

Insect pollinators of Denali: A survey of bees and flower flies

By Jessica Rykken

DENALI NATIONAL PARK and Preserve’s Researcher-in-Residence program, coordinated by the Murie Science and Learning Center, was created to bring academic and other researchers to Denali (Alaska) and to facilitate sharing of knowledge and resources among scientists and Denali resources staff, interpreters, and visitors. For obvious reasons, much of the wildlife research carried out in Denali’s vast wilderness to date has focused on the “big five” (caribou, wolves, grizzly bears, moose, and Dall’s sheep). However, in 2012, my proposal to survey “the other fur-bearers” of Denali, namely insect pollinators, was met with great enthusiasm by park staff, and I was awarded the grant.

Pollinators are critical to maintaining healthy plant communities and functioning ecosystems, and in the subarctic wilderness of Denali they may be especially vulnerable to effects from climate change. Changes in pollinator diversity, abundance, phenology (e.g., timing of pollinator emergence and foraging activity), and range over time may also serve as effective indicators of change for larger ecosystem processes. Establishing baseline data on these insects has potential long-term benefits for monitoring, in addition to giving the park new information about lesser-known realms of biodiversity.

The survey focused on bees (Hymenoptera: Anthophila) and flower flies (Diptera: Syrphidae). I spent five weeks collecting these pollinators in various habitats along the 145 km (90 mi) park road, and was joined by park staff and volunteers on several days. Collecting techniques included active netting and two types of traps: “bee



A male *Bombus sylvicola* (forest bumble bee) feeds on Eskimo potato (*Hedysarum alpinum*).

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The author with net: Looking for pollinators in an Alaska summer often requires a wool hat and rain gear.

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Vane trap: Pollinators are attracted to the blue color of the trap.

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Bombus balteatus, the golden-belted bumble bee, is a species of high elevations and latitudes.

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bowls” (small painted cups filled with soapy water) laid out in transects and individual “vane traps,” which lure pollinators into a blue vane attached to a collecting jar. Focal habitats included alpine and shrub tundra, rocky ridges and summits, river gravel bars, edges of roads and trails, and lower-elevation meadows.

In all, the survey yielded 13 species of bumble bees (502 specimens), 7 species of soli-

tary and parasitic bees (50 specimens), and 42 species of flower flies (328 specimens). Bees were identified by me, with assistance from Jamie Strange and Terry Griswold at the USDA Agricultural Research Service Bee Biology and Systematics Lab in Logan, Utah; all flower flies were identified by F. C. Thompson at the Smithsonian Institution. Among the pollinators were one

specimen of *Bombus occidentalis*, a bumble bee that has all but disappeared farther south in its range but is apparently thriving in many locations in interior Alaska, and a single specimen of a flower fly new to science in the genus *Cheilosia*. Several of the flower flies represent new published records for the state of Alaska, and almost all species, with the exception of at least seven bumble bees, are new records for the park.

Denali’s Researcher-in-Residence program also promotes outreach, and at the park I engaged in various activities to educate park staff and visitors about Denali’s pollinators. This included leading a “Denali-ology” seminar; delivering presentations to the public, interpretive staff, and natural resource management staff; and giving weekly microscope sessions at the Murie Science and Learning Center to show visitors the diversity of pollinators up close. After leaving Denali I worked with park staff to create a pollinator fact sheet for the park, and I’m currently collaborating on a “Virtual Tour of Denali Pollinators” for the visitor center and the Denali Web site.

About the author

Jessica Rykken (jrykken@oeb.harvard.edu) is an associate at the Museum of Comparative Zoology, Harvard University, in Cambridge, Massachusetts. She has been involved in biodiversity discovery work at Acadia National Park, Boston Harbor Islands NRA, George Washington Birthplace National Monument, and Yellowstone National Park.