

# Michael O'Loughlin

## Oregon Bee Atlas Collection and Identification Report

### 1 Your 2023 Collections

Michael O'Loughlin caught 1260 bees across 15 counties from May 13, 2023 to September 11, 2023, representing 72 unique taxa, including 44 unique species.

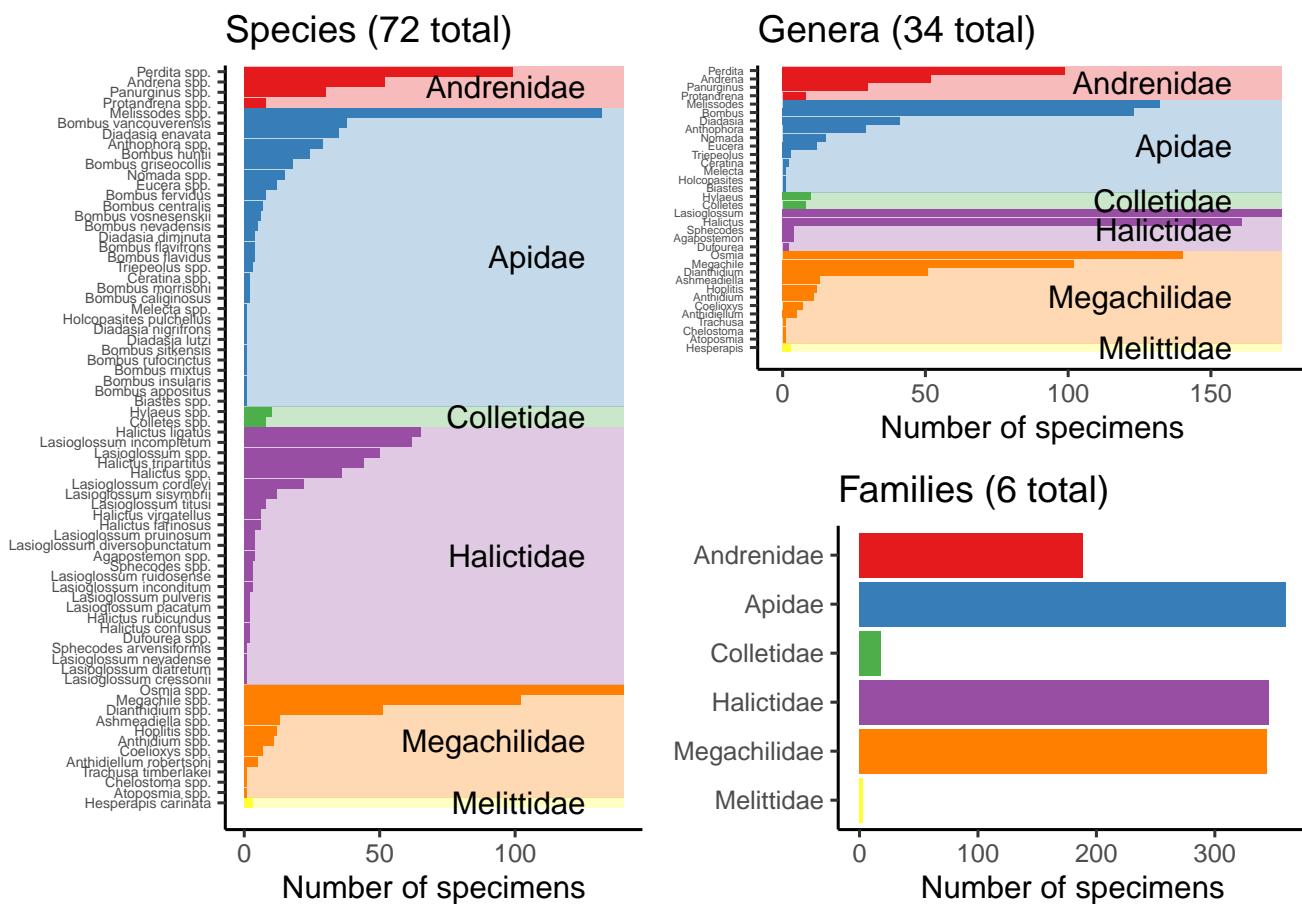


Figure 1: Bees caught by Michael O'Loughlin, broken down by species, genus, and family.

## 2 All Your Collections

Michael O'Loughlin caught 8596 bees across 39 counties from March 29, 2018 to June 10, 2024, representing 250 unique taxa, including 216 unique species. Michael O'Loughlin also caught the only *Calliopsis scitula* in the collection!

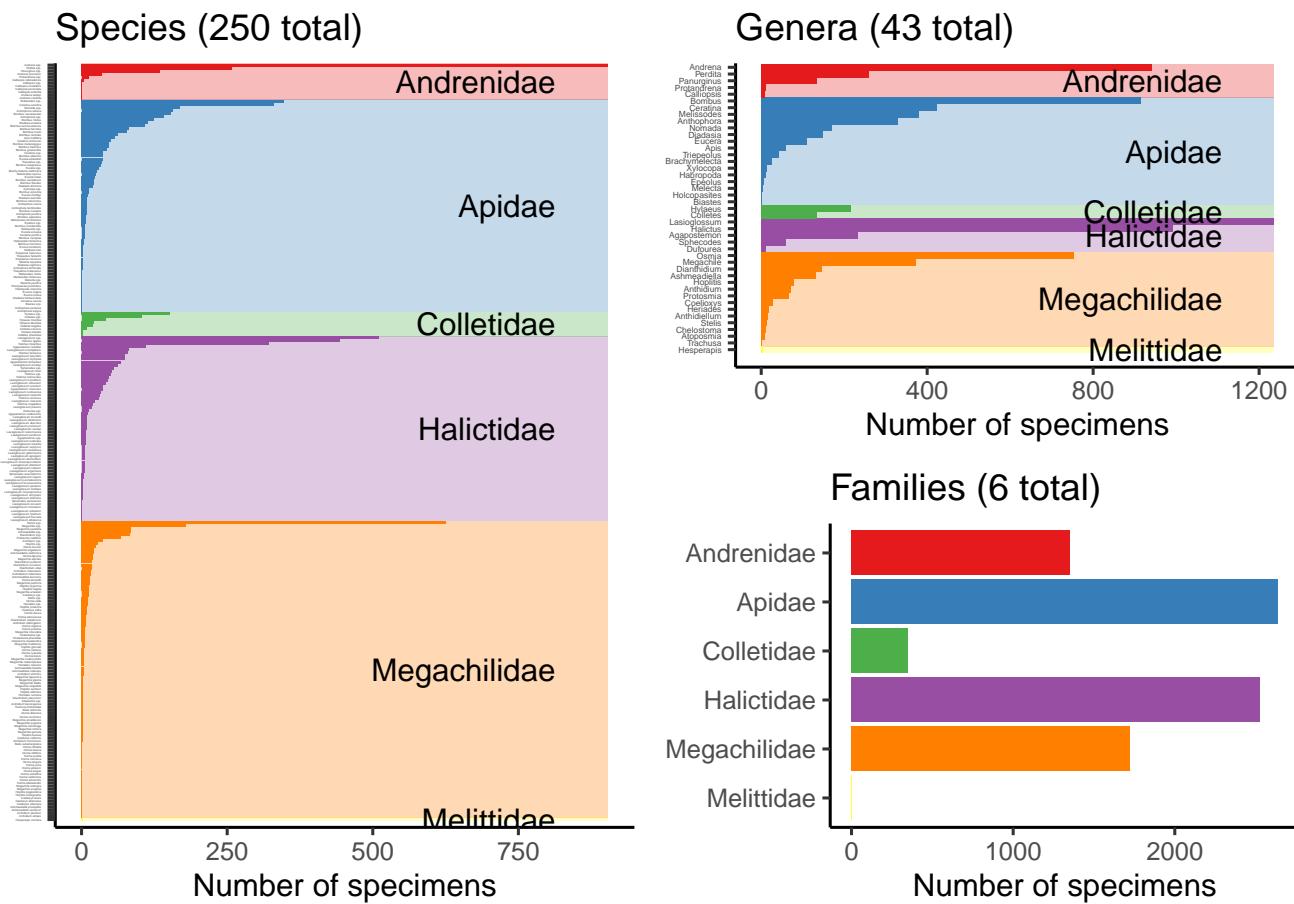


Figure 2: Bees caught by Michael O'Loughlin, broken down by species, genus, and family.

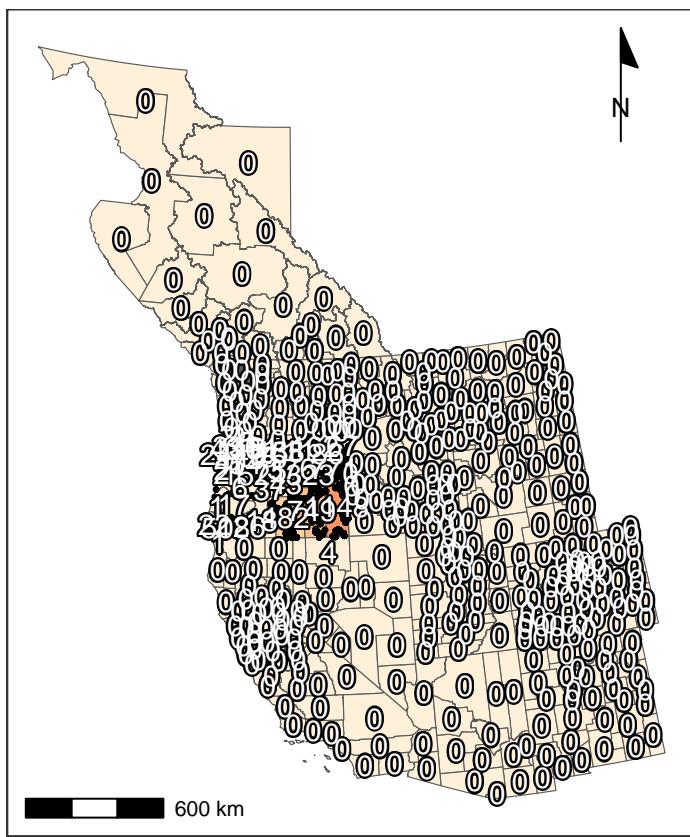


Figure 3: Bee catch locations for Michael O'Loughlin (within Oregon), along with total catches per county.

### 3 Total Catches

Volunteers from the Oregon Bee Atlas project caught 22575 bees across 45 counties from January 24, 2023 to December 13, 2023, representing 90 unique species and 49 unique genera. The **Nimble Net Kudos** (most specimens collected) goes to Scott Sublette, Dan O'Loughlin, and Michael O'Loughlin, who caught a total of 2274, 1283, and 1260 specimens. The *positive* kind of **Darwin Award** (most species collected) goes to Scott Sublette, Ellen Silva, and Michael O'Loughlin, who caught a total of 77, 74, and 72 unique species. Well done!

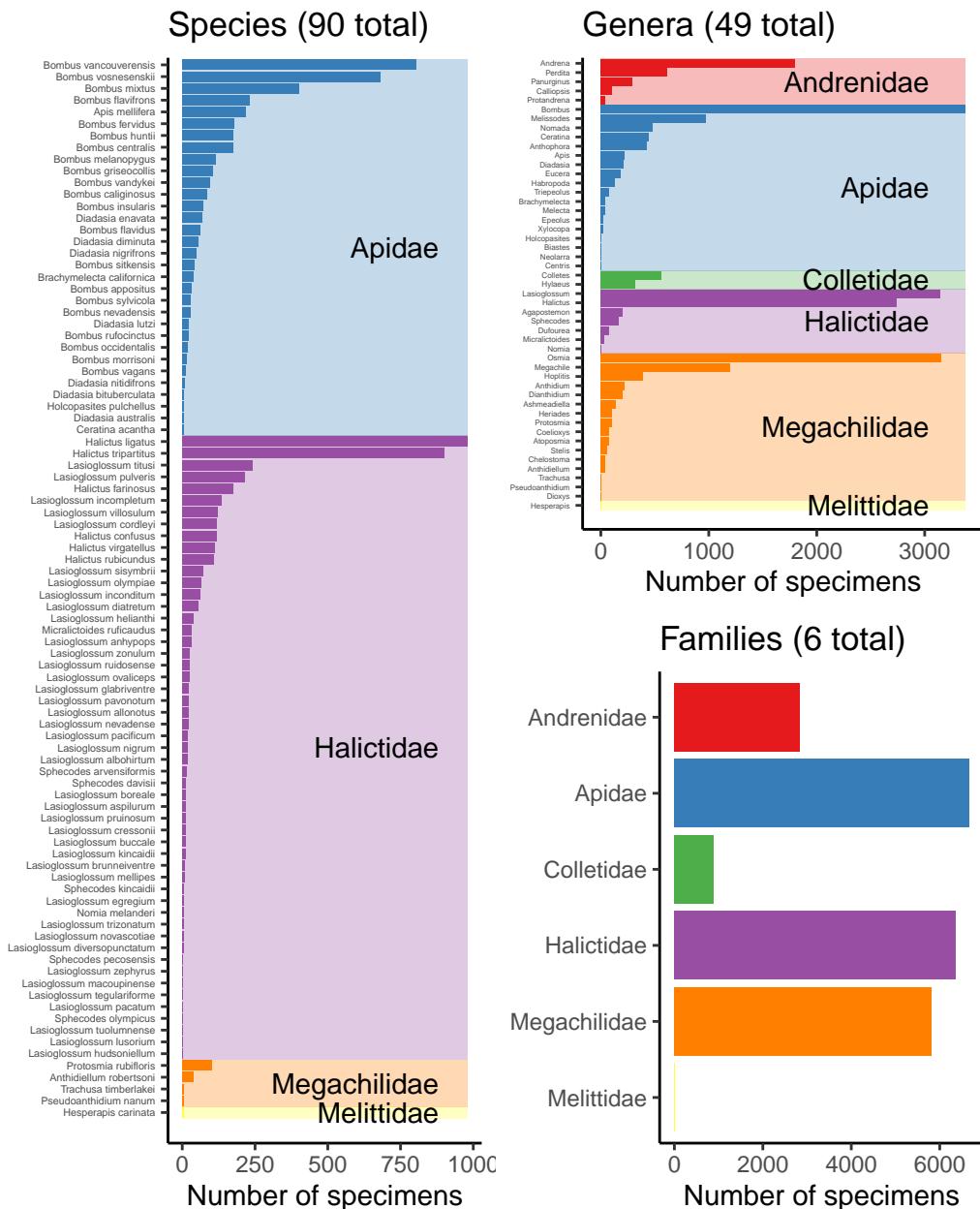


Figure 4: Bees caught by all volunteers, broken down by species, genus, and family.

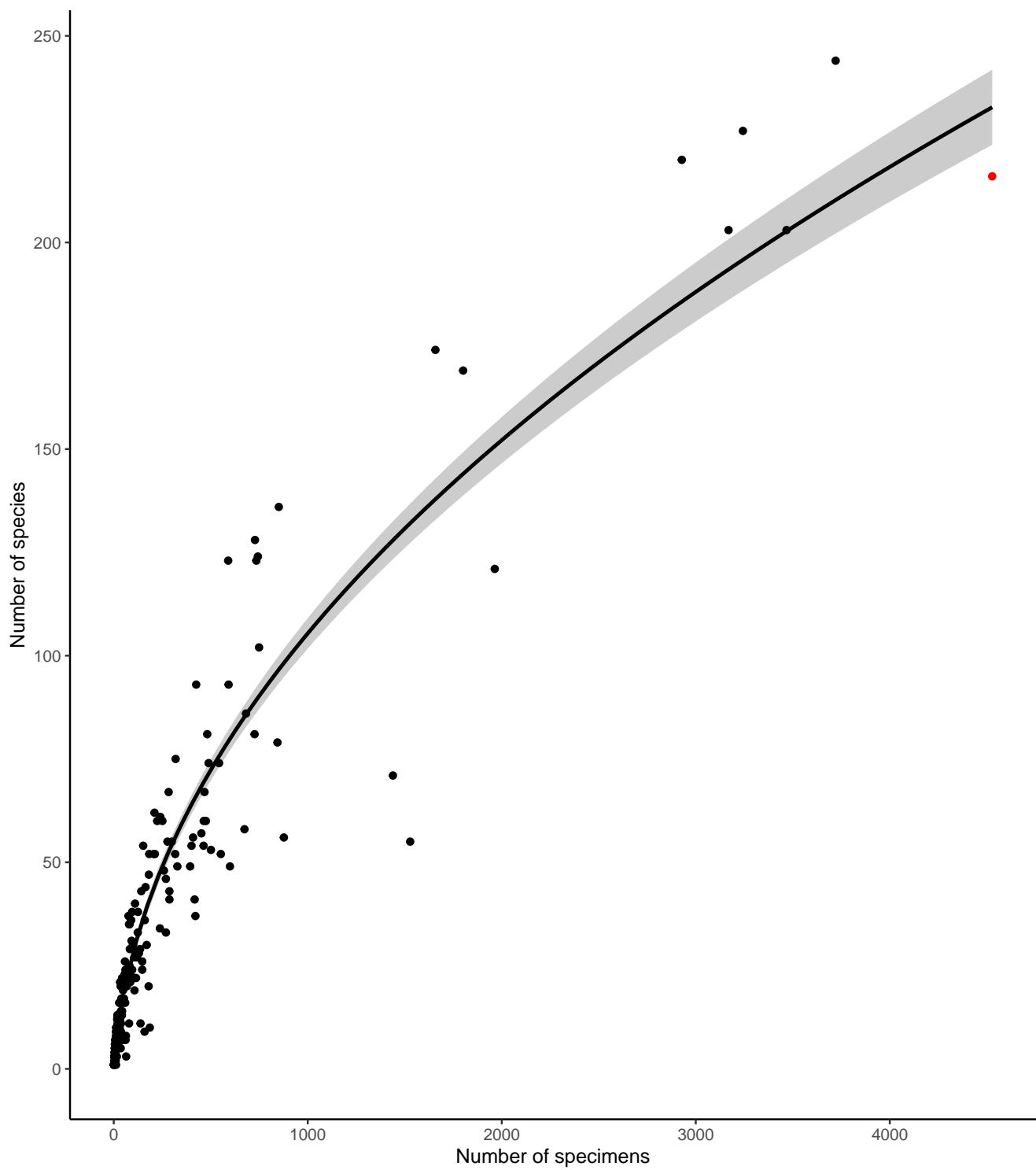


Figure 5: Number of bee specimens and unique bee species caught by all volunteers, with your effort shown in red. This graph should give you an idea of how many specimens you would need to catch to begin seeing rarer bee species.

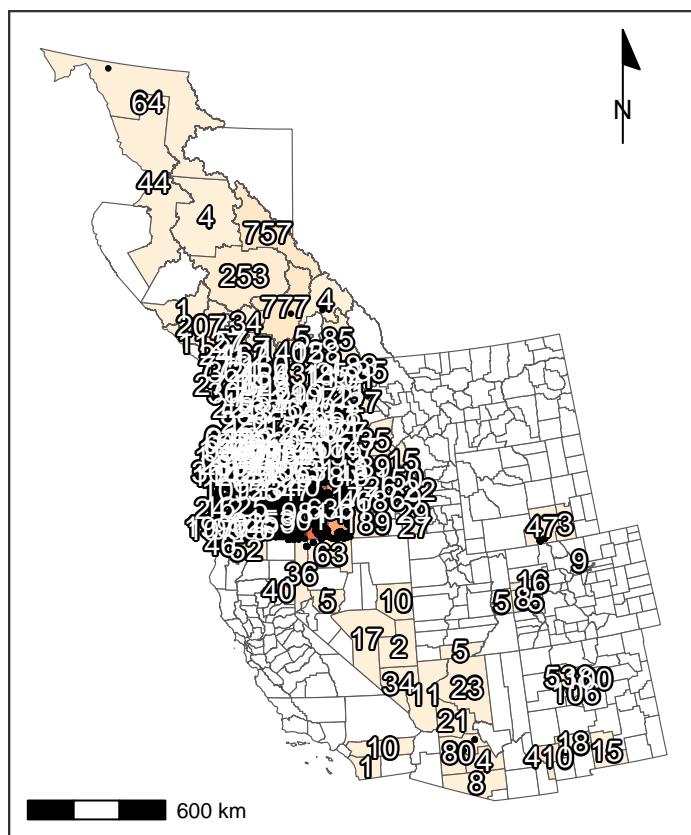


Figure 6: Total specimens caught per county, along with catch location of each specimen (black dots). For genus- and species-specific information for each county, see Tables 3 and 4.

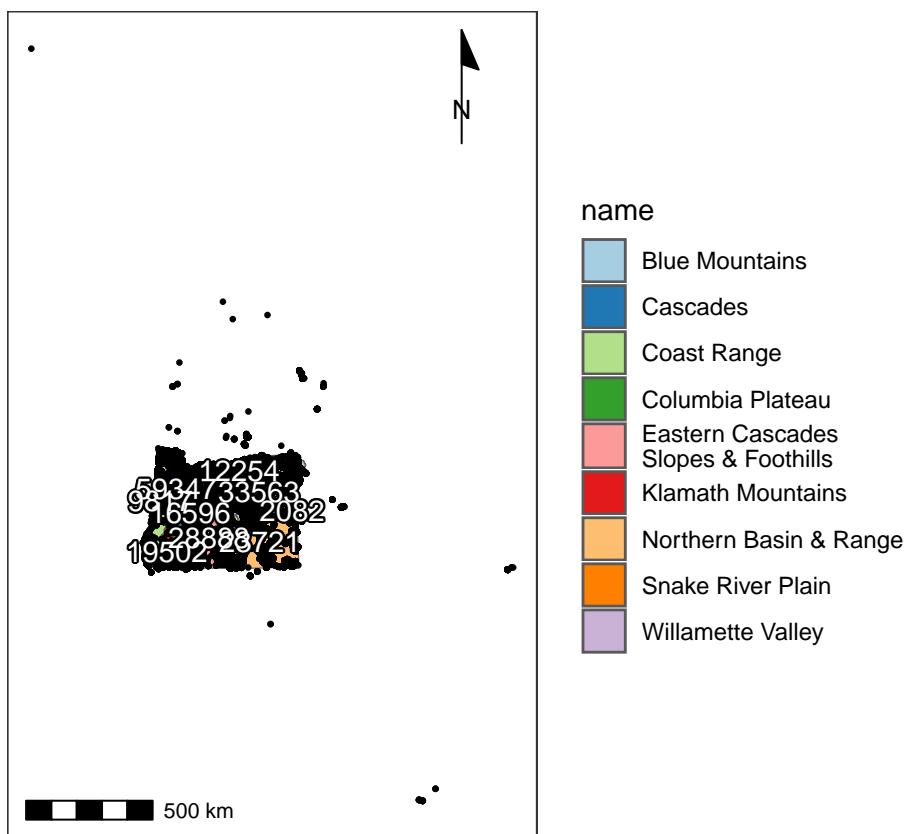


Figure 7: Total catches per (Level III) ecoregion, along with catch location of each specimen (black dots).

## 4 Flight Phenology

West of (and including) the Cascade Mountains, most bees (90%) were caught between April 13 and September 02, but the peak of season (50% of specimens) was from May 21 to July 26.

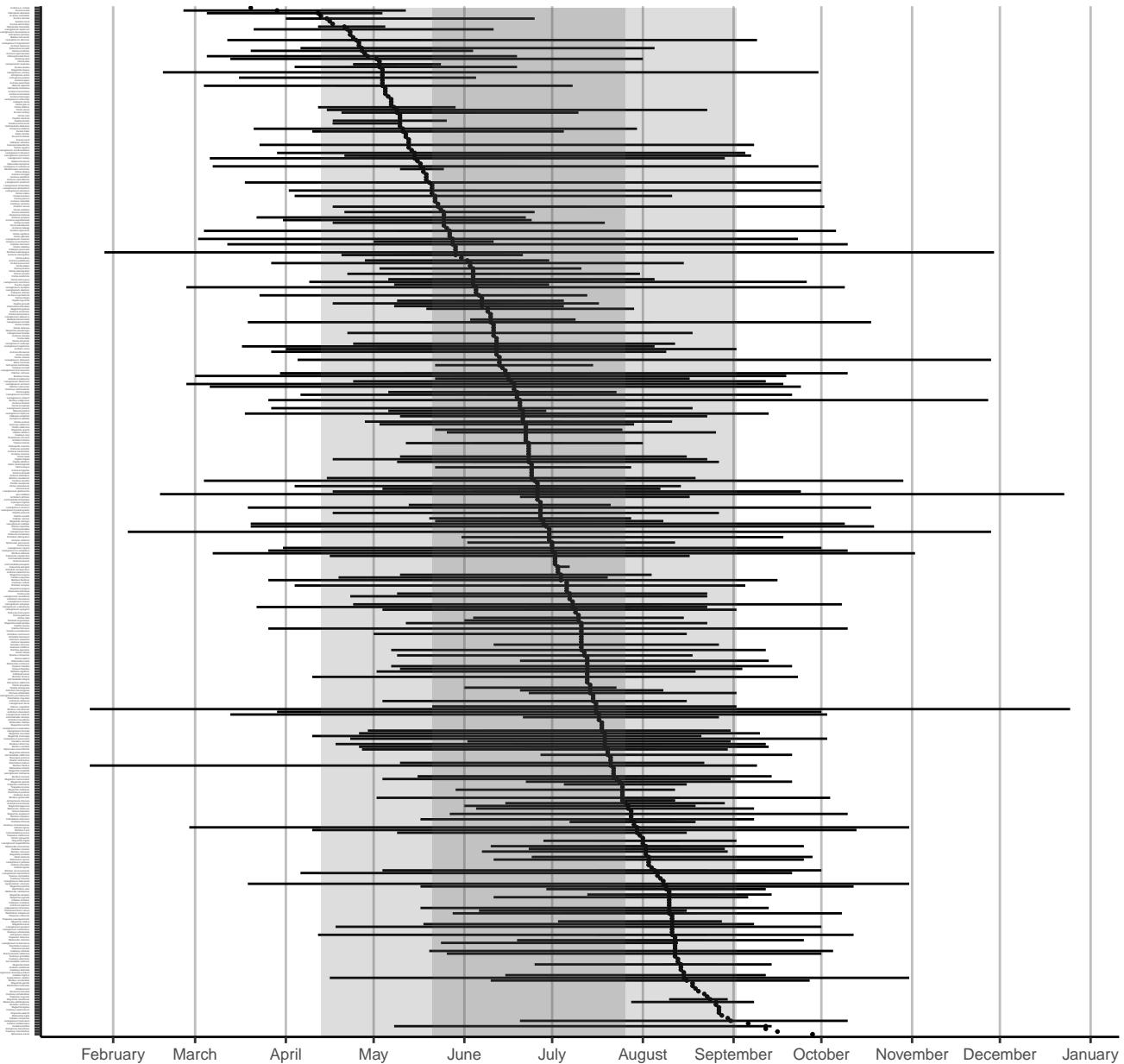


Figure 8: Phenology plot for all bee species caught in or West of the Cascade Mountains, sorted by median abundance times. Percentiles of overall emergence times (50th & 90th) are shown in grey shaded regions. Date ranges for each species (minimum, first, second, third quartiles, and maximum) are shown only for species with  $>10$  specimens.

**East of** the Cascade Mountains, most bees (90%) were caught between April 28 and September 16, but the peak of season (50% of specimens) was from June 02 to August 07.

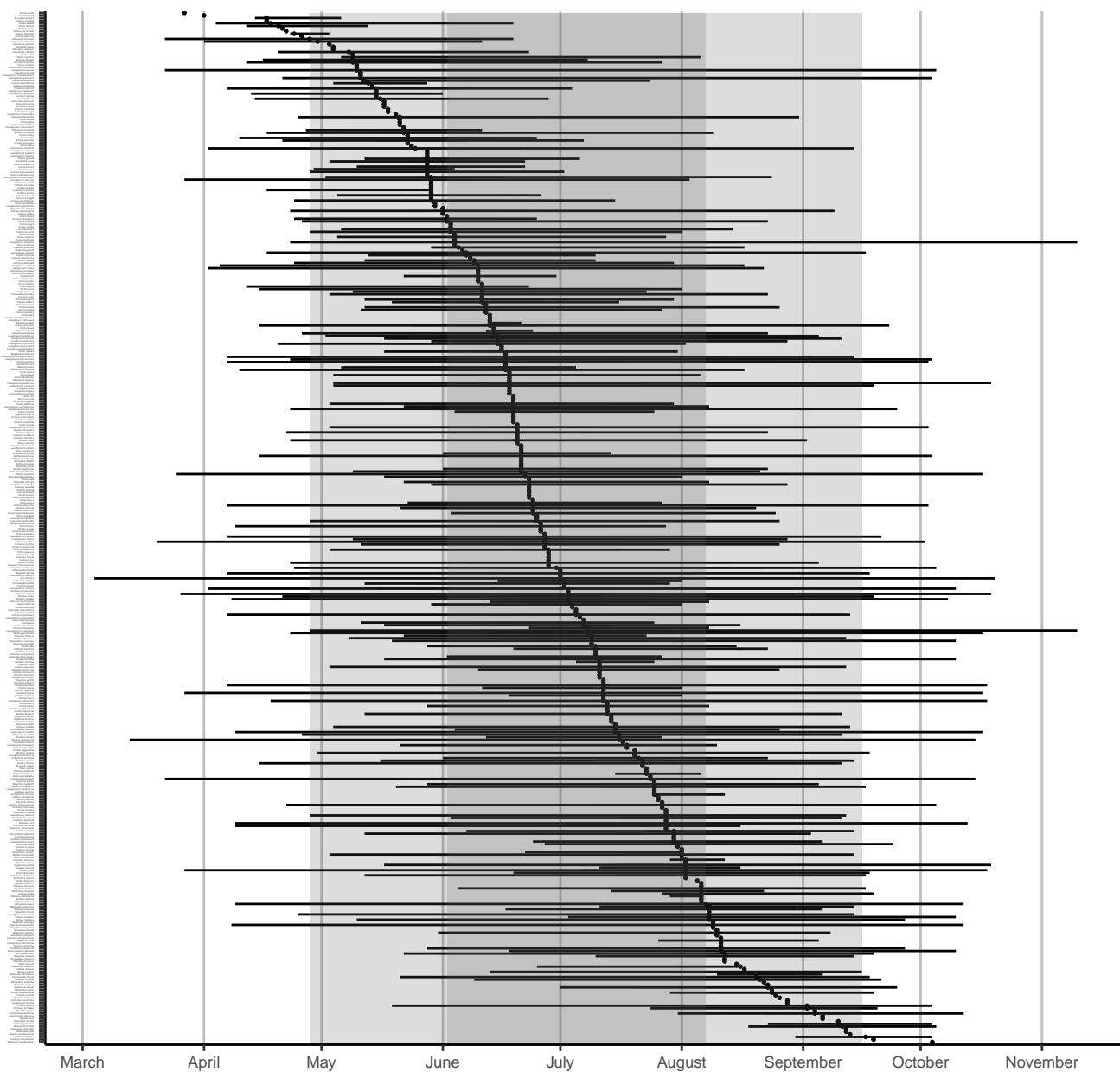


Figure 9: Phenology plot for all bee species caught east of the Cascade Mountains, sorted by median abundance times. Percentiles of overall emergence times (50th & 90th) are shown in grey shaded regions. Date ranges for each species (minimum, first, second, third quartiles, and maximum) are shown only for species with >10 specimens.

## 5 Plant genera

Volunteers collected specimens from a total of 645 unique flower genera, with most volunteers sampling from 17 flower genera (median value). The **Flower Power Kudos** (most sampled flower genera) goes to Michael O'Loughlin, Lori Humphreys, and Dan O'Loughlin, who collected bees from a total of 246, 214, and 188 genera of flowers. Well done!

The flower genera that had the most specimens caught on them were *Ericameria*, *Phacelia*, and *Penstemon*, which yielded a total of 6342, 4156, and 3449 specimens. The flower genera that were popular with the most species of bees were *Phacelia*, *Penstemon*, and *Ericameria*, hosting a total of 180, 168, and 140 unique bee species. See Tables 1 and 2 for more details.

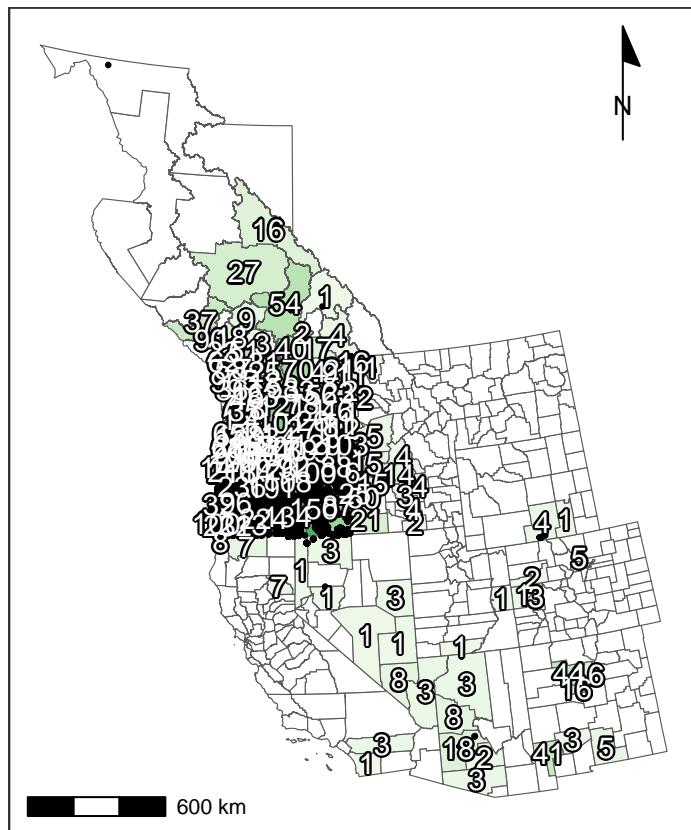


Figure 10: Recorded number of flower genera per county.



Table 2: Number of bee species collected from each plant genus

Genus	Count	Genus	Count	Genus	Count	Genus	Count	Genus	Count	Genus	Count	Genus	Count	Genus	Count
<i>Phacelia</i>	180	<i>Angelica</i>	40	<i>Alcea</i>	18	<i>Coriandrum</i>	10	<i>Alyssum</i>	5	<i>Abronia</i>	3	<i>Achlys</i>	1		
<i>Penstemon</i>	168	<i>Bellis</i>	40	<i>Antennaria</i>	18	<i>Cynara</i>	10	<i>Baptisia</i>	5	<i>Aliciella</i>	3	<i>Actinidia</i>	1		
<i>Ericameria</i>	140	<i>Collomia</i>	40	<i>Arbutus</i>	18	<i>Dicentra</i>	10	<i>Canadanthus</i>	5	<i>Anthriscus</i>	3	<i>Allotropa</i>	1		
<i>Grindelia</i>	133	<i>Marrubium</i>	40	<i>Caragana</i>	18	<i>Centaurium</i>	9	<i>Croton</i>	5	<i>Armeria</i>	3	<i>Alnus</i>	1		
<i>Rubus</i>	131	<i>Onopordum</i>	40	<i>Cosmos</i>	18	<i>Erythronium</i>	9	<i>Delosperma</i>	9	<i>Asparagus</i>	3	<i>Alstroemeria</i>	1		
<i>Cirsium</i>	130	<i>Lonicera</i>	39	<i>Hesperochiron</i>	18	<i>Euonymus</i>	9	<i>Diplacus</i>	5	<i>Astrantia</i>	3	<i>Amaranthus</i>	1		
<i>Potentilla</i>	124	<i>Cryptantha</i>	38	<i>Hieracium</i>	18	<i>Hydrangea</i>	9	<i>Galanthus</i>	5	<i>Bassia</i>	3	<i>Anemone</i>	1		
<i>Eriophyllum</i>	123	<i>Daspipora</i>	38	<i>Lactuca</i>	18	<i>Leptosiphon</i>	9	<i>Glandora</i>	5	<i>Boechera</i>	3	<i>Anethum</i>	1		
<i>Erigeron</i>	121	<i>Heraldeum</i>	38	<i>Lamium</i>	18	<i>Narcissus</i>	9	<i>Heliotropium</i>	5	<i>Brunnera</i>	3	<i>Arctium</i>	1		
<i>Solidago</i>	119	<i>Raphanus</i>	38	<i>Lasthenia</i>	18	<i>Oreocarya</i>	9	<i>Isatis</i>	5	<i>Capsella</i>	3	<i>Argemone</i>	1		
<i>Sympyotrichum</i>	119	<i>Dicteria</i>	37	<i>Ligusticum</i>	18	<i>Petrosedum</i>	9	<i>Kalmia</i>	5	<i>Centromadia</i>	3	<i>Atriplex</i>	1		
<i>Melilotus</i>	117	<i>Medicago</i>	37	<i>Linum</i>	18	<i>Platanthera</i>	9	<i>Leucophysalis</i>	5	<i>Chrysopsis</i>	3	<i>Aucuba</i>	1		
<i>Ceanothus</i>	115	<i>Anthemis</i>	36	<i>Adelinia</i>	17	<i>Salsola</i>	9	<i>Matriaria</i>	5	<i>Cirsaea</i>	3	<i>Begonia</i>	1		
<i>Lupinus</i>	111	<i>Tanacetum</i>	36	<i>Calystegia</i>	17	<i>Serphularia</i>	9	<i>Aesculus</i>	4	<i>Clinopodium</i>	3	<i>Betonica</i>	1		
<i>Eriogonum</i>	109	<i>Crataegus</i>	35	<i>Columbiadioria</i>	17	<i>Aconitum</i>	8	<i>Ajuga</i>	4	<i>Conioselinum</i>	3	<i>Betula</i>	1		
<i>Trifolium</i>	109	<i>Claytonia</i>	34	<i>Cotoneaster</i>	17	<i>Aronia</i>	8	<i>Aruncus</i>	4	<i>Crassula</i>	3	<i>Buxus</i>	1		
<i>Chrysanthemus</i>	108	<i>Eriodictyon</i>	34	<i>Downingia</i>	17	<i>Bellardia</i>	8	<i>Asperugo</i>	4	<i>Cucumis</i>	3	<i>Calicotropis</i>	1		
<i>Salix</i>	105	<i>Hydrophyllum</i>	34	<i>Erysimum</i>	17	<i>Calluna</i>	8	<i>Cakile</i>	4	<i>Cymopterus</i>	3	<i>Calibrachoa</i>	1		
<i>Calochortus</i>	103	<i>Oenothera</i>	34	<i>Poeticulum</i>	17	<i>Cardamine</i>	8	<i>Calandrinia</i>	4	<i>Dahlia</i>	3	<i>Calliandra</i>	1		
<i>Chamaenerion</i>	103	<i>Amniscinia</i>	33	<i>Hirschfeldia</i>	17	<i>Cercis</i>	8	<i>Choisya</i>	4	<i>Datura</i>	3	<i>Calocedrus</i>	1		
<i>Achillea</i>	98	<i>Castilleja</i>	33	<i>Linaria</i>	17	<i>Chorispora</i>	8	<i>Cistus</i>	4	<i>Deutzia</i>	3	<i>Carex</i>	1		
<i>Centaura</i>	98	<i>Corius</i>	33	<i>Persicaria</i>	17	<i>Cuscuta</i>	8	<i>Cordylanthus</i>	4	<i>Actaea</i>	2	<i>Catalpa</i>	1		
<i>Senecio</i>	96	<i>Descurainia</i>	33	<i>Viburnum</i>	17	<i>Elaeagnus</i>	8	<i>Damasonium</i>	4	<i>Aegopodium</i>	2	<i>Cerinthe</i>	1		
<i>Ribes</i>	95	<i>Dipascus</i>	33	<i>Dichelostemma</i>	16	<i>Escallonia</i>	8	<i>Distichlis</i>	4	<i>Allophylum</i>	2	<i>Chaenomeles</i>	1		
<i>Rosa</i>	90	<i>Rhus</i>	33	<i>Kolkwitzia</i>	16	<i>Hemizonella</i>	8	<i>Draba</i>	4	<i>Apium</i>	2	<i>Chamaemelum</i>	1		
<i>Geranium</i>	87	<i>Amelanchier</i>	32	<i>Lapsana</i>	16	<i>Jasmea</i>	8	<i>Eruga</i>	4	<i>Arum</i>	2	<i>Chimaphila</i>	1		
<i>Leucanthemum</i>	86	<i>Marath</i>	32	<i>Leontodon</i>	16	<i>Lobularia</i>	8	<i>Hemerocallis</i>	4	<i>Bauhinia</i>	2	<i>Clintonia</i>	1		
<i>Helianthus</i>	84	<i>Oreasteria</i>	32	<i>Mertensia</i>	16	<i>Pteris</i>	8	<i>Hesperis</i>	4	<i>Beta</i>	2	<i>Cormus</i>	1		
<i>Prunus</i>	84	<i>Sphaeralcea</i>	32	<i>Nothochelone</i>	16	<i>Robinia</i>	8	<i>Hibiscus</i>	4	<i>Bromus</i>	2	<i>Corydalis</i>	1		
<i>Spiraea</i>	84	<i>Coreopsis</i>	31	<i>Stephanomeria</i>	16	<i>Tonella</i>	8	<i>Hylotelephium</i>	4	<i>Camellia</i>	2	<i>Corylus</i>	1		
<i>Vicia</i>	84	<i>Delphinium</i>	31	<i>Styraz</i>	16	<i>Weigela</i>	8	<i>Inula</i>	4	<i>Cardionema</i>	2	<i>Cypripedium</i>	1		
<i>Allium</i>	82	<i>Philadelphus</i>	31	<i>Blepharipappus</i>	15	<i>Zinnia</i>	8	<i>Lagerstroemia</i>	4	<i>Castanea</i>	2	<i>Elymus</i>	1		
<i>Camassia</i>	81	<i>Thymys</i>	31	<i>Crocidium</i>	15	<i>Abelia</i>	7	<i>Layia</i>	4	<i>Celosia</i>	2	<i>Eremothera</i>	1		
<i>Sidalcea</i>	80	<i>Vaccinium</i>	31	<i>Echinacea</i>	15	<i>Agapanthus</i>	7	<i>Luetkea</i>	4	<i>Centranthus</i>	2	<i>Fagus</i>	1		
<i>Arctostaphylos</i>	79	<i>Acer</i>	30	<i>Ilex</i>	15	<i>Anomorpha</i>	7	<i>Melissa</i>	4	<i>Comandra</i>	2	<i>Filipendula</i>	1		
<i>Taraxacum</i>	79	<i>Carduus</i>	30	<i>Microseris</i>	15	<i>Aralia</i>	7	<i>Minimus</i>	4	<i>Crocosmia</i>	2	<i>Forsythia</i>	1		
<i>Hypocharaeis</i>	78	<i>Frasera</i>	30	<i>Pyracoma</i>	15	<i>Cerastium</i>	7	<i>Muscari</i>	4	<i>Crocus</i>	2	<i>Premontodendron</i>	1		
<i>Plagiothecys</i>	78	<i>Monarda</i>	30	<i>Trichostema</i>	15	<i>Conium</i>	7	<i>Narthecium</i>	4	<i>Cydonia</i>	2	<i>Fuchsia</i>	1		
<i>Salvia</i>	77	<i>Polemonium</i>	30	<i>Boorage</i>	14	<i>Cotinus</i>	7	<i>Nasturtium</i>	4	<i>Danthonia</i>	2	<i>Glechoma</i>	1		
<i>Balsamorhiza</i>	75	<i>Illyama</i>	29	<i>Collomia</i>	14	<i>Doronicum</i>	7	<i>Oenanthe</i>	4	<i>Daphne</i>	2	<i>Gnaphalium</i>	1		
<i>Lotus</i>	75	<i>Menzelia</i>	29	<i>Sonchus</i>	14	<i>Picaria</i>	7	<i>Ozalis</i>	4	<i>Dianthus</i>	2	<i>Graigia</i>	1		
<i>Symporicarpus</i>	75	<i>Nemophila</i>	29	<i>Stellaria</i>	14	<i>Glycyrhiza</i>	7	<i>Pastinaca</i>	4	<i>Dipterostemon</i>	2	<i>Helianthemum</i>	1		
<i>Lomatium</i>	72	<i>Mahonia</i>	28	<i>Tragopogon</i>	14	<i>Ipomopsis</i>	7	<i>Photinia</i>	4	<i>Echinocystis</i>	2	<i>Holcus</i>	1		
<i>Anaphalis</i>	71	<i>Viola</i>	28	<i>Artemisia</i>	13	<i>Lilium</i>	7	<i>Phyllodoce</i>	4	<i>Eucephalus</i>	2	<i>Hyacinthus</i>	1		
<i>Erythranthe</i>	71	<i>Myosotis</i>	27	<i>Campanula</i>	13	<i>Olsynium</i>	7	<i>Physalis</i>	4	<i>Eucryphia</i>	2	<i>Juglans</i>	1		
<i>Agastache</i>	69	<i>Purshia</i>	27	<i>Cercocarpus</i>	13	<i>Papaver</i>	7	<i>Pinus</i>	4	<i>Pestuca</i>	2	<i>Knautia</i>	1		
<i>Apocynum</i>	68	<i>Verbena</i>	27	<i>Chrysolepis</i>	13	<i>Pedicularis</i>	7	<i>Quercus</i>	4	<i>Garrya</i>	2	<i>Larrea</i>	1		
<i>Nepeta</i>	68	<i>Acniplis</i>	26	<i>Gayophytum</i>	13	<i>Pentaglottis</i>	7	<i>Reynoutria</i>	4	<i>Gratiola</i>	2	<i>Lepechinia</i>	1		
<i>Asclepias</i>	67	<i>Bistorta</i>	26	<i>Helianthella</i>	13	<i>Physaria</i>	7	<i>Rhamnus</i>	4	<i>Knapia</i>	2	<i>Leucocrinum</i>	1		
<i>Mentha</i>	66	<i>Euthamia</i>	26	<i>Oemleria</i>	13	<i>Populus</i>	7	<i>Scabiosa</i>	4	<i>Kopsiopsis</i>	2	<i>Leycesteria</i>	1		
<i>Ranunculus</i>	65	<i>Fagopyrum</i>	26	<i>Phlox</i>	13	<i>Sabulina</i>	7	<i>Swainsona</i>	4	<i>Lagophylla</i>	2	<i>Limonium</i>	1		
<i>Wyethia</i>	65	<i>Packera</i>	26	<i>Satureja</i>	13	<i>Scandix</i>	7	<i>Tithonia</i>	4	<i>Laurus</i>	2	<i>Linnaea</i>	1		
<i>Sisymbrium</i>	64	<i>Solanum</i>	26	<i>Sisyrinchium</i>	13	<i>Scutellaria</i>	7	<i>Tradescantia</i>	4	<i>Leucophyllum</i>	2	<i>Ludwigia</i>	1		
<i>Clarkia</i>	62	<i>Whipplea</i>	26	<i>Anchusa</i>	12	<i>Sinapis</i>	7	<i>Vancouveria</i>	4	<i>Ligularia</i>	2	<i>Lunaria</i>	1		
<i>Drymocallis</i>	62	<i>Dalea</i>	25	<i>Baccharis</i>	12	<i>Teucrium</i>	12	<i>Populus</i>	7	<i>Veronicastrum</i>	4	<i>Liquetum</i>	2	<i>Lycopus</i>	1
<i>Jacobaea</i>	62	<i>Doellingeria</i>	25	<i>Antirrhinum</i>	6	<i>Arenaria</i>	6	<i>Frauinus</i>	3	<i>Lysimachia</i>	2	<i>Machaeranthera</i>	1		
<i>Eschscholzia</i>	61	<i>Erodium</i>	25	<i>Caryopteris</i>	12	<i>Hydrophyllum</i>	6	<i>Helleborus</i>	3	<i>Parkinsonia</i>	2	<i>Magnolia</i>	1		
<i>Gilia</i>	61	<i>Polygonum</i>	25	<i>Heterotheca</i>	12	<i>Gentiana</i>	6	<i>Hemispiraea</i>	3	<i>Parthenocissus</i>	2	<i>Malaleuca</i>	1		
<i>Plectritis</i>	61	<i>Syringo</i>	25	<i>Lithophragma</i>	12	<i>Artemisia</i>	6	<i>Hastingsia</i>	6	<i>Parthenocissus</i>	2	<i>Nymphaea</i>	1		
<i>Hackelia</i>	59	<i>Calendula</i>	24	<i>Eremogone</i>	12	<i>Aurinia</i>	6	<i>Hippocratea</i>	3	<i>Patrinia</i>	2	<i>Moenchia</i>	1		
<i>Rudbeckia</i>	59	<i>Cucurbita</i>	24	<i>Erica</i>	12	<i>Buddleja</i>	6	<i>Hyssopus</i>	6	<i>Pedioicus</i>	2	<i>Ochnosia</i>	1		
<i>Sedum</i>	59	<i>Aquilegia</i>	23	<i>Eryngium</i>	12	<i>Caltha</i>	6	<i>Iva</i>	3	<i>Pedicularis</i>	2	<i>Osteospermum</i>	1		
<i>Holodiscus</i>	58	<i>Calyptridium</i>	23	<i>Eurybia</i>	12	<i>Kickxia</i>	6	<i>Impatiens</i>	3	<i>Petunia</i>	2	<i>Nymphoea</i>	1		
<i>Thelypodium</i>	58	<i>Cleomella</i>	23	<i>Heterotheca</i>	12	<i>Kybosia</i>	6	<i>Linaria</i>	6	<i>Phoenicurus</i>	2	<i>Onobrychis</i>	1		
<i>Brassica</i>	57	<i>Cytisus</i>	23	<i>Lithophragma</i>	12	<i>Hippocratea</i>	6	<i>Hedysarum</i>	6	<i>Parthenocissus</i>	2	<i>Ocimum</i>	1		
<i>Heliumium</i>	56	<i>Hosackia</i>	23	<i>Navarretia</i>	12	<i>Holopogon</i>	6	<i>Hibiscus</i>	3	<i>Patrinia</i>	2	<i>Obionebrichis</i>	1		
<i>Horkelia</i>	53	<i>Malva</i>	23	<i>Opuntia</i>	12	<i>Iridomyces</i>	6	<i>Littodora</i>	6	<i>Pedicularis</i>	2	<i>Pedioicus</i>	2		
<i>Monardella</i>	53	<i>Ageratina</i>	22	<i>Ruppertia</i>	12	<i>Hyssopus</i>	6	<i>Mispates</i>	3	<i>Pedicularis</i>	2	<i>Plospodium</i>	1		
<i>Crepis</i>	52	<i>Agoseris</i>	22	<i>Spergularia</i>	12	<i>Vernonia</i>	6	<i>Montia</i>	3	<i>Petroselinum</i>	3	<i>Petunia</i>	2	<i>Osteospermum</i>	1
<i>Lepidium</i>	52	<i>Brodiaea</i>	22	<i>Teucrium</i>	12	<i>Senecalia</i>	6	<i>Mutarda</i>	3	<i>Petroselinum</i>	3	<i>Nymphoea</i>	1		
<i>Hypericum</i>	51	<i>Perideria</i>	22	<i>Valeriana</i>	12	<i>Xerophyllum</i>	6	<i>Pyrola</i>	3	<i>Petroselinum</i>	3	<i>Nymphoea</i>	1		
<i>Lavandula</i>	51	<i>Stachys</i>	22	<i>Alisma</i>	11	<i>Xerophyllum</i>	6	<i>Scirpus</i>	3	<i>Petroselinum</i>	3	<i>Onobrychis</i>	1		
<i>Berberis</i>	50	<i>Cynoglossum</i>	21	<i>Arabis</i>	11	<i>Notholothocarpus</i>	6	<i>Minuartia</i>	3	<i>Petroselinum</i>	3	<i>Petroselinum</i>	1		
<i>Chaenactis</i>	50	<i>Euphorbia</i>	21	<i>Chamaebatiaria</i>	11	<i>Scouleria</i>	6	<i>Patula</i>	3	<i>Petroselinum</i>	3	<i>Petroselinum</i>	1		
<i>Gaillardia</i>	48	<i>Geum</i>	21	<i>Clematis</i>	11	<i>Pseudotsuga</i>	11	<i>Petasites</i>	3	<i>Petroselinum</i>	3	<i>Petroselinum</i>	1		
<i>Prunella</i>	48	<i>Bidens</i>	20	<i>Echium</i>	11	<i>Pyrola</i>	6	<i>Silphium</i>	2	<i>Pyrola</i>	3	<i>Pyrola</i>	1		
<i>Veronica</i>	48	<i>Frangula</i>	20	<i>Gaultheria</i>	11	<i>Scorzoneraoides</i>	6	<i>Smyrnium</i>	2	<i>Pyrola</i>	3	<i>Pyrola</i>	1		
<i>Lathyrus</i>	46	<i>Gutierrezia</i>	20	<i>Hyacinthoid</i>											



	Table 3: Number of bee specimens from each county, by genus. You may want to focus your sampling in under-sampled counties. (continued)																																											
Zacasmia	0	Asotin	Baker	Benton	Boundary	Canyon	Capital Regional District	Carbon	Cariboo Regional District	Chelan	Churchill	Clackamas	Columbia	Columbia Shuswap Regional District	Coos	Cowlitz	Crook	Curry	Custer	Del Norte	Deschutes	Douglas	Franklin	Gilliam	Grant	Grays Harbor	Hood River	Humboldt	Idaho	Jackson	Jefferson	Josephine	Kittitas	Klamath	Klickitat	Lake	Lane	Linn	Lincoln	Mahoeur	Maricopa	•		
TOTAL	10	2465	4833	126	10	7	34	1	1	2	2266	260	402	2168	1	201	3	3280	1196	107	33	9217	1178	69	595	3068	2	5933	3079	63	33	6616	2562	7338	2	6507	21	5375	6206	2508	1607	3137	22	4451



	Table 4: Number of bee specimens from each county, by species (continued)																																												
<i>Anthidium formosum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
<i>Anthidium illustre</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
<i>Anthidium maculosum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
<i>Anthidium manicatum</i>	0	0	28	0	0	0	0	0	0	0	6	1	0	2	3	0	0	13	0	0	0	0	0	0	1	3	0	0	2	6	10	20	0	0	10	32	0	0	10						
<i>Anthidium mormonum</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0	0	0	10	0	2	0	0	0	1	3	1	5	0	9	4	0	1	0	0	0						
<i>Anthidium oblongatum</i>	0	0	0	0	0	0	0	0	0	18	0	0	4	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthidium palliventre</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthidium placitum</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthidium tenuiflorae</i>	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	0	3	7	0	0	0	0	0	0	0	0	0	0							
<i>Anthidium utahense</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	2	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora affabilis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora albata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora bombooides</i>	0	5	0	0	0	0	0	0	0	3	0	0	1	0	0	0	1	3	0	0	0	4	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora californica</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora crotchii</i>	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora curta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora edwardsii</i>	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora exigua</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora maculifrons</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora pacifica</i>	0	10	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	11	0	0	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora peritomae</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora porterae</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophora terminalis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	2	0	0	0	2	0	7	9	0	0	11	0	0	5	0	0	1	0	0	0						
<i>Anthophora urbana</i>	0	7	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	36	3	0	199	7	6	18	34	0	114	1	0	4	139	14	45	66	0	205	33	0	10	131	0	9	0	6	0
<i>Anthophora ursina</i>	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Anthophorula chionura</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Apis mellifera</i>	0	1	77	2	0	0	0	0	42	29	16	9	0	5	5	35	0	0	30	49	8	1	4	0	79	0	0	34	3	58	58	0	5	23	29	37	15	4	73	0	0	9	0	0	0
<i>Ashmeadiella altadena</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Ashmeadiella bucconi</i>	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	6	0	0	0	7	0	11	0	0	0	0	0	0	0	0	0	1	0	0						
<i>Ashmeadiella cactorum</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Ashmeadiella californica</i>	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0	0	6	0	23	15	1	0	13	1	4	2	0	8	2	0	19	0	0	0	0			
<i>Ashmeadiella cubiceps</i>	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	3	0	8	5	0	1	6	0	0	0	0	4	1	0							
<i>Ashmeadiella difigua</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Ashmeadiella foveata</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Ashmeadiella foxiella</i>	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0							
<i>Ashmeadiella propodis</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Ashmeadiella timberlakei</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0							
<i>Atoposmia abjecta</i>	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Atoposmia anthodyta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Atoposmia copelandica</i>	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	1	0	0	13	0	6	0	0	5	5	0	0	2	0	0	0	0							
<i>Atoposmia elongata</i>	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Atoposmia oregonia</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0							
<i>Atoposmia triodonta</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0													













## 7 Taxonomic Accuracy, 2023

In 2023, you identified 1242 of your 1260 specimens to genus level and 366 to species level, with a genus-level identification accuracy of 94.3% and a species-level identification accuracy of 89.3% (see Table 5). In total, volunteers from the Oregon Bee Atlas project identified 44.3 % (10004) of the 22575 bee specimens to the level of genus, with an average accuracy of 94.5%. Volunteers also identified 8.4% (1887) of the specimens to species level, and had an average accuracy of 88.9% (see Table 6). Nicely done!

Table 5: Your determination accuracy in 2023.

	Taxon	Specimens ID-ed	Correct ID	% Correct
<b>Family</b>				
<i>Andrenidae</i>		189	188	99.5
<i>Apidae</i>		344	339	98.5
<i>Colletidae</i>		18	17	94.4
<i>Halictidae</i>		346	345	99.7
<i>Megachilidae</i>		342	328	95.9
<i>Melittidae</i>		3	0	0.0
<i>TOTAL</i>		1242	1217	98.0
<b>Genus</b>				
<i>Agapostemon</i>		4	4	100.0
<i>Andrena</i>		52	52	100.0
<i>Anthidiellum</i>		5	5	100.0
<i>Anthidium</i>		11	11	100.0
<i>Anthophora</i>		29	29	100.0
<i>Ashmeadiella</i>		13	13	100.0
<i>Atoposmia</i>		1	0	0.0
<i>Biastes</i>		1	1	100.0
<i>Bombus</i>		114	113	99.1
<i>Ceratina</i>		2	2	100.0
<i>Chelostoma</i>		1	0	0.0
<i>Coelioxys</i>		7	7	100.0
<i>Colletes</i>		8	7	87.5
<i>Diadasia</i>		41	38	92.7
<i>Dianthidium</i>		49	48	98.0
<i>Dufourea</i>		2	2	100.0
<i>Eucera</i>		12	12	100.0
<i>Halictus</i>		161	161	100.0
<i>Hesperapis</i>		3	0	0.0
<i>Holcopasites</i>		1	1	100.0
<i>Hoplitis</i>		12	10	83.3
<i>Hylaeus</i>		10	10	100.0
<i>Lasioglossum</i>		175	174	99.4
<i>Megachile</i>		102	98	96.1
<i>Melecta</i>		1	1	100.0
<i>Melissodes</i>		125	116	92.8
<i>Nomada</i>		15	14	93.3
<i>Osmia</i>		140	129	92.1
<i>Panurginus</i>		30	30	100.0
<i>Perdita</i>		99	68	68.7
<i>Protandrena</i>		8	7	87.5
<i>Sphecodes</i>		4	4	100.0
<i>Trachusa</i>		1	1	100.0
<i>Triepeolus</i>		3	3	100.0
<i>TOTAL</i>		1242	1171	94.3

Table 5: Your determination accuracy in 2023. (*continued*)

	Taxon	Specimens ID-ed	Correct ID	% Correct
Species				
<i>Anthidiellum robertsoni</i>		5	5	100.0
<i>Bombus appositus</i>		1	1	100.0
<i>Bombus caliginosus</i>		2	2	100.0
<i>Bombus centralis</i>		5	5	100.0
<i>Bombus fervidus</i>		7	7	100.0
<i>Bombus flavidus</i>		3	3	100.0
<i>Bombus flavifrons</i>		4	3	75.0
<i>Bombus frigidus</i>		1	0	0.0
<i>Bombus griseocollis</i>		18	18	100.0
<i>Bombus huntii</i>		9	9	100.0
<i>Bombus insularis</i>		2	1	50.0
<i>Bombus morrisoni</i>		1	1	100.0
<i>Bombus nevadensis</i>		6	5	83.3
<i>Bombus sitkensis</i>		2	1	50.0
<i>Bombus sylvicola</i>		6	0	0.0
<i>Bombus vancouverensis</i>		39	38	97.4
<i>Bombus vosnesenskii</i>		6	6	100.0
<i>Halictus confusus</i>		2	2	100.0
<i>Halictus farinosus</i>		8	6	75.0
<i>Halictus ligatus</i>		66	65	98.5
<i>Halictus tripartitus</i>		43	43	100.0
<i>Halictus virgatellus</i>		6	6	100.0
<i>Holcopasites pulchellus</i>		1	1	100.0
<i>Lasioglossum cooleyi</i>		22	0	0.0
<i>Lasioglossum cressonii</i>		1	1	100.0
<i>Lasioglossum diatretum</i>		1	1	100.0
<i>Lasioglossum diversopunctatum</i>		4	4	100.0
<i>Lasioglossum incompletum</i>		63	61	96.8
<i>Lasioglossum inconditum</i>		1	1	100.0
<i>Lasioglossum nevadense</i>		1	1	100.0
<i>Lasioglossum pruinosum</i>		4	4	100.0
<i>Lasioglossum pulveris</i>		2	2	100.0
<i>Lasioglossum rufulosense</i>		3	3	100.0
<i>Lasioglossum sisymbrii</i>		12	12	100.0
<i>Lasioglossum titusi</i>		8	8	100.0
<i>Trachusa timberlakei</i>		1	1	100.0
<b>TOTAL</b>		366	327	89.3

Table 6: Determination accuracy for all volunteers in 2023.

	Taxon	Specimens ID-ed	Correct ID	% Correct
Family				
<i>Andrenidae</i>		1172	1122	95.7
<i>Apidae</i>		3081	3040	98.7
<i>Colletidae</i>		422	396	93.8
<i>Halictidae</i>		2301	2270	98.7
<i>Megachilidae</i>		3025	2975	98.3
<i>Melittidae</i>		4	1	25.0
<b>TOTAL</b>		10005	9804	98.0
Genus				

Table 6: Determination accuracy for all volunteers in 2023. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Agapostemon</i>	86	86	100.0
<i>Andrena</i>	683	663	97.1
<i>Anthidiellum</i>	30	7	23.3
<i>Anthidium</i>	125	124	99.2
<i>Anthophora</i>	198	184	92.9
<i>Apis</i>	85	85	100.0
<i>Ashmeadiella</i>	58	47	81.0
<i>Atoposmia</i>	46	44	95.7
<i>Biastes</i>	3	3	100.0
<i>Bombus</i>	1671	1670	99.9
<i>Brachymelecta</i>	5	5	100.0
<i>Calliopsis</i>	21	10	47.6
<i>Ceratina</i>	274	269	98.2
<i>Chelostoma</i>	27	24	88.9
<i>Coelioxys</i>	43	42	97.7
<i>Colletes</i>	265	245	92.5
<i>Diadasia</i>	71	59	83.1
<i>Dianthidium</i>	97	78	80.4
<i>Dioxyx</i>	2	1	50.0
<i>Dufourea</i>	53	52	98.1
<i>Epeolus</i>	10	9	90.0
<i>Eucera</i>	60	57	95.0
<i>Habropoda</i>	49	47	95.9
<i>Halictus</i>	902	862	95.6
<i>Heriades</i>	40	29	72.5
<i>Hesperapis</i>	4	1	25.0
<i>Holcopasites</i>	1	1	100.0
<i>Hoplitis</i>	231	195	84.4
<i>Hylaeus</i>	157	151	96.2
<i>Lasioglossum</i>	1167	1105	94.7
<i>Megachile</i>	567	551	97.2
<i>Melecta</i>	21	20	95.2
<i>Melissodes</i>	370	322	87.0
<i>Micralictoides</i>	14	14	100.0
<i>Neolarra</i>	3	3	100.0
<i>Nomada</i>	207	201	97.1
<i>Osmia</i>	1670	1639	98.1
<i>Panurginus</i>	140	120	85.7
<i>Perdita</i>	319	249	78.1
<i>Protandrena</i>	8	7	87.5
<i>Protosmia</i>	48	33	68.8
<i>Pseudoanthidium</i>	4	1	25.0
<i>Sphecodes</i>	79	65	82.3
<i>Stelis</i>	31	21	67.7
<i>Trachusa</i>	6	5	83.3
<i>Triepeolus</i>	43	41	95.3
<i>Xylocopa</i>	10	9	90.0
<b>TOTAL</b>	10004	9456	94.5
<b>Species</b>			
<i>Anthidiellum robertsoni</i>	7	7	100.0
<i>Apis mellifera</i>	68	68	100.0

Table 6: Determination accuracy for all volunteers in 2023. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Bombus appositus</i>	8	7	87.5
<i>Bombus caliginosus</i>	32	24	75.0
<i>Bombus centralis</i>	43	38	88.4
<i>Bombus fervidus</i>	43	43	100.0
<i>Bombus flavidus</i>	23	22	95.7
<i>Bombus flavifrons</i>	57	54	94.7
<i>Bombus frigidus</i>	3	0	0.0
<i>Bombus griseocollis</i>	46	46	100.0
<i>Bombus huntii</i>	50	46	92.0
<i>Bombus insularis</i>	9	7	77.8
<i>Bombus kirbiellus</i>	1	0	0.0
<i>Bombus melanopygus</i>	42	20	47.6
<i>Bombus mixtus</i>	139	121	87.1
<i>Bombus morrisoni</i>	4	4	100.0
<i>Bombus nevadensis</i>	13	12	92.3
<i>Bombus occidentalis</i>	5	3	60.0
<i>Bombus rufocinctus</i>	6	4	66.7
<i>Bombus sitkensis</i>	29	15	51.7
<i>Bombus sylvicola</i>	45	14	31.1
<i>Bombus vagans</i>	4	2	50.0
<i>Bombus vancouverensis</i>	259	257	99.2
<i>Bombus vandykei</i>	31	24	77.4
<i>Bombus vosnesenskii</i>	269	252	93.7
<i>Brachymelecta californica</i>	3	3	100.0
<i>Ceratina pacifica</i>	1	0	0.0
<i>Halictus confusus</i>	35	28	80.0
<i>Halictus farinosus</i>	28	24	85.7
<i>Halictus ligatus</i>	208	207	99.5
<i>Halictus rubicundus</i>	16	15	93.8
<i>Halictus tripartitus</i>	108	107	99.1
<i>Halictus virgatellus</i>	7	6	85.7
<i>Holcopasites pulchellus</i>	1	1	100.0
<i>Lasioglossum anhypops</i>	3	3	100.0
<i>Lasioglossum aspilurum</i>	1	1	100.0
<i>Lasioglossum boreale</i>	2	2	100.0
<i>Lasioglossum cooleyi</i>	23	0	0.0
<i>Lasioglossum cressonii</i>	1	1	100.0
<i>Lasioglossum diatretum</i>	1	1	100.0
<i>Lasioglossum diversopunctatum</i>	4	4	100.0
<i>Lasioglossum glabriventre</i>	1	1	100.0
<i>Lasioglossum helianthi</i>	1	0	0.0
<i>Lasioglossum incompletum</i>	74	72	97.3
<i>Lasioglossum inconditum</i>	2	2	100.0
<i>Lasioglossum kincaidii</i>	2	2	100.0
<i>Lasioglossum nevadense</i>	1	1	100.0
<i>Lasioglossum olympiae</i>	1	1	100.0
<i>Lasioglossum ovaliceps</i>	5	5	100.0
<i>Lasioglossum pavonotum</i>	10	10	100.0
<i>Lasioglossum pruinosum</i>	4	4	100.0
<i>Lasioglossum pulveris</i>	6	6	100.0
<i>Lasioglossum quebecense</i>	1	0	0.0

Table 6: Determination accuracy for all volunteers in 2023. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Lasioglossum ruidosense</i>	3	3	100.0
<i>Lasioglossum sisymbrii</i>	19	19	100.0
<i>Lasioglossum titusi</i>	24	20	83.3
<i>Lasioglossum zephyrus</i>	1	1	100.0
<i>Lasioglossum zonulum</i>	4	4	100.0
<i>Megachile perihirta</i>	1	0	0.0
<i>Micralictoides ruficaudus</i>	14	14	100.0
<i>Osmia atrocyanea</i>	1	0	0.0
<i>Osmia brevis</i>	2	0	0.0
<i>Osmia coloradensis</i>	1	0	0.0
<i>Osmia cyanella</i>	3	0	0.0
<i>Osmia densa</i>	5	0	0.0
<i>Osmia sculleni</i>	3	0	0.0
<i>Protosmia rubifloris</i>	15	15	100.0
<i>Trachusa timberlakei</i>	5	5	100.0
<i>TOTAL</i>	1887	1678	88.9

## 8 Taxonomic Accuracy, All Years

Over your time in the Atlas you identified 5392 of your 8596 specimens to genus level and 2334 to species level, with a genus-level identification accuracy of 97.8% and a species-level identification accuracy of 91.1% (see Table 7). In total, volunteers from the Oregon Bee Atlas project identified 44.8 % (53383) of the 119209 bee specimens to the level of genus, with an average accuracy of 94.2%. Volunteers also identified 11.2% (13400) of the specimens to species level, and had an average accuracy of 89.9% (see Table 8). Nicely done!

Table 7: Your determination accuracy.

	Taxon	Specimens ID-ed	Correct ID	% Correct
<b>Family</b>				
<i>Andrenidae</i>	633	631	99.7	
<i>Apidae</i>	1815	1808	99.6	
<i>Colletidae</i>	208	198	95.2	
<i>Halictidae</i>	1717	1714	99.8	
<i>Megachilidae</i>	1016	1001	98.5	
<i>Melittidae</i>	3	0	0.0	
<i>TOTAL</i>	5392	5352	99.3	
<b>Genus</b>				
<i>Agapostemon</i>	175	173	98.9	
<i>Andrena</i>	328	327	99.7	
<i>Anthidiellum</i>	9	9	100.0	
<i>Anthidium</i>	32	32	100.0	
<i>Anthophora</i>	259	254	98.1	
<i>Apis</i>	5	5	100.0	
<i>Ashmeadiella</i>	95	95	100.0	
<i>Atoposmia</i>	6	5	83.3	
<i>Biastes</i>	1	1	100.0	
<i>Bombus</i>	682	679	99.6	
<i>Brachymelecta</i>	26	26	100.0	
<i>Calliopsis</i>	7	7	100.0	
<i>Ceratina</i>	190	189	99.5	
<i>Chelostoma</i>	6	5	83.3	
<i>Coelioxys</i>	24	24	100.0	
<i>Colletes</i>	92	83	90.2	
<i>Diadasia</i>	146	142	97.3	
<i>Dianthidium</i>	116	115	99.1	
<i>Dufourea</i>	4	4	100.0	
<i>Epeolus</i>	5	5	100.0	
<i>Eucera</i>	81	80	98.8	
<i>Habropoda</i>	2	1	50.0	
<i>Halictus</i>	782	776	99.2	
<i>Heriades</i>	3	3	100.0	
<i>Hesperapis</i>	3	0	0.0	
<i>Holcopasites</i>	1	1	100.0	
<i>Hoplitis</i>	39	36	92.3	
<i>Hylaeus</i>	116	115	99.1	
<i>Lasioglossum</i>	707	706	99.9	
<i>Megachile</i>	268	263	98.1	
<i>Melecta</i>	2	2	100.0	
<i>Melissodes</i>	324	309	95.4	
<i>Nomada</i>	50	49	98.0	
<i>Osmia</i>	385	374	97.1	
<i>Panurginus</i>	41	41	100.0	

Table 7: Your determination accuracy. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Perdita</i>	247	216	87.4
<i>Protandrena</i>	10	9	90.0
<i>Protosmia</i>	27	27	100.0
<i>Sphecodes</i>	49	40	81.6
<i>Stelis</i>	5	5	100.0
<i>Trachusa</i>	1	1	100.0
<i>Triepeolus</i>	41	41	100.0
<b>TOTAL</b>	5392	5275	97.8
<b>Species</b>			
<i>Agapostemon femoratus</i>	56	53	94.6
<i>Agapostemon melliventris</i>	9	9	100.0
<i>Agapostemon subtilior</i>	82	78	95.1
<i>Agapostemon virescens</i>	23	13	56.5
<i>Andrena prunorum</i>	6	6	100.0
<i>Anthidiellum robertsoni</i>	9	9	100.0
<i>Anthidium atrifrons</i>	2	2	100.0
<i>Anthidium emarginatum</i>	1	0	0.0
<i>Anthidium manicatum</i>	3	3	100.0
<i>Anthidium mormonum</i>	1	1	100.0
<i>Anthidium placitum</i>	1	1	100.0
<i>Anthophora urbana</i>	140	140	100.0
<i>Apis mellifera</i>	5	5	100.0
<i>Ashmeadiella aridula</i>	1	0	0.0
<i>Ashmeadiella cubiceps</i>	2	1	50.0
<i>Ashmeadiella difugita</i>	1	0	0.0
<i>Atoposmia copelandica</i>	4	4	100.0
<i>Bombus appositus</i>	8	5	62.5
<i>Bombus caliginosus</i>	5	5	100.0
<i>Bombus centralis</i>	40	38	95.0
<i>Bombus fervidus</i>	63	62	98.4
<i>Bombus flavidus</i>	9	9	100.0
<i>Bombus flavifrons</i>	52	31	59.6
<i>Bombus frigidus</i>	1	0	0.0
<i>Bombus griseocollis</i>	37	37	100.0
<i>Bombus huntii</i>	19	17	89.5
<i>Bombus insularis</i>	5	2	40.0
<i>Bombus melanopygus</i>	29	25	86.2
<i>Bombus mixtus</i>	74	73	98.6
<i>Bombus morrisoni</i>	2	2	100.0
<i>Bombus nevadensis</i>	23	20	87.0
<i>Bombus occidentalis</i>	5	5	100.0
<i>Bombus rufocinctus</i>	10	8	80.0
<i>Bombus sitkensis</i>	40	34	85.0
<i>Bombus sylvicola</i>	10	1	10.0
<i>Bombus vagans</i>	3	0	0.0
<i>Bombus vancouverensis</i>	109	105	96.3
<i>Bombus vandykei</i>	4	3	75.0
<i>Bombus vosnesenskii</i>	106	99	93.4
<i>Brachymelecta californica</i>	27	25	92.6
<i>Calliopsis zonalis</i>	1	0	0.0
<i>Ceratina acantha</i>	127	127	100.0
<i>Ceratina micheneri</i>	22	22	100.0

Table 7: Your determination accuracy. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Ceratina nanula</i>	1	1	100.0
<i>Ceratina pacifica</i>	3	3	100.0
<i>Diadasia australis</i>	3	3	100.0
<i>Diadasia diminuta</i>	8	8	100.0
<i>Diadasia enavata</i>	79	78	98.7
<i>Diadasia lutzi</i>	8	2	25.0
<i>Diadasia opuntiae</i>	6	0	0.0
<i>Dianthidium curvatum</i>	18	18	100.0
<i>Dianthidium heterulkei</i>	7	0	0.0
<i>Dianthidium pudicum</i>	11	11	100.0
<i>Dianthidium subparvum</i>	3	3	100.0
<i>Dianthidium ulkei</i>	20	14	70.0
<i>Eucera actuosa</i>	3	2	66.7
<i>Eucera speciosa</i>	19	0	0.0
<i>Habropoda tristissima</i>	1	1	100.0
<i>Halictus confusus</i>	13	11	84.6
<i>Halictus farinosus</i>	66	63	95.5
<i>Halictus ligatus</i>	352	345	98.0
<i>Halictus rubicundus</i>	39	37	94.9
<i>Halictus tripartitus</i>	239	233	97.5
<i>Halictus virgatellus</i>	6	6	100.0
<i>Holcopasites pulchellus</i>	1	1	100.0
<i>Hoplitis producta</i>	1	0	0.0
<i>Hylaeus mesillae</i>	1	0	0.0
<i>Lasioglossum colatum</i>	1	1	100.0
<i>Lasioglossum cooleyi</i>	22	0	0.0
<i>Lasioglossum cressonii</i>	4	4	100.0
<i>Lasioglossum diatretum</i>	1	1	100.0
<i>Lasioglossum diversopunctatum</i>	4	4	100.0
<i>Lasioglossum glabriventre</i>	1	1	100.0
<i>Lasioglossum imbrex</i>	7	0	0.0
<i>Lasioglossum incompletum</i>	63	61	96.8
<i>Lasioglossum inconditum</i>	1	1	100.0
<i>Lasioglossum kincaidii</i>	2	2	100.0
<i>Lasioglossum nevadense</i>	1	1	100.0
<i>Lasioglossum olympiae</i>	6	6	100.0
<i>Lasioglossum ovaliceps</i>	4	4	100.0
<i>Lasioglossum pruinosum</i>	4	4	100.0
<i>Lasioglossum pulveris</i>	2	2	100.0
<i>Lasioglossum ruidosense</i>	3	3	100.0
<i>Lasioglossum sisymbrii</i>	46	46	100.0
<i>Lasioglossum titusi</i>	20	20	100.0
<i>Megachile angelarum</i>	2	2	100.0
<i>Megachile apicalis</i>	4	4	100.0
<i>Megachile mellitarsis</i>	3	3	100.0
<i>Megachile perihirta</i>	1	1	100.0
<i>Megachile wheeleri</i>	4	4	100.0
<i>Melecta thoracica</i>	1	0	0.0
<i>Osmia aglaia</i>	9	0	0.0
<i>Osmia bruneri</i>	1	1	100.0
<i>Protosmia rubifloris</i>	27	27	100.0
<i>Trachusa timberlakei</i>	1	1	100.0

Table 7: Your determination accuracy. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Triepelous concavus</i>	2	2	100.0
<i>Triepelous utahensis</i>	2	0	0.0
<b>TOTAL</b>	2334	2126	91.1

Table 8: Determination accuracy for all volunteers.

Taxon	Specimens ID-ed	Correct ID	% Correct
<b>Family</b>			
<i>Andrenidae</i>	6809	6082	89.3
<i>Apidae</i>	17689	17450	98.6
<i>Colletidae</i>	2862	2695	94.2
<i>Halictidae</i>	14546	14336	98.6
<i>Megachilidae</i>	11503	11342	98.6
<i>Melittidae</i>	4	1	25.0
<b>TOTAL</b>	53413	51906	97.2
<b>Genus</b>			
<i>Agapostemon</i>	967	963	99.6
<i>Andrena</i>	4756	4156	87.4
<i>Anthidiellum</i>	58	26	44.8
<i>Anthidium</i>	545	538	98.7
<i>Anthophora</i>	1229	1160	94.4
<i>Apis</i>	594	585	98.5
<i>Ashmeadiella</i>	352	294	83.5
<i>Atoposmia</i>	137	93	67.9
<i>Biastes</i>	8	6	75.0
<i>Bombus</i>	7793	7765	99.6
<i>Brachymelecta</i>	95	71	74.7
<i>Calliopsis</i>	99	58	58.6
<i>Ceratina</i>	2980	2932	98.4
<i>Chelostoma</i>	82	63	76.8
<i>Coelioxys</i>	154	145	94.2
<i>Colletes</i>	1350	1232	91.3
<i>Diadasia</i>	368	322	87.5
<i>Dianthidium</i>	314	280	89.2
<i>Dioxys</i>	6	3	50.0
<i>Dufourea</i>	260	217	83.5
<i>Epeorus</i>	61	43	70.5
<i>Eucera</i>	636	584	91.8
<i>Habropoda</i>	278	258	92.8
<i>Halictus</i>	5639	5408	95.9
<i>Heriades</i>	223	179	80.3
<i>Hesperapis</i>	4	1	25.0
<i>Holcopasites</i>	1	1	100.0
<i>Hoplitis</i>	754	610	80.9
<i>Hylaeus</i>	1511	1461	96.7
<i>Lasioglossum</i>	7205	6842	95.0
<i>Megachile</i>	2311	2255	97.6
<i>Melecta</i>	72	69	95.8
<i>Melissodes</i>	2102	1914	91.1
<i>Micralictoides</i>	16	14	87.5
<i>Neolarra</i>	3	3	100.0

Table 8: Determination accuracy for all volunteers. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Nomada</i>	1220	1164	95.4
<i>Nomia</i>	2	2	100.0
<i>Oreopasites</i>	3	0	0.0
<i>Osmia</i>	6182	6070	98.2
<i>Panurginus</i>	750	567	75.6
<i>Perdita</i>	1163	1076	92.5
<i>Protandrena</i>	27	9	33.3
<i>Protosmia</i>	268	212	79.1
<i>Pseudoanthidium</i>	6	3	50.0
<i>Sphecodes</i>	455	355	78.0
<i>Stelis</i>	97	64	66.0
<i>Trachusa</i>	8	7	87.5
<i>Triepeolus</i>	176	147	83.5
<i>Xylocopa</i>	62	60	96.8
<i>Zacosmia</i>	1	1	100.0
<b>TOTAL</b>	53383	50288	94.2
<b>Species</b>			
<i>Agapostemon femoratus</i>	182	172	94.5
<i>Agapostemon melliventris</i>	14	14	100.0
<i>Agapostemon subtilior</i>	228	214	93.9
<i>Agapostemon virescens</i>	109	95	87.2
<i>Andrena angustitarsata</i>	18	18	100.0
<i>Andrena astragali</i>	1	1	100.0
<i>Andrena chlorogaster</i>	2	2	100.0
<i>Andrena crataegi</i>	1	1	100.0
<i>Andrena cupreatincta</i>	14	14	100.0
<i>Andrena fuscicauda</i>	2	2	100.0
<i>Andrena illinoiensis</i>	1	1	100.0
<i>Andrena nigrocaerulea</i>	2	2	100.0
<i>Andrena pallidifovea</i>	1	1	100.0
<i>Andrena perplexa</i>	1	1	100.0
<i>Andrena piperi</i>	3	2	66.7
<i>Andrena prunorum</i>	34	34	100.0
<i>Andrena salicifloris</i>	2	2	100.0
<i>Andrena vicina</i>	4	3	75.0
<i>Andrena washingtoni</i>	1	0	0.0
<i>Anthidiellum robertsoni</i>	19	19	100.0
<i>Anthidium atrifrons</i>	3	3	100.0
<i>Anthidium banningense</i>	5	5	100.0
<i>Anthidium duomarginatum</i>	1	0	0.0
<i>Anthidium emarginatum</i>	5	0	0.0
<i>Anthidium manicatum</i>	53	44	83.0
<i>Anthidium mormonum</i>	12	12	100.0
<i>Anthidium oblongatum</i>	14	14	100.0
<i>Anthidium palliventre</i>	31	28	90.3
<i>Anthidium placitum</i>	1	1	100.0
<i>Anthidium tenuiflorae</i>	2	2	100.0
<i>Anthidium utahense</i>	3	3	100.0
<i>Anthophora bomboides</i>	3	3	100.0
<i>Anthophora californica</i>	1	0	0.0
<i>Anthophora neglecta</i>	3	0	0.0
<i>Anthophora pacifica</i>	3	3	100.0

Table 8: Determination accuracy for all volunteers. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Anthophora urbana</i>	251	249	99.2
<i>Anthophora ursina</i>	2	0	0.0
<i>Apis mellifera</i>	492	488	99.2
<i>Ashmeadiella aridula</i>	1	0	0.0
<i>Ashmeadiella californica</i>	1	1	100.0
<i>Ashmeadiella clypeodenata</i>	1	0	0.0
<i>Ashmeadiella cubiceps</i>	2	1	50.0
<i>Ashmeadiella difugita</i>	1	0	0.0
<i>Ashmeadiella eurynorhyncha</i>	1	0	0.0
<i>Ashmeadiella timberlakei</i>	1	1	100.0
<i>Atoposmia abjecta</i>	3	3	100.0
<i>Atoposmia copelandica</i>	6	6	100.0
<i>Atoposmia oregonia</i>	4	3	75.0
<i>Atoposmia triodonta</i>	1	0	0.0
<i>Bombus Griseocollis</i>	1	0	0.0
<i>Bombus Mixtus</i>	8	0	0.0
<i>Bombus Nevadensis</i>	1	0	0.0
<i>Bombus appositus</i>	48	36	75.0
<i>Bombus caliginosus</i>	340	271	79.7
<i>Bombus centralis</i>	201	187	93.0
<i>Bombus fervidus</i>	364	327	89.8
<i>Bombus flavidus</i>	145	134	92.4
<i>Bombus flavifrons</i>	541	455	84.1
<i>Bombus frigidus</i>	5	0	0.0
<i>Bombus griseocollis</i>	140	138	98.6
<i>Bombus huntii</i>	160	139	86.9
<i>Bombus insularis</i>	33	25	75.8
<i>Bombus kirbiellus</i>	1	0	0.0
<i>Bombus melanopygus</i>	324	270	83.3
<i>Bombus mixtus</i>	953	875	91.8
<i>Bombus morrisoni</i>	11	10	90.9
<i>Bombus nevadensis</i>	65	58	89.2
<i>Bombus occidentalis</i>	33	27	81.8
<i>Bombus rufocinctus</i>	58	36	62.1
<i>Bombus sitkensis</i>	195	147	75.4
<i>Bombus suckleyi</i>	2	0	0.0
<i>Bombus sylvicola</i>	69	31	44.9
<i>Bombus vagans</i>	24	8	33.3
<i>Bombus vancouverensis</i>	836	809	96.8
<i>Bombus vandykei</i>	85	62	72.9
<i>Bombus vosnesenskii</i>	1373	1279	93.2
<i>Brachymelecta californica</i>	45	43	95.6
<i>Calliopsis zonalis</i>	1	0	0.0
<i>Ceratina acantha</i>	679	665	97.9
<i>Ceratina micheneri</i>	44	43	97.7
<i>Ceratina nanula</i>	3	2	66.7
<i>Ceratina neomexicana</i>	1	1	100.0
<i>Ceratina pacifica</i>	13	6	46.2
<i>Ceratina sequoiae</i>	5	0	0.0
<i>Ceratina tejonensis</i>	7	2	28.6
<i>Ceratina timberlakei</i>	5	0	0.0
<i>Chelostoma minutum</i>	1	1	100.0

Table 8: Determination accuracy for all volunteers. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Coelioxys alternatus</i>	1	0	0.0
<i>Coelioxys rufitarsis</i>	4	0	0.0
<i>Coelioxys sayi</i>	2	2	100.0
<i>Coelioxys texanus</i>	4	0	0.0
<i>Diadasia angusticeps</i>	7	7	100.0
<i>Diadasia australis</i>	4	4	100.0
<i>Diadasia diminuta</i>	17	17	100.0
<i>Diadasia enavata</i>	100	99	99.0
<i>Diadasia lutzi</i>	28	6	21.4
<i>Diadasia nigrifrons</i>	9	9	100.0
<i>Diadasia opuntiae</i>	8	0	0.0
<i>Dianthidium curvatum</i>	22	22	100.0
<i>Dianthidium heterulkei</i>	9	0	0.0
<i>Dianthidium pudicum</i>	12	12	100.0
<i>Dianthidium subparvum</i>	3	3	100.0
<i>Dianthidium ulkei</i>	24	17	70.8
<i>Dioxys aurifuscus</i>	2	2	100.0
<i>Eucera actuosa</i>	11	10	90.9
<i>Eucera cordleyi</i>	18	4	22.2
<i>Eucera edwardsii</i>	48	20	41.7
<i>Eucera frater</i>	8	8	100.0
<i>Eucera speciosa</i>	19	0	0.0
<i>Habropoda depressa</i>	4	4	100.0
<i>Habropoda miserabilis</i>	7	6	85.7
<i>Habropoda tristissima</i>	3	2	66.7
<i>Halictus Ligatus</i>	4	0	0.0
<i>Halictus confusus</i>	149	122	81.9
<i>Halictus farinosus</i>	285	247	86.7
<i>Halictus ligatus</i>	1481	1470	99.3
<i>Halictus rubicundus</i>	361	333	92.2
<i>Halictus tripartitus</i>	723	684	94.6
<i>Halictus virgatellus</i>	114	109	95.6
<i>Heriades carinata</i>	2	0	0.0
<i>Holcopasites pulchellus</i>	1	1	100.0
<i>Hoplitis albifrons</i>	5	5	100.0
<i>Hoplitis boharti</i>	2	2	100.0
<i>Hoplitis coleii</i>	1	0	0.0
<i>Hoplitis emarginata</i>	1	1	100.0
<i>Hoplitis fulgida</i>	7	7	100.0
<i>Hoplitis grinnelli</i>	8	5	62.5
<i>Hoplitis hypocrita</i>	1	1	100.0
<i>Hoplitis louisae</i>	2	2	100.0
<i>Hoplitis orthognatha</i>	7	7	100.0
<i>Hoplitis producta</i>	12	10	83.3
<i>Hoplitis uvulalis</i>	3	3	100.0
<i>Hoplitis viridimicans</i>	6	4	66.7
<i>Hylaeus basalis</i>	6	3	50.0
<i>Hylaeus mesillae</i>	1	0	0.0
<i>Hylaeus verticalis</i>	1	0	0.0
<i>Lasioglossum albipenne</i>	3	3	100.0
<i>Lasioglossum albohirtum</i>	7	7	100.0
<i>Lasioglossum allonotus</i>	1	1	100.0

Table 8: Determination accuracy for all volunteers. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Lasioglossum anhypops</i>	6	5	83.3
<i>Lasioglossum aspilurum</i>	2	2	100.0
<i>Lasioglossum athabascense</i>	2	0	0.0
<i>Lasioglossum boreale</i>	2	2	100.0
<i>Lasioglossum brunneiventre</i>	4	4	100.0
<i>Lasioglossum buccale</i>	3	3	100.0
<i>Lasioglossum colatum</i>	1	1	100.0
<i>Lasioglossum cooleyi</i>	24	1	4.2
<i>Lasioglossum cordleyi</i>	5	5	100.0
<i>Lasioglossum cressonii</i>	30	30	100.0
<i>Lasioglossum diatretum</i>	5	3	60.0
<i>Lasioglossum diversopunctatum</i>	4	4	100.0
<i>Lasioglossum egregium</i>	4	1	25.0
<i>Lasioglossum glabriventre</i>	4	4	100.0
<i>Lasioglossum helianthi</i>	1	0	0.0
<i>Lasioglossum imbrex</i>	7	0	0.0
<i>Lasioglossum incompletum</i>	79	73	92.4
<i>Lasioglossum inconditum</i>	7	5	71.4
<i>Lasioglossum kincaidii</i>	10	10	100.0
<i>Lasioglossum macroprosopum</i>	2	2	100.0
<i>Lasioglossum mellipes</i>	3	0	0.0
<i>Lasioglossum nevadense</i>	9	9	100.0
<i>Lasioglossum novascotiae</i>	1	0	0.0
<i>Lasioglossum occultum</i>	3	2	66.7
<i>Lasioglossum olympiae</i>	140	127	90.7
<i>Lasioglossum ovaliceps</i>	12	12	100.0
<i>Lasioglossum pacificum</i>	64	55	85.9
<i>Lasioglossum pavonotum</i>	56	55	98.2
<i>Lasioglossum pruinosum</i>	12	12	100.0
<i>Lasioglossum pulveris</i>	27	27	100.0
<i>Lasioglossum quebecense</i>	1	0	0.0
<i>Lasioglossum rubicundus</i>	1	0	0.0
<i>Lasioglossum ruidosense</i>	5	5	100.0
<i>Lasioglossum sequoiae</i>	6	0	0.0
<i>Lasioglossum sisymbrii</i>	105	101	96.2
<i>Lasioglossum titusi</i>	260	214	82.3
<i>Lasioglossum villosum</i>	11	8	72.7
<i>Lasioglossum zephyrus</i>	2	2	100.0
<i>Lasioglossum zonulum</i>	25	22	88.0
<i>Megachile angelarum</i>	25	22	88.0
<i>Megachile anograe</i>	6	0	0.0
<i>Megachile apicalis</i>	4	4	100.0
<i>Megachile brevis</i>	23	1	4.3
<i>Megachile fidelis</i>	6	5	83.3
<i>Megachile melanophaea</i>	2	1	50.0
<i>Megachile mellitarsis</i>	4	4	100.0
<i>Megachile montivaga</i>	3	0	0.0
<i>Megachile nevadensis</i>	8	0	0.0
<i>Megachile onobrychidis</i>	2	2	100.0
<i>Megachile perihirta</i>	61	55	90.2
<i>Megachile pugnata</i>	8	4	50.0
<i>Megachile rotundata</i>	23	22	95.7

Table 8: Determination accuracy for all volunteers. (*continued*)

Taxon	Specimens ID-ed	Correct ID	% Correct
<i>Megachile wheeleri</i>	4	4	100.0
<i>Melecta edwardsii</i>	8	8	100.0
<i>Melecta pacifica</i>	5	3	60.0
<i>Melecta separata</i>	4	4	100.0
<i>Melecta thoracica</i>	2	0	0.0
<i>Melissodes agilis</i>	1	1	100.0
<i>Melissodes bimatratus</i>	2	0	0.0
<i>Melissodes metenuus</i>	3	3	100.0
<i>Melitta americana</i>	2	0	0.0
<i>Micralictoides ruficaudus</i>	14	14	100.0
<i>Nomia melanderi</i>	1	1	100.0
<i>Osmia aglaia</i>	10	0	0.0
<i>Osmia albolateralis</i>	1	0	0.0
<i>Osmia atrocyanea</i>	10	9	90.0
<i>Osmia brevis</i>	2	0	0.0
<i>Osmia bruneri</i>	8	7	87.5
<i>Osmia californica</i>	2	0	0.0
<i>Osmia calla</i>	6	0	0.0
<i>Osmia coloradensis</i>	1	0	0.0
<i>Osmia cornifrons</i>	10	10	100.0
<i>Osmia cyanella</i>	3	0	0.0
<i>Osmia densa</i>	6	1	16.7
<i>Osmia integra</i>	1	1	100.0
<i>Osmia kincaidii</i>	3	3	100.0
<i>Osmia laeta</i>	2	0	0.0
<i>Osmia lignaria</i>	11	11	100.0
<i>Osmia montana</i>	3	3	100.0
<i>Osmia nemoris</i>	5	1	20.0
<i>Osmia sculleni</i>	3	0	0.0
<i>Perdita nevadensis</i>	1	1	100.0
<i>Protosmia rubifloris</i>	168	167	99.4
<i>Pseudoanthidium nanum</i>	2	2	100.0
<i>Stelis laticincta</i>	5	5	100.0
<i>Trachusa timberlakei</i>	5	5	100.0
<i>Triepeolus concavus</i>	4	4	100.0
<i>Triepeolus utahensis</i>	5	2	40.0
<i>Xylocopa californica</i>	1	1	100.0
<i>Xylocopa tabaniformis</i>	16	16	100.0
<i>Xylocopa virginica</i>	1	0	0.0
<i>Zacosmia maculata</i>	1	1	100.0
<i>bombus flavifrons</i>	1	0	0.0
<i>bombus melanopygus</i>	1	0	0.0
<i>bombus sitkensis</i>	1	0	0.0
<i>bombus vosnesenskii</i>	1	0	0.0
<b>TOTAL</b>	13400	12050	89.9