

Subgenus *Bombus* Latreille, 1802 (Apidae: Apinae: Bombini)

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Note: During the summer of 2005, several scientists are undertaking surveys and research that will provide an accurate assessment of the status, threats, and conservation needs of the subgenus *Bombus*. Detailed profiles will be prepared for these species and published in fall 2005.

SUMMARY

The bumble bee subgenus *Bombus* is represented by five species in North America. Of these, one, *B. franklini*, may be extinct, and two others, the western *B. occidentalis* and the eastern *B. affinis*, appear to be in steep decline. For all of these species, habitat loss and degradation and extensive pesticide use are threats faced daily. However, circumstantial evidence indicates that the principal cause for these population declines is the introduction of exotic disease organisms and pathogens via trafficking in commercial bumble bee queens and colonies for greenhouse pollination of tomatoes.

CONSERVATION STATUS

Xerces Red List Status: Vulnerable (Data Deficient)

Other Rankings:

Canada – Species at Risk Act:	N/A
Canada – provincial status:	N/A
Mexico:	N/A
USA – Endangered Species Act:	N/A
USA – state status:	N/A
NatureServe:	N/A
IUCN Red List:	N/A

SUBGENUS PROFILE

DESCRIPTION

The subgenus *Bombus* is a Holarctic subgenus, which includes eleven species. Five of these are found in North America:

Bombus affinis Cresson, 1863
Bombus lucorum (Linnaeus), 1761
Bombus franklini (Frisson), 1921 (Franklin's Bumble Bee)
Bombus occidentalis (Greene), 1858
Bombus terricola Kirby, 1837

TAXONOMIC STATUS

Of the five North American species, four of them are generally accepted as full species. However, some authors consider the fifth, *B. occidentalis*, to be a subspecies of *B. terricola*, but this is not generally accepted. In this profile we keep it as a separate species.

LIFE HISTORY

All of these bumble bees are typical primitively eusocial. Females are generalist foragers for pollen. Bumble bees in this subgenus usually nest in abandoned rodent burrows, although for some species such as *B. franklini* (see Red List profile for more details of this species) nest site preferences are not known. The flight season varies between regions and species, but they are generally active from mid-spring to early fall.

DISTRIBUTION

Bombus affinis is restricted to eastern North America, from Quebec and Ontario in the north to Georgia in the south and west to the Dakotas.

Bombus lucorum is a Holarctic species. In North America, it is limited to western Canada (Alberta, British Columbia, NW Territories, and Yukon) and Alaska.

Bombus franklini has the smallest range of any bumble bee. It is only found west of the Sierra-Cascade Range in northern California and southern Oregon.

Bombus occidentalis is found along the West Coast of North America from Alaska to central California and east to northern Nevada, Arizona, and New Mexico.

Bombus terricola is found in the east of North America, along the Atlantic coast from Florida to Nova Scotia and west in the northern part of its range as far as Montana and British Columbia.

THREATS

The major threats to these bumble bees are exotic diseases introduced via trafficking in commercial bumble bee queens and nests for greenhouse pollination of tomatoes (Thorp 2003, Thorp et al. 2003), habitat loss due to urban development and agricultural conversion, and the extensive use of pesticides.

At least two of the disease organisms mentioned under Research Needs are known to occur in commercially produced bumble bee colonies and have been introduced from Europe into Japan (Goka et al. 2000; Goka et al. 2001; Niwa et al. 2004). It is likely that the *Nosema* outbreak in commercial bumble bee production facilities in the North

America reported in 1998 (Flanders et al. 2003) is also responsible for the severe declines seen in *B. franklini* and *B. occidentalis* since that time from central California to southern British Columbia (R.W. Thorp unpublished data). Declines of the other two species of *Bombus sensu stricto* in eastern North America, *B. affinis* and *B. terricola*, (J. Ascher personal communication) probably have the same root cause.

CONSERVATION STATUS

The current status of most of these bumble bees is not known in detail. What data exist indicate that they have gone into steep decline over a short period. *B. occidentalis*, for example, was once the most common bumble bee found in the western United States and now appears to have disappeared from some parts of its range and has experienced a steep decline from central California to southern British Columbia since 1998. A similar situation seems to be facing *B. affinis*.

For *B. franklini*, intensive and extensive surveys have been undertaken by Robbin Thorp (University of California at Davis) between 1998 and 2004. During this time there has been a precipitous decline in numbers and localities of occurrence. No *B. franklini* were observed during surveys in 2004 and it is possible that it has become extinct. (See Red List profile for this bee for detailed information.)

Bombus franklini is the only bumble bee to have received any conservation attention. However, despite evidence of declines, No *B. franklini* has no legal protection under the U.S. Endangered Species Act and neither Oregon nor California allows listing of insects under their respective state endangered species statutes. It is currently considered to be a “Species of Concern” or a “Special Status Species” by U.S. Fish and Wildlife Service, Bureau of Land Management, Oregon Department of Fish and Wildlife, and California Department of Fish and Game, categories that give it no effective protection.

CONSERVATION NEEDS

Bombus franklini habitat should be protected. Habitat should include plentiful pollen and nectar resources, abandoned rodent burrows in which to nest, and probably proximity to water sources (lakes, rivers, streams, seeps) for prolongation of flowering season of plant food sources.

All efforts should be made to prevent the spread of disease from commercially reared and managed bumble bee colonies to native populations.

RESEARCH NEEDS

To monitor, sample, and make population estimates of extant populations of all North American species in the subgenus *Bombus*. To understand the pathology and control of *Nosema bombi* [Microsporidia] and other potential disease organisms (such as *Locustacrus buchneri* [Acarina] and *Crithidia bombi* [Protozoa]). To understand the virulence and cross-infectivity of strains of these disease organisms, especially *Nosema bombi*, between commercially reared bumble bees and bumble bee species in the wild to better assess the ecological risks of trafficking in these managed crop pollinators.

RESOURCES

CONTACTS

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WEBSITES

Natural History Museum (London), Department of Entomology; *Bombus* database:
Bombus in the strict sense.

<http://www.nhm.ac.uk/research-curation/projects/bombus/bo.html>

(Accessed 5/25/05)