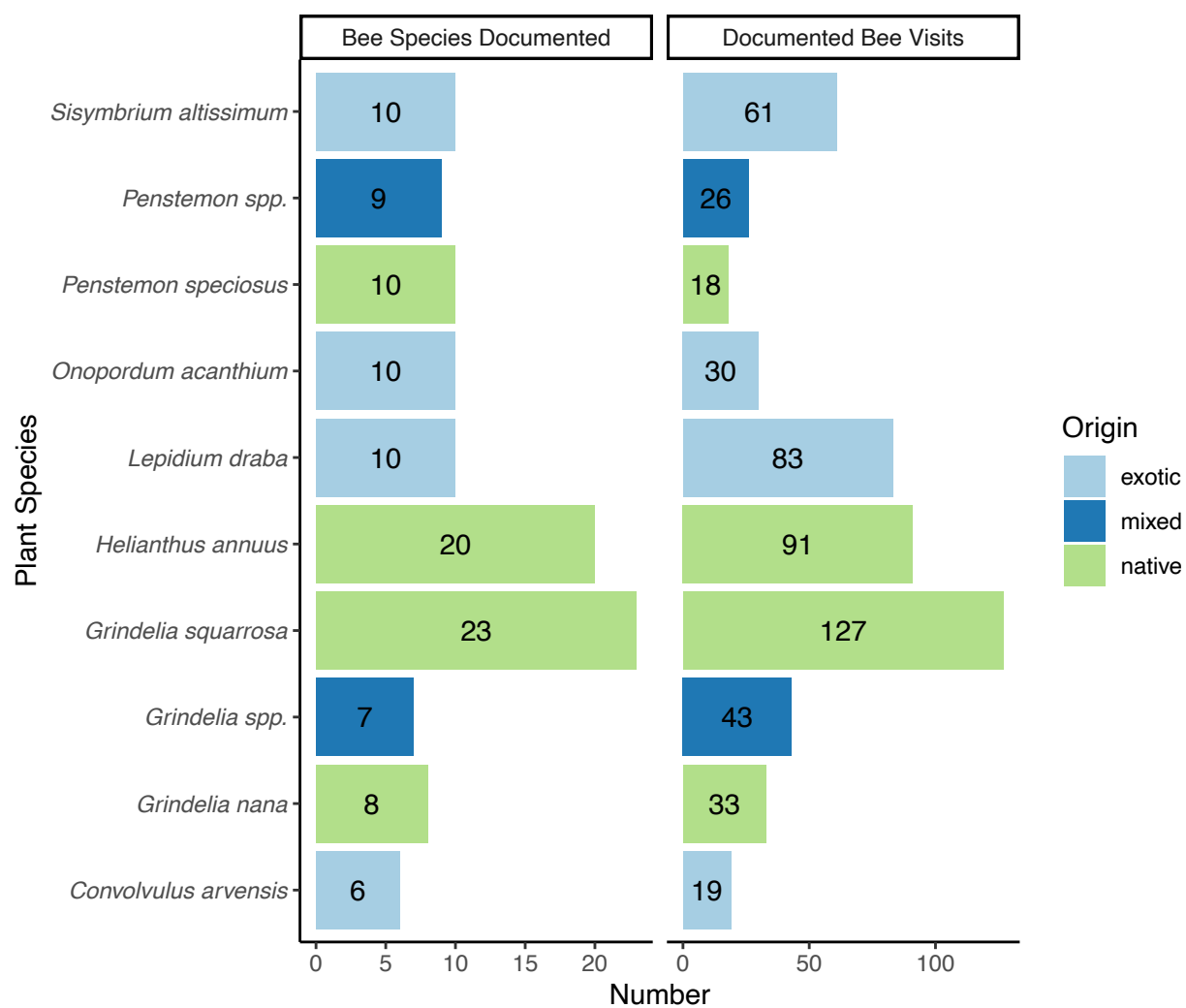


Figure 65: Top sampled plants for documented bee richness in the Snake River Plain Ecoregion.

Top plants for bee richness, split by season

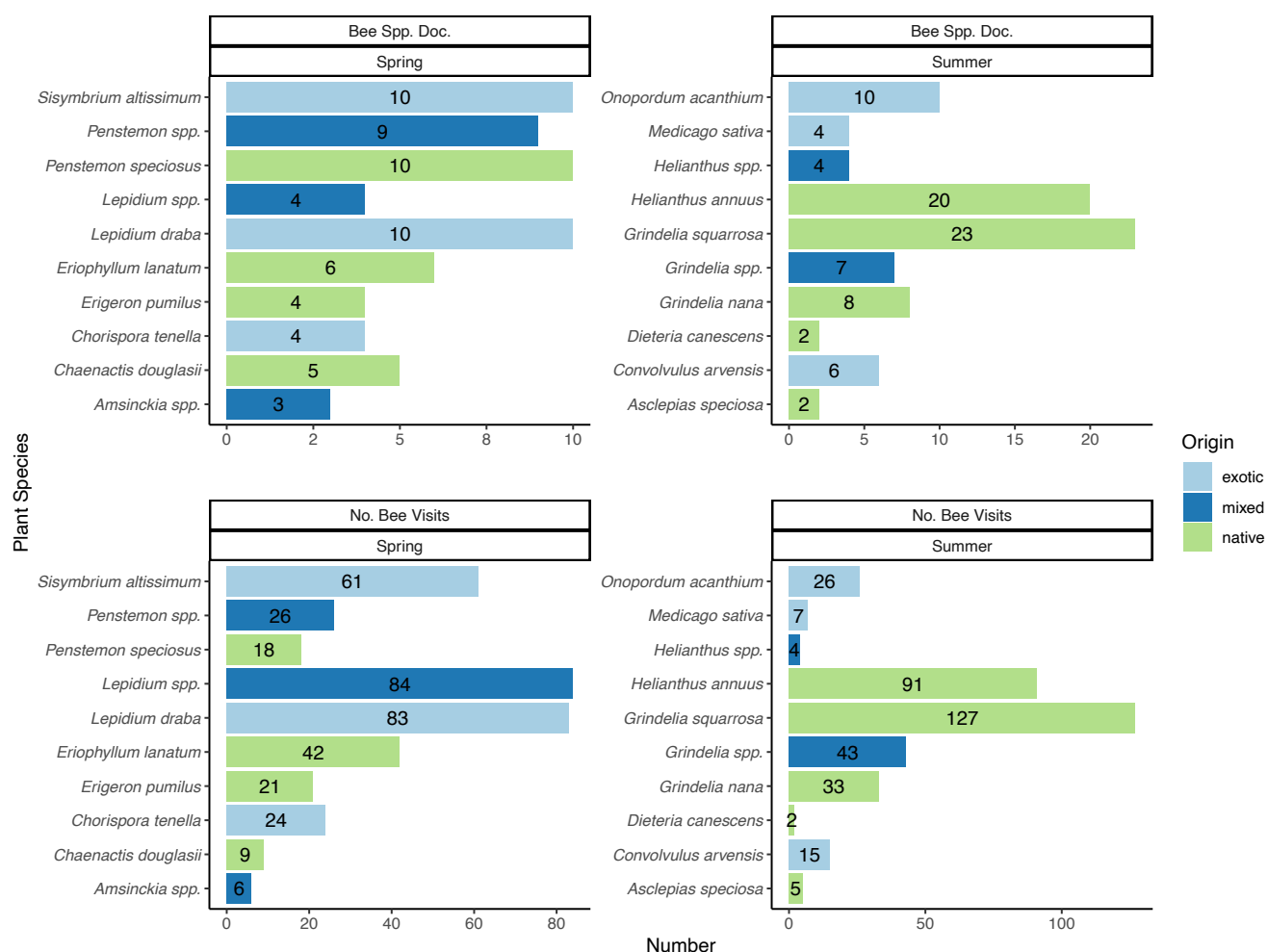


Figure 66: Top sampled plant species that support the most documented bee species by season in the Snake River Plain Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Snake River Plain ecoregion

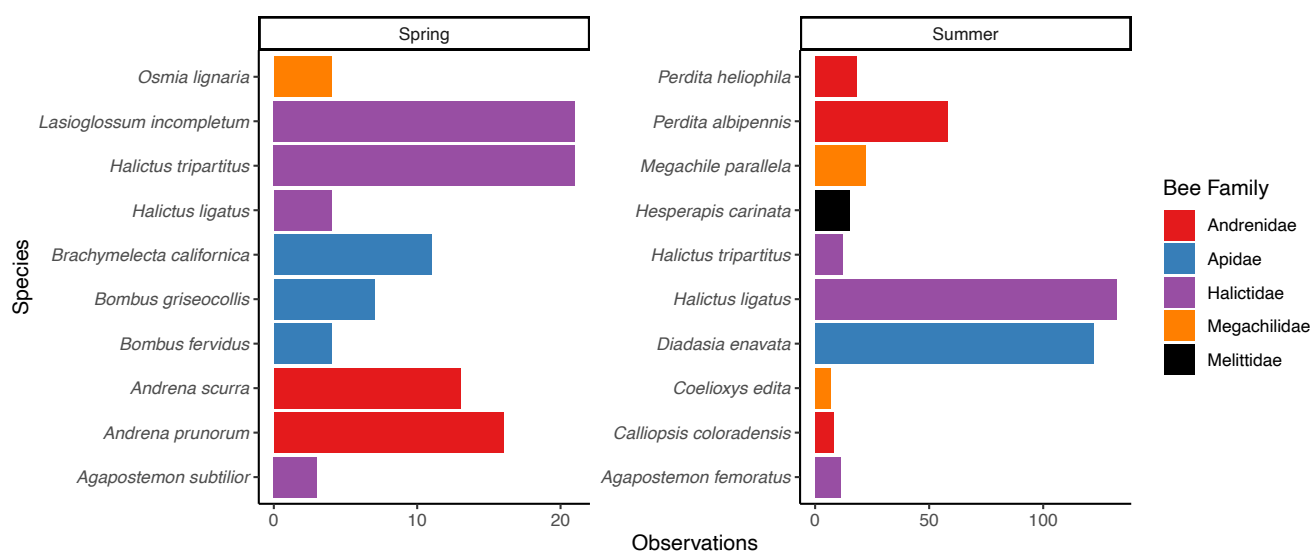


Figure 67: Most abundant bee species documented in the Snake River Plain Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Snake River Plain ecoregion

Table 18: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Snake River Plain Ecoregion.

Bee Species	Observations
<i>Calliopsis coloradensis</i>	8
<i>Eucera fulvitaris</i>	3
<i>Megachile inimica</i>	2
<i>Triepeolus concavus</i>	4
<i>Triepeolus helianthi</i>	2

Known specialist bee species present in the Snake River Plain ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 19: Specialist bees present in the Snake River Plain ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena astragali</i>	2	Zigadenus Michx. (Toxicoscordion Rydb.)
<i>Andrena scurra</i>	13	Brassicaceae: Lepidium L., Lesquerella S. Watson
<i>Ashmeadiella buconis</i>	4	Asteraceae: Acamptopappus (A. Gray) A. Gray, Baileya Harv. & A. Gray ex A. Gray, Chaenactis DC., Chrysothamnus Nutt., Coreopsis L., Echinacea Moench, Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Helionis Nutt., Heterotheca Cass., Hymenothrix A. Gray, Isocoma Nutt., Lactuca L., Machaeranthera Nees, Pectis L., Pentachaeta Nutt., Senecio L., Solidago L., Vancleavea Greene, Verbesina L., Wyethia Nutt., Xanthisma DC.
<i>Calliopsis coloradensis</i>	8	Grindelia Willd.
<i>Colletes gypsicolens</i>	1	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Verbesina L.
<i>Diadasia australis</i>	3	Cactaceae: Cylindropuntia (Engelm.) Kreuzinger, Echinocactus Link & Otto, Ferocactus Britton & Rose, Opuntia Mill.
<i>Diadasia diminuta</i>	9	Malvaceae: Sidalcea A. Gray, Sphaeralcea A. St.-Hil.
<i>Diadasia enavata</i>	122	Asteraceae: Helianthus L.
<i>Dianthidium curvatum</i>	5	Asteraceae: Coreopsis L., Grindelia Willd., Helenium L., Helianthus L.
<i>Dianthidium ulkei</i>	3	Asteraceae: Achillea L., Baileya Harv. & A. Gray ex A. Gray, Chrysothamnus Nutt., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Heterotheca Cass., Hulsea Torr. & A. Gray, Lessingia Cham., Machaeranthera Nees, Pentachaeta Nutt., Solidago L., Stephanomeria Nutt., Symphyotrichum Nees, Verbesina L.
<i>Hesperapis carinata</i>	15	Asteraceae: Helianthus L.
<i>Megachile inimica</i>	2	Asteraceae: Encelia Adans., Helianthus L.
<i>Megachile mellitarsis</i>	1	Asteraceae: Chrysothamnus Nutt., Cirsium Mill., Encelia Adans., Grindelia Willd., Pluchea Cass., Senecio L.

Table 19: Specialist bees present in the Snake River Plain ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Megachile parallela</i>	22	Asteraceae: Baccharis L., Bebbia (Benth.) Greene, Chrysothamnus Nutt., Coreopsis L., Corethrogyne DC., Deinandra Greene, Echinacea Moench, Ericameria Nutt., Gaillardia Foug., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Hymenothrix A. Gray, Malacothrix DC., Palafoxia Lag., Plectrocephalus D.Don, Pyrrocoma Hook., Rudbeckia L., Senecio L., Solidago L., Stephanomeria Nutt., Tetraneuris Greene, Verbesina L., Wyethia Nutt.
<i>Osmia grinnelli</i>	1	Asteraceae: Chaenactis DC., Coreopsis L., Encelia Adans., Ericameria Nutt., Hulsea Torr. & A. Gray
<i>Osmia integra</i>	2	Fabaceae: Astragalus L., Lotus L., Lupinus L., Thermopsis R. Br.
<i>Perdita aemula</i>	7	Asteraceae: Chrysothamnus Nutt., Ericameria Nutt. ; Eriogonum Michx.
<i>Perdita albipennis</i>	58	Asteraceae: Chrysothamnus Nutt., Grindelia Willd., Helianthus L., Heterotheca Cass., Rudbeckia L., Symphyotrichum Nees, Verbesina L.
<i>Perdita heliophila</i>	18	Asteraceae: Helianthus L.
<i>Perdita oregonensis</i>	3	Asteraceae: Chaenactis DC., Chrysothamnus Nutt., Encelia Adans., Ericameria Nutt., Geraea Torr. & A. Gray, Grindelia Willd., Gutierrezia Lag.

Willamette Valley Ecoregion

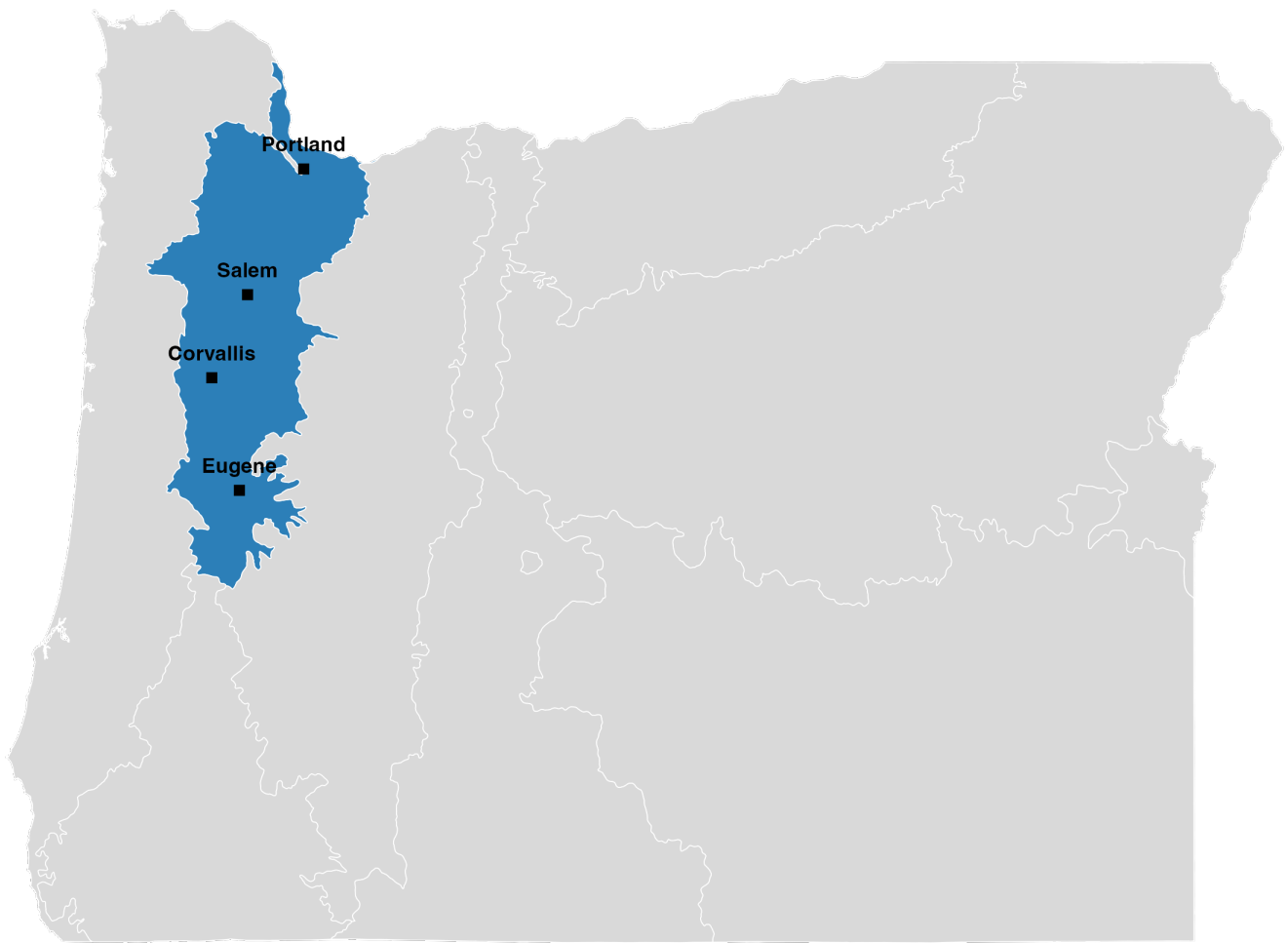


Figure 68: Level III Ecoregions of Oregon, with the Willamette Valley Ecoregion highlighted.

The Willamette Valley Ecoregion is situated between the Coast Range to the west and the Cascades to the east, and bounded by the Columbia River at its northern extent. The region is defined by a Mediterranean-type climate with dry summers and wet, temperate winters, with annual precipitation ranging from 32 inches to 63 inches. The Willamette Valley is the most densely populated region in Oregon and the majority of the lowlands has been converted to agriculture or urban development. The expansive valley was formerly dominated by oak-prairie habitats, however these native vegetation communities are now most commonly found on the surrounding foothills and scattered volcanic buttes. The significant rates of land conversion have resulted in highly altered vegetation communities, and the Willamette Valley is home to more than 700 exotic plant species. This is reflected in the data produced through the Oregon Bee Atlas, with many bees collected from exotic plants. Despite the highly altered ecology in the region, over 250 bee species have been recorded. Many of these are common species, however the region is home to a variety of relatively rare specialist bees.

271

Bee Species
Recorded

870

Plant Species
Recorded

7592

Bee-Plant
Interactions



Ecoregion Summary Map

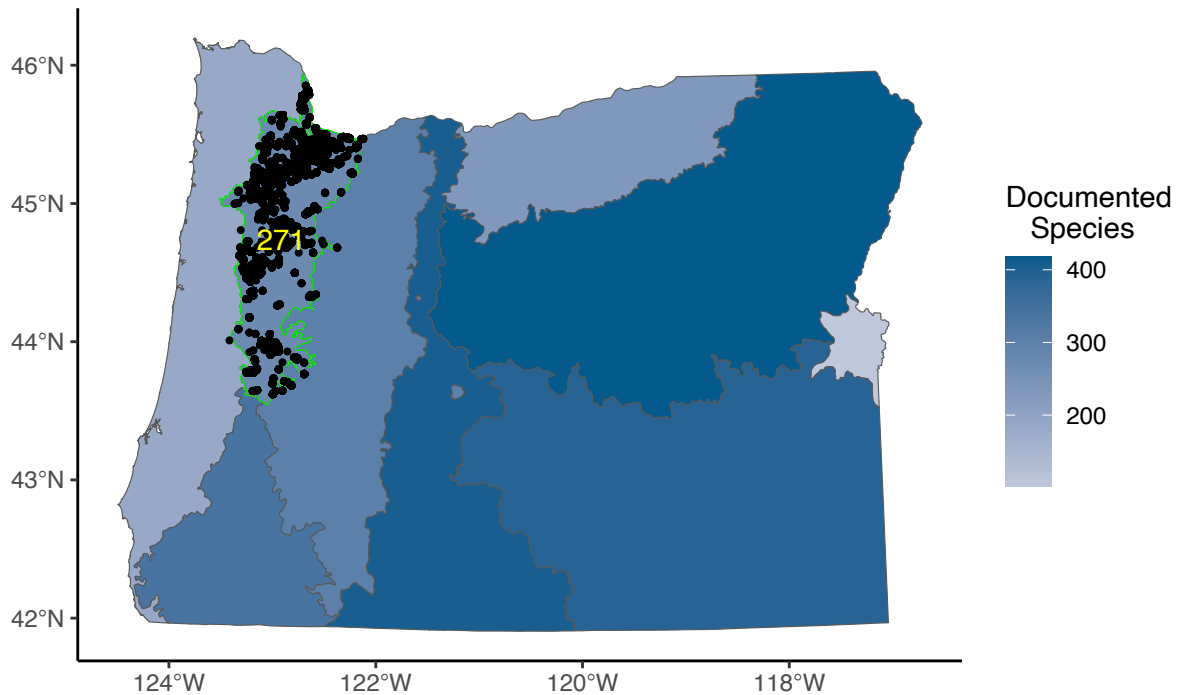


Figure 69: Choropleth of documented bee species richness for Level III Ecoregions in Oregon with the Willamette Valley Ecoregion outlined. Dots on the map represent the locations of all sampling localities within the Willamette Valley Ecoregion.

Top Plants For Bee Richness

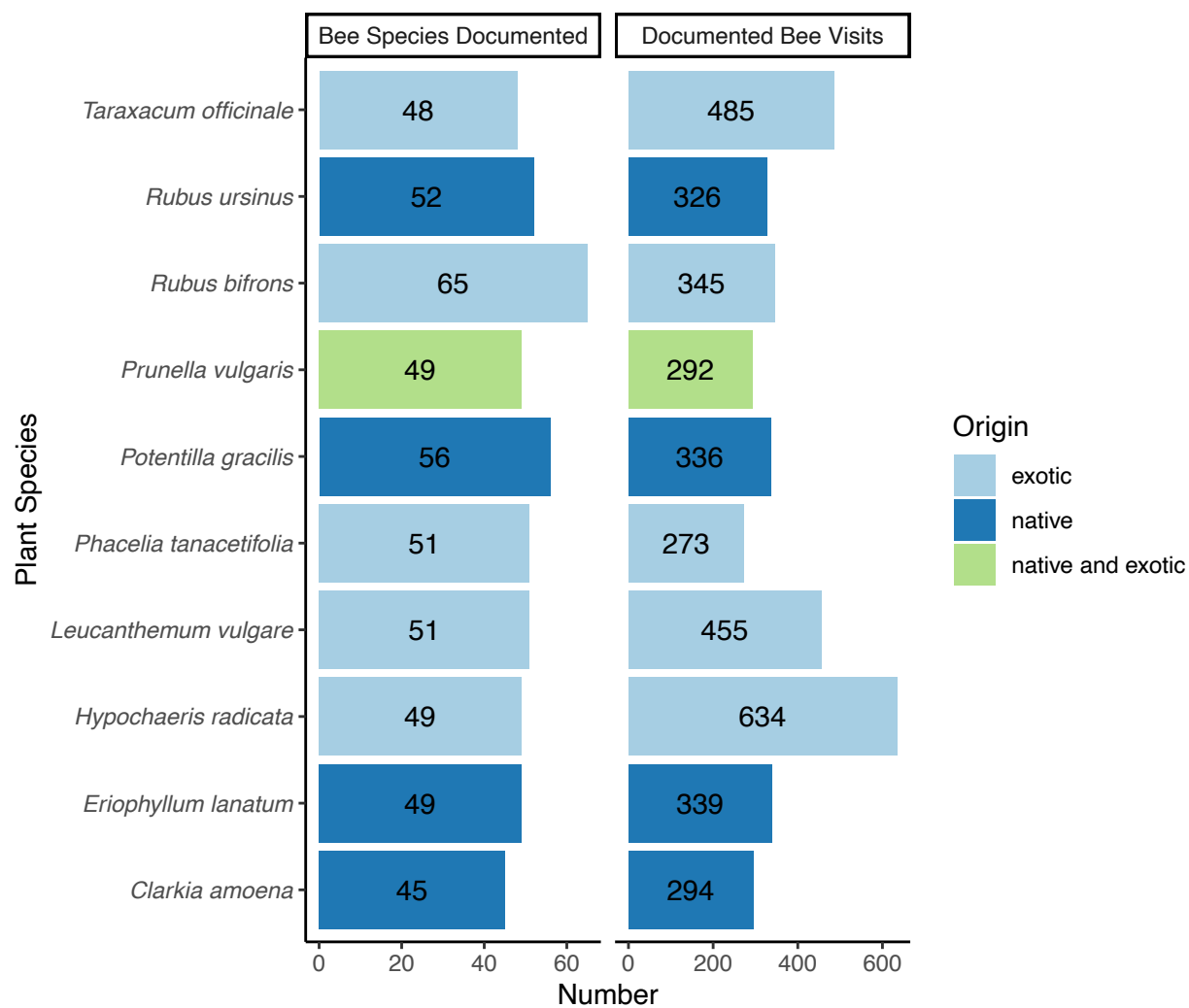


Figure 70: Top sampled plants for documented bee richness in the Willamette Valley Ecoregion.

Top plants for bee richness, split by season

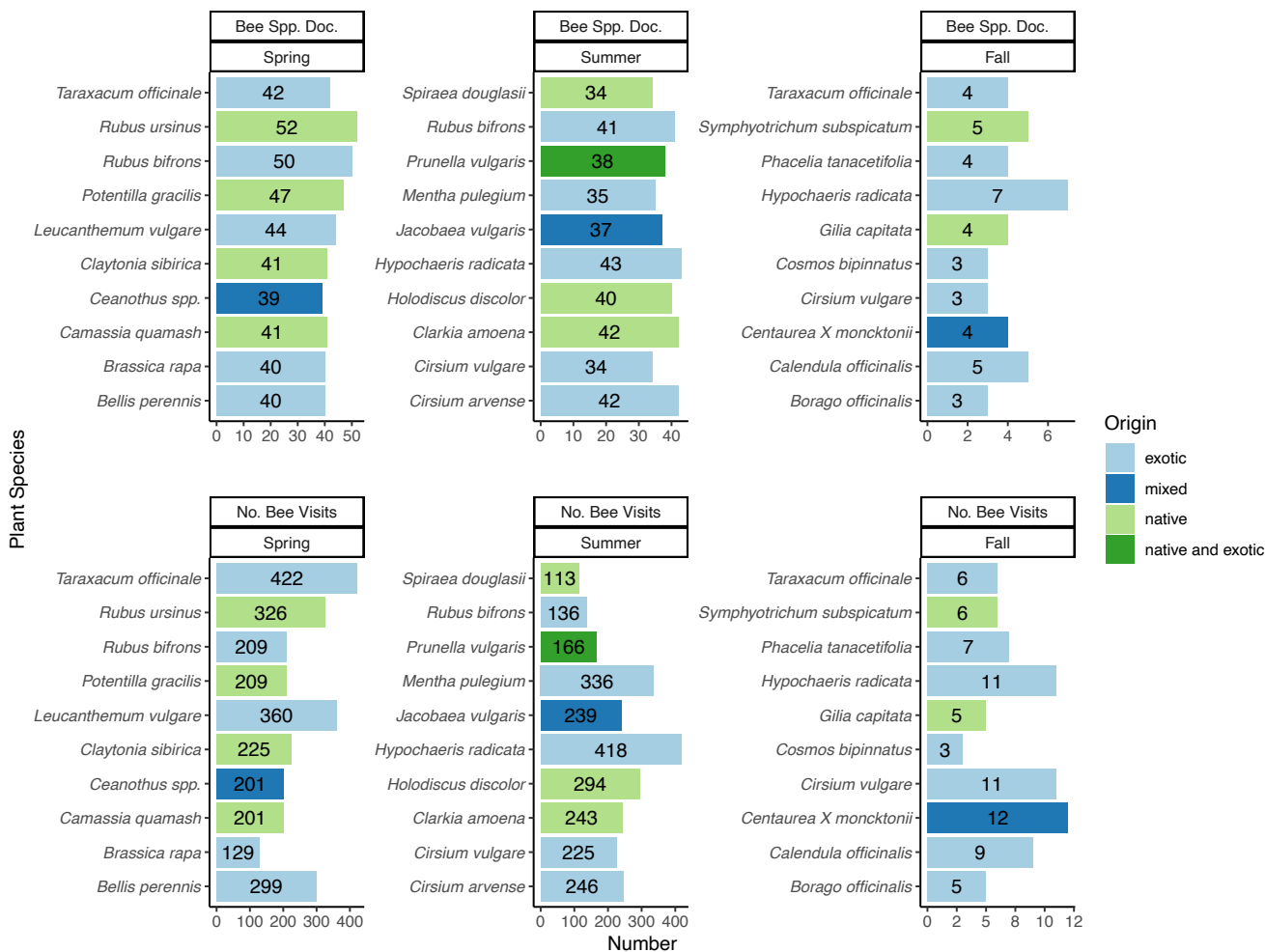


Figure 71: Top sampled plant species that support the most documented bee species by season in the Willamette Valley Ecoregion. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Most abundant bee species of the Willamette Valley ecoregion

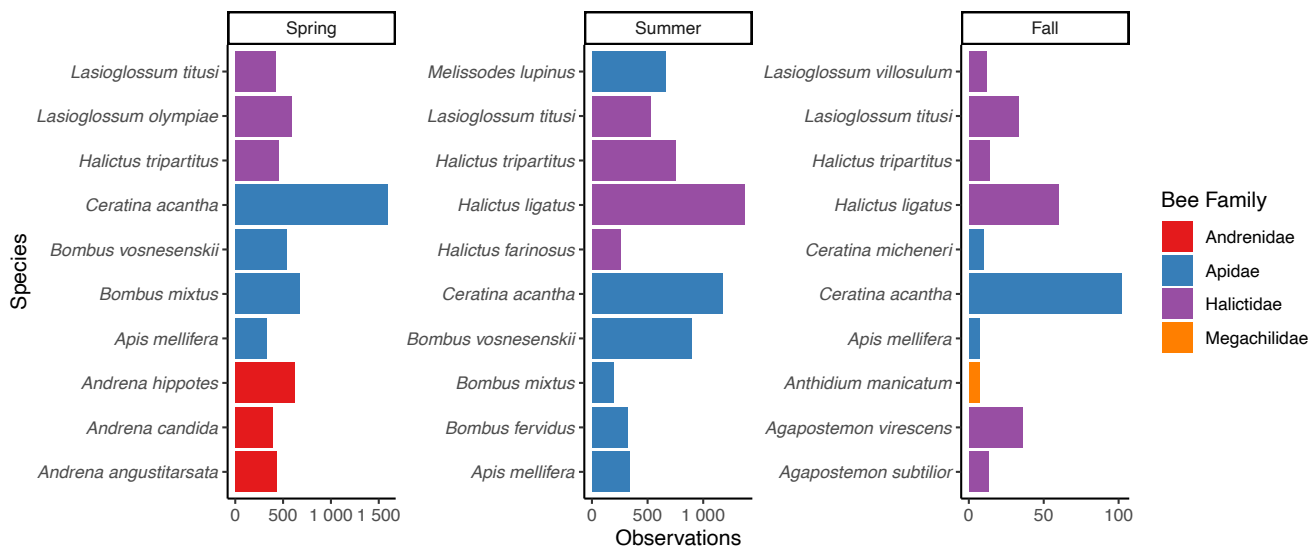


Figure 72: Most abundant bee species documented in the Willamette Valley Ecoregion by season. Seasons are defined as spring (Mar 21 -Jun 20), summer (Jun 21 -Sep 22), and fall (Sep 23 -Dec 21).

Uncommon Bee Species for the Willamette Valley ecoregion

Table 20: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Willamette Valley Ecoregion.

Bee Species	Observations
<i>Andrena annectens</i>	4
<i>Andrena erythrogaster</i>	1
<i>Andrena saccata</i>	1
<i>Andrena w-scripta</i>	1
<i>Coelioxys erysimi</i>	1
<i>Coelioxys novomexicanus</i>	3
<i>Coelioxys serricaudatus</i>	4
<i>Colletes kincaidii</i>	3
<i>Hylaeus modestus</i>	2
<i>Lasioglossum albipenne</i>	5
<i>Lasioglossum colatum</i>	2
<i>Lasioglossum engleri_MS</i>	1
<i>Lasioglossum macoupinense</i>	2
<i>Lasioglossum marinense</i>	2
<i>Lasioglossum novascotiae</i>	2

Table 20: Bees with fewer than 15 Oregon Bee Atlas observations, and fewer than 10 in the Willamette Valley Ecoregion.

Bee Species	Observations
<i>Melissodes communis</i>	2
<i>Osmia dolerosa</i>	5
<i>Osmia giliarum</i>	1
<i>Osmia nanula</i>	1
<i>Osmia odontogaster</i>	1
<i>Osmia physariae</i>	1
<i>Osmia trevoris</i>	1
<i>Panurginus atriceps</i>	1
<i>Stelis montana</i>	1
<i>Triepeolus californicus</i>	1
<i>Xylocopa virginica</i>	7

Known specialist bee species present in the Willamette Valley ecoregion

This list is produced by querying species included in the literature review of specialist bees produced by Fowler and Droege (2020). As this list is derived from historical literature, there are errors both in underestimating and overestimating specialization, and some misapplications of plant names. Many more specialist bees have been documented by the Oregon Bee Atlas, but these are omitted because their floral relations have not yet been recognized in the literature, or were overlooked in the production of our reference list. Empirical analysis of Oregon Bee Atlas bee-plant interaction occurrence records will add many new specialized relationships to this output in future publications.

Table 21: Specialist bees present in the Willamette Valley ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena annectens</i>	4	Salix L.
<i>Andrena astragali</i>	7	Zigadenus Michx. (Toxicoscordion Rydb.)
<i>Andrena caerulea</i>	15	Ranunculus L.
<i>Andrena cuneilabris</i>	3	Ranunculus L.
<i>Andrena erythrogaster</i>	1	Salix L.
<i>Andrena evoluta</i>	20	Agoseris Raf.
<i>Andrena frigida</i>	46	Salix L.
<i>Andrena illinoiensis</i>	2	Salix L.
<i>Andrena microchlora</i>	7	Lomatium Raf.
<i>Andrena orthocarpi</i>	94	Lasthenia Cass.
<i>Andrena pensilis</i>	32	Lasthenia Cass.
<i>Andrena perarmata</i>	4	Salix L.

Table 21: Specialist bees present in the Willamette Valley ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Andrena salicifloris</i>	118	Salix L.
<i>Andrena semipunctata</i>	5	Salix L.
<i>Andrena striatifrons</i>	1	Salix L.
<i>Andrena subaustralis</i>	6	Salix L.
<i>Anthidium utahense</i>	23	Fabaceae: Lotus L.
<i>Calliopsis edwardsii</i>	1	Horkelia Cham. & Schltdl., Potentilla L.
<i>Colletes consors</i>	5	Boraginaceae; Hydrophyllaceae
<i>Colletes fulgidus</i>	1	Asteraceae: Achillea L., Chrysanthamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Holocarpha Greene, Layia Hook. & Arn. ex DC., Rudbeckia L., Solidago L.
<i>Diadasia nigrifrons</i>	30	Malvaceae: Sidalcea A. Gray
<i>Dianthidium subparvum</i>	1	Asteraceae: Agoseris Raf., Chaenactis DC., Chrysanthamnus Nutt., Cirsium Mill., Corethrogyne DC., Encelia Adans., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helianthus L., Helionis Nutt., Machaeranthera Nees, Pentachaeta Nutt., Palafoxia Lag., Pyrrocoma Hook., Solidago L., Stephanomeria Nutt., Viguiera Kunth
<i>Dianthidium ulkei</i>	4	Asteraceae: Achillea L., Baileya Harv. & A. Gray ex A. Gray, Chrysanthamnus Nutt., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Heterotheca Cass., Hulsea Torr. & A. Gray, Lessingia Cham., Machaeranthera Nees, Pentachaeta Nutt., Solidago L., Stephanomeria Nutt., Symphyotrichum Nees, Verbesina L.
<i>Dufourea holocyanea</i>	3	Symphoricarpos Duham.
<i>Heriades cressoni</i>	1	Asteraceae: Chrysanthamnus Nutt., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Machaeranthera Nees, Senecio L.
<i>Hylaeus basalis</i>	4	Rosaceae: Potentilla L.
<i>Megachile fidelis</i>	26	Asteraceae: Chrysanthamnus Nutt., Cirsium Mill., Coreopsis L., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Gutierrezia Lag., Haplopappus Cass., Helenium L., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Machaeranthera Nees, Madia Molina, Plectoccephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees, Verbesina L., Viguiera Kunth
<i>Megachile gravita</i>	34	Clarkia Pursh

Table 21: Specialist bees present in the Willamette Valley ecoregion with the number of times each species has been documented and its reported floral host(s).

Bee Species	Obs.	Floral Hosts (Fowler & Droege, 2020)
<i>Megachile melanophaea</i>	1	Fabaceae: Astragalus L., Hedysarum L., Lotus L., Lupinus L.
<i>Megachile perihirta</i>	62	Asteraceae, Fabaceae
<i>Megachile pugnata</i>	7	Asteraceae: Cirsium Mill.
<i>Melissodes agilis</i>	2	Asteraceae: Cirsium Mill., Grindelia Willd., Helianthus L., Ratibida Raf., Rudbeckia L., Simsia Pers., Solidago L., Verbesina L.
<i>Melissodes bimatrix</i>	4	Asteraceae: Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Grindelia Willd., Gutierrezia Lag., Helianthus L., Isocoma Nutt., Machaeranthera Nees, Symphyotrichum Nees, Verbesina L.
<i>Melissodes clarkiae</i>	24	Clarkia Pursh
<i>Melissodes lupinus</i>	683	Asteraceae: Bidens L., Centromadia Greene, Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Grindelia Willd., Helianthus L., Hemizonia DC., Heterotheca Cass., Holocarpha Greene, Plectocephalus D.Don, Solidago L., Stephanomeria Nutt., Symphyotrichum Nees
<i>Melissodes microstictus</i>	125	Asteraceae: Achillea L., Anaphalis DC., Antennaria Gaertn., Chrysothamnus Nutt., Cirsium Mill., Ericameria Nutt., Erigeron L., Grindelia Willd., Hazardia Greene, Helenium L., Helianthus L., Heterotheca Cass., Plectocephalus D.Don, Rudbeckia L., Senecio L., Solidago L., Symphyotrichum Nees
<i>Melissodes rivalis</i>	13	Asteraceae: Brickellia Elliott, Cirsium Mill., Helianthus L., Plectocephalus D.Don
<i>Osmia californica</i>	2	Asteraceae: Balsamorhiza Nutt., Chaenactis DC., Cirsium Mill., Ericameria Nutt., Heliomeris Nutt., Heterotheca Cass., Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia coloradensis</i>	11	Asteraceae: Chaenactis DC., Cirsium Mill., Coreopsis L., Encelia Adans., Erigeron L., Senecio L.
<i>Osmia montana</i>	7	Asteraceae: Agoseris Raf., Chaenactis DC., Cirsium Mill., Encelia Adans., Ericameria Nutt., Erigeron L., Eriophyllum Lag., Grindelia Willd., Helianthella Torr. & A. Gray, Hulsea Torr. & A. Gray, Layia Hook. & Arn. ex DC., Senecio L., Wyethia Nutt.
<i>Osmia nigrifrons</i>	3	Fabaceae: Astragalus L., Lupinus L., Trifolium L.
<i>Osmia physariae</i>	1	Fabaceae: Astragalus L., Lotus L., Trifolium L.
<i>Osmia ribifloris</i>	1	Ericaceae: Arctostaphylos Adans.
<i>Osmia texana</i>	26	Cirsium Mill.
<i>Peponapis pruinosa</i>	6	Cucurbita L.
<i>Perdita nevadensis</i>	102	Eriogonum Michx.

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Appendix 1: County Summaries

Table 22: Summary of bee species, plant hosts, specimen volume, and unique collectors by Oregon county.

County	Bee Species	Plant Species	Bees Collected	Collectors
Baker	211	139	3,131	22
Benton	179	343	7,474	58
Clackamas	140	246	3,164	48
Clatsop	55	83	501	18
Columbia	122	207	3,502	16
Coos	48	33	210	14
Crook	226	177	3,666	28
Curry	120	143	1,422	21
Deschutes	303	332	12,670	51
Douglas	132	136	1,530	32
Gilliam	94	49	763	22
Grant	223	162	3,254	22
Harney	333	271	9,223	41
Hood River	176	184	4,525	45
Jackson	295	390	13,179	42
Jefferson	211	197	3,189	35
Josephine	286	436	8,914	50
Klamath	286	396	7,021	48
Lake	352	253	14,428	40
Lane	243	371	9,463	53
Lincoln	117	190	2,671	25
Linn	166	181	2,281	50
Malheur	189	139	6,383	21
Marion	203	315	5,642	40
Morrow	104	41	2,787	17
Multnomah	112	233	2,675	44
Polk	133	172	2,388	29
Sherman	132	110	2,951	46
Tillamook	71	89	836	22
Umatilla	181	187	2,247	29
Union	165	134	1,876	25
Wallowa	194	171	3,887	38

Table 22: Summary of bee species, plant hosts, specimen volume, and unique collectors by Oregon county.

County	Bee Species	Plant Species	Bees Collected	Collectors
Wasco	195	222	7,957	51
Washington	184	362	8,795	53
Wheeler	207	155	3,760	32
Yamhill	173	352	11,542	52

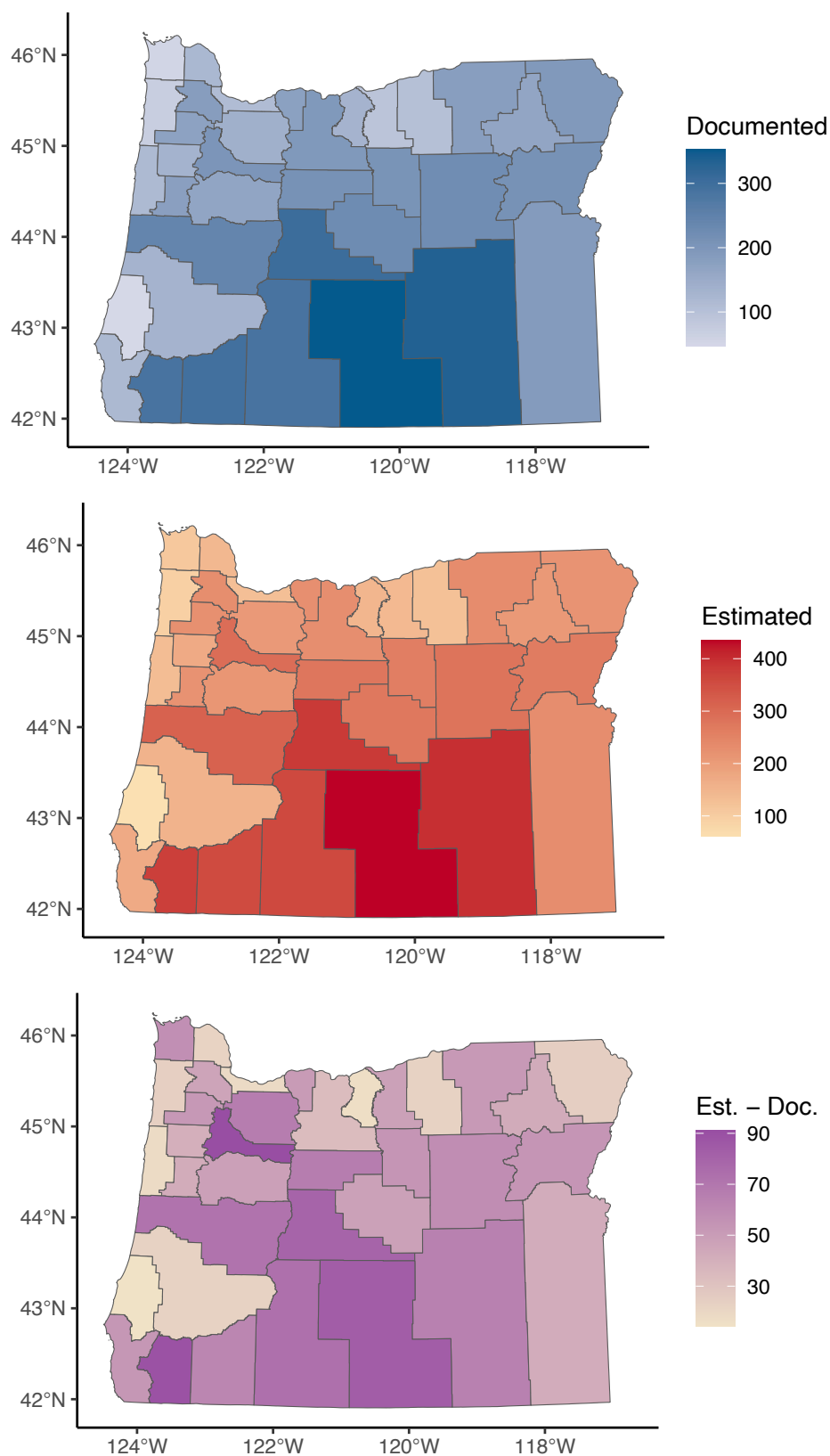


Figure 73: Choropleth of bee species richness in Oregon counties. Top: number of bee species documented, Middle: estimated number of bee species present based on curated specimens, Bottom: the difference between estimated and documented bee species richness.

Appendix 2: Acknowledgements and Funding

Contributors

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Oregon Bee Atlas Advisory Committee

David Kollen, Curry County, Apprentice Level Master Melittologist

Richard Little, Lane County, Apprentice Level Master Melittologist

Michelle Marshall, Multnomah County, Apprentice Level Master Melittologist

Maarty Van Otterloo, Curry County, Apprentice Level Master Melittologist

Michele Sims, Deschutes County, Journey Level Master Melittologist

Carol Yamada, Multnomah County, Journey Level Master Melittologist

The current Advisory Committee started in April 2026 and the Oregon Bee Project and Oregon Bee Atlas have benefited greatly from the contributions of past members. The Oregon Bee Project/Atlas Advisory Committees were first convened in 2018.

Oregon Bee Atlas

We are immensely grateful to the 224 Master Melittologist program volunteers who have surveyed wild bees throughout the state and donated those specimens to the Oregon Bee Atlas initiative. The following individuals have served as the vital foundation of our research efforts, committing extensive time to field documentation and specimen collection across the state. This list recognizes the dedicated contributions of:

Bruce Adams, Susan Albright, Brett Aldrich, Susan Aldrich-Markham, Brian Allen, Myrna Anderson, Dawn Anzinger, Pam Arion, Pamela Arion, Heidi Ashworth, Linda Austin, John Baldwin, Christopher Bateman, Nancy Baumeister, Ryan Bear, Maureen Beezhold, Rocky Bessette, Lincoln Best, Julie Biddle, Mike Bogar, Laure Bordelon, John Brandsberg, Debra Brimacombe, Rachael Brock, Katie Buckley, Christine Buhl, Anne Bulger, Janice Buschman, Robert Buschman, Tom Canales, Jan Carlson, Ingrid Carmean, Cassidy Carpenter, Nancy Case, Steve Castagnoli, Rob Caulfield, Rebecca Cheek, Nicole Christensen, Paris Coleman, Desiree Costello, Randy Costello, Karleen Davis, Katharina Davitt, Amy Dean, Kathleen Dennis, Leana Dickerson, Jesse Dillow, Dennie Dunkeson, Marie Dunkeson, Thomas Ebert, Joe Engler, Cody Feuerborn, Frances Fischer, Sara Fischer, Cathy Flick, Pat Fritz, Sarah Gardner, Michael Getz, Robin Gill, Emily Gladhart, Peter Gladhart, Steve Gomes, Kelly Goodwin, Mark Gorman, Maggie Graham, Parker Graham, Lauren Grand, Amy Grotta, Larry Gruis, James Hagerman, Trinity Harvey, Jerry Haugen, Max Havlik, Jen Hayes, Molly Hayes, Pam Hayes, Stephanie Hazen, Madeline Herrmann, Madeline Herrmann, Autumn Hickman, Jessica Hird, Shani Hodge, Tucker Hoffman, Russel Hopper, Carol Horning, Frank Howarth, Amanda Huffman, Lori Humphreys, August Jackson, Rose Jade, David Jennings, Miranda Jones, Sarah Kincaid, Nan Kirby, Jan Knapik, David Kollen, Tess Krampien, Noelle Landauer, Belle Lareau, Finn Larsen, Tanya Lasswell, Sayaka Lean, Briana Lindh, Zoe Little, Cara Logan, Greg Low, Carrie Lowe, Natalie Lozano, Sarah Malaby, Andrea Mann, Michelle Marshall, Missy Martin, Rachel Maxey, Judith Maxwell, Shannon Mayfield, Jocelyn McAuley, Phineas McDermott, Phylis McIntosh, Andony Melathopoulos, Cynthia Middlebrooks, Carole Miles, Mike Miller, Andrew Moldenke, Patricia Moreland, Robert Morris, MaryJo Mosby, Paul Moschetti, Courtney Neron, Jo Noren, Rachel Nypaver, Kathleen O'Hern, Robert Ohrn, Dan O'Loughlin, Michael O'Loughlin, Kimberly Olson, Steven Olson, Francis Opila, Maarten Van Otterloo, Travis Owen, Roberta Packard, Philip Paterno, J. Patterson, LaVina Patterson, Jerry Paul, Bill Percy, Bill Peckham, Gretchen Pederson, Robert Pederson, Lenny Peterson, Todd Pfeiffer, Rachel Phariss, Stephanie Pickern, Jane Pope, Mary Powers, Naomi Price, Mike Raschko, Amber Reese, Jessica Rendon, Karen Richards, Martha Richards, Tom Robertson, Lisa Robinson, Carly Rohn, Dana Ross, Nancy Ross, Josee Rousseau, Brooke Ruby, Elaine Rybak, Kayla Saager, Nicole Sanchez, Sarah Sanchez, Lisa Sanco, Audrey Sauble, Charles Schelz, David Schiappa, Tim Schoenfelder, Jeana Schorr, Gene Scoonover, Pam Scoonover, Ruby Seitz, Anthony Shannon-Thorn, Bonnie Shoffner, Ellen Silva, Kathryn Simon, Katie Simpson, Michele Sims, Adrienne Smith, Candy Solovjovs, Debbie Sprester, Marek Stanton, Vetta Steel, Martin Stein, Shawn Steinmetz, Toni Stephan, Hollie Stephenson, Heather Stoven, Scott Sublette, John Sullivan, Jeanie Taylor, Laura Taylor, Larry Teeter, Wiley Thompson, Wendy Thornburg, Scott Tienken, Alyssa Tollefson, Karen Viste-Sparkman, Steve Walters, Jeffrey Warneking, Ellen Watrous, Annie Watts, Rick Westcott, Pat Wheeler, Henry Whitridge, Heike Williams, Richard Williams, Julie Wilson, Patti Wittrup, Rich Wittrup, Sarah Woods, Karen Wright, Carol Yamada, Linda Zahl, Sienna Zamlich, and Colin Zylka.

Funding

Grants

The efforts of the Oregon Bee Project have been supported through the following grants: Explore Oregon Bees Farm to CNP 2024 (2023, Oregon Department of Education), Evaluating Mowing Practices for Pollinator Habitat Enhancement: Highway Vegetation Management and its Impact on Native Bee Communities and Endangered Pollinators (2026-2029, Oregon Department of Transportation), Bee Activity Book for Region 10 (2023-2024, Environmental Protection Agency), Certifying Oregon Wine Grapes as Bee Friendly (2022-2024, Oregon Department of Agriculture/USDA Agricultural Marketing Service/Western SARE), Residual Toxicity of Insecticides to Honey Bees and Correspondence to Information on Pesticide Labels (2022-2023, Western IPM Center/USDA National Institute of Food and Agriculture), IPM for Western Managed Pollinator Protection Plans (MP3) (2021-2022, Western IPM Center/USDA National Institute of Food and Agriculture), Bee Protection Protocols for Oregon Vegetable and Clover Seed (2019-2022, USDA National Institute of Food and Agriculture/Western SARE) and Pollinator Health Extension and Metrics in the Pacific Northwest (2018-2021, Foundation for Food and Agriculture Research, 549024).

The efforts of the Oregon Bee Atlas have been supported through the following grants: Master Melittologist Bee Atlas Program in the Pacific Northwest (2024-2029, USDI FWS, F-FWS-NWRS-24-039), Evaluation of methods for statewide survey of bumble bee populations (2020-2021, Agriculture Research Foundation), Survey of *Bombus* (Hymenoptera: Apidae) and DNA barcoding of sagebrush biome wild bees (Hymenoptera: Anthophila) in Oregon's High Desert (2022-2025, USDI FWS, F23AC01846), Evaluation of annual and perennial forage plants for honey bees and native bees (2022-2023, Project ApisM), The B-Team: Help for land managers who need to inventory bee biodiversity and identify associated plant communities (2023-2026, USDA-NIFA - 2022-08511), Forest pollinator research project (2022, Oregon Department of Forestry), Certifying Oregon Wine Grapes as Bee Friendly (2022-2024, USDA Agricultural Marketing Service, ODA22014GR), Stockpiling pasture legumes and forbs for honey bees and self-regeneration of pastures (2020-2021, Project ApisM), Bee Friendly Farming for Oregon Wine Grapes (2022-2024, Western SARE, G362-22-W9211), New opportunities for establishing NRCS pollinator habitat in the Pacific Northwest (2020-2022, USDA Natural Resources Conservation Service, NR203A750008G004) and Pollinator Health Extension and Metrics in the Pacific Northwest (2018-2021, Foundation for Food and Agriculture Research, 549024).

Jerry and Judith Paul Native Pollinator Endowment

The **Jerry and Judith Paul Native Pollinator Endowment** at Oregon State University is a philanthropic fund established through the OSU Foundation to support the Oregon Bee Atlas and related pollinator research, outreach, and conservation activities. The Endowment reflects the long-standing commitment of Jerry and Judith Paul to advancing knowledge of Oregon's wild bees and promoting stewardship of pollinator biodiversity; funds generated from the endowment help sustain field surveys, community science participation, education, and habitat-focused initiatives tied to the Atlas.



Figure 74: Jerry Paul was a Corvallis-based conservation advocate, former urban planner and public-sector professional, and an active community volunteer whose deep interest in native plants, wildlife, and pollinators shaped his later life. After a career in planning and information technology and years managing a cattle ranch in California, he relocated to Corvallis, where he devoted himself to conservation work, including service with the Benton Soil and Water Conservation District, the Chintimini Wildlife Center, and the formation of the Oregon Bee Atlas. He was especially engaged in initiatives supporting wild bees, helping develop local projects such as mason bee programs and contributing to broader pollinator education and habitat efforts. The endowment in his and Judith Paul's name honors this legacy of community service, conservation leadership, and dedication to protecting pollinators.

The Endowment is being built from contributions of the following individuals:

Maya Abels, Peter Abrahamsen, AnnaRose Adams, Bruce Adams, Cassandra Agan, Alex Agan, Susan Albright, Brett Aldrich, Brian Allen, Rafael Arellano-Barrera, Adrienne Ash, Britteny Asher, Ellen Austin, Frederick Barrett, Nancy Baumeister, Marilyn Beach, Roy Beckemeyer, Mike Bogar, Kimberly Brown, Todd Brown, Jorian Bruslind, Anne Bulger, Elizabeth Burke, Carrie Burkholder, Robert Buschman, Janice Buschman, Lacey Caligure, Becky Campbell, Olivia Carril, Nathan Carter, Steven Castagnoli, Amy Chadburn, Mark Chao, Rebecca Cheek, Claudia Coke, Darren Coleman, Chris Correnti, Christine Crick, Holly Crosson, Amy Crumley, Laura Cryst, Ann Dahlgren, Karleen Davis, Terry Day, Lupine DeSnyder, Leana Dickerson, Eric Dietz, Lynne Dittmer, Kathy Dolezal, Lauren Doyle, Raymond Drapek, Gloria Dunlap, Susan Dupere, Erin Durst, Michael Eichler, Kenneth Eklund, Elizabeth Engel, Joe Engler, Adriana Escobedo-Land, Emily Everett, Brian Fackler, Rebecca Fisher, Allen Freudenthal, Ion Gardescu, Jeffrey Garlock, Cindy Geffel, Jennifer Gibbins, Robin Gill, Kristin Gnojewsk, Mark Gorman, Conner Haj, Gay Hall, Janice Hamby, Brenda Hartzog, Ian Harwood, Marc Hayes, Peter Hayes, Mark Headley, Erin Helgren, Tristan Hernandez, Jorge Hernandez, Aidan Hersh, Katherine Hershey, Dawn Higginson, Douglas Hintz, Jessica Hird, Lynn Hochstetter, Shani Hodge, Rebecca Hoffmeister, David Hohler, Rachel Holland, Amanda Huffman, Lori Humphreys, August Jackson, Alanna Jacob, David Jennings, Michael Johnson, Marian Jones, Susan Karasoff, Terry Keim, Sandra Kennemer, Nancy King, Janet Kirch, Nicholas Knight, Autumn Knights-Kirk, Rustam Kocher, David Kollen, Ann Kosanovic-Brown, Mikela Kruger, Suzanne Kruse, Noelle Landauer, Noelle Landaver, Clare LeDuff, Sayaka Lean, Kristina Lefever, Ruth Lemein, Joan Lintz, Karen Lippsmeyer, Richard Little, Annette Lovett, Patrick Malone, Michelle Marshall, Marilyn Martin, Melissa Martin, Autumn Maust, Miles McEvoy, Brendan McGarry, Michael McNamara, Andony Melathopoulos, Jessica Merkner, Andrew Miles, Carole Miles, Mary Moerlins, Dale Mosby, Vani Narasimhan, Richard Neahring, Patricia Nemec, Joan Newhouse, John Niggley, Julie Noel, Michael O'Loughlin, Daniel O'Loughlin, M. E. O'Rourke, Kimberly Olson, Kim Olson, Leilani Osorio, Walt Ostergard, Heather Pace, Roberta Packard, Louisa Page, Beverly Park, Barbara Passy, Gretchen Pederson, Anna Perry, Rachel Phariss, Suzanne Phillips, Cynthia Piez, Cris Pinzon, Heather Poehler, Laurie Power, Alice Price, A.C. Quinn, Delaney Ralph, Kristin Rasmussen, Kellie Redding, Linda Reinhard, Martha Richards, Casey Richwine, Mollyanna Rios-Nogales, Mary Roberts, Thomas Robertson, Lisa Robinson, Mark Romanaggi, Kyle Roslund, Mark Ross, Melinda Roth, Allyson Rounds, Julia Ruder, Laura Ruggles, Douglas Russell, Elaine Rybak, Karla Salp, David Schiappa, Diana Schmidt, Evan Sether, Anthony Shannon-Thorn, Riley Sharp, Mike Shaw, Bonnie Shoffner, Katie Simon, Lizzy Simpson, Richard Sitts, Jacquelyn Smith, John Sorensen, Debbie Spresser, Michael Stachow, Wesley Stanton, Kalika Stanton, Ellen Steel, Shawn Steinmetz, Toni Stephan, Scott Sublette, Michelle Sweeney, James Tarjan, Jeanie Taylor, Larry Teeter, Ray Temple, Ross Thayer, Mona Thomason, Wendy Thornburg, Sarah Van Otterloo, Maarten Van Otterloo, Brian Vandehey, Ashley Vanmeter, Karen Viste-Sparkman, Julie Vold, Scott Waddell, Jeff Warneking, Amy Warnock, Ellen Watrous, Ranee Webb, Dolores Weisbaum, Patricia Wheeler, Carol Whipple, David Wilkins, Denise Wilkinson, Rick Williams, Gwendolyn Williams, Corrinne Williams, Joan Williams, Heike Williams, Alex Wilson, Patti Wittrup, Carollee Woodstock, Lola Work, Carol Yamada, Faye Yoshihara, Jean Young

