The Conservation Status of Bumble Bees of Canada, the USA, and Mexico

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Photo: Clay Bolt
Importance of Bumble Bees

There are 57 bumble bee species in Canada, US and Mexico.
Importance of Bumble Bees

Important pollinator of many crops.

*Bombus sandersoni*, Sanderson’s bumble bee
Importance of Bumble Bees

Keystone pollinator in ecosystems.
Bumble Bee Extinction Risk Assessment

Network of 75+ bumble bee experts & specialists worldwide

Goal: global bumble bee extinction risk assessment using consistent criteria
IUCN Red List Criteria for Evaluating Extinction Risk

- Used a database of 250,000+ specimen records (created from multiple data providers and compiled by Leif Richardson for Bumble Bees of North America)

- Evaluate changes between recent (2002-2012) and historic (pre-2002):
  - Range (Extent of Occurrence)
  - Relative abundance
  - Persistence (50 km x 50 km grid cell occupancy)

Sources: Hatfield et al. 2015
Bumble Bee Extinction Risk Assessment

IUCN Red List Criteria for Evaluating Extinction Risk

- Analyses informed application of Red List Categories; BBSG members provided review
- This method was then adapted and applied to South American and Mesoamerican bumble bees.

Sources: Hatfield et al. 2015
28% of bumble bees in Canada, the United States, and Mexico are in an IUCN Threatened Category.

Sources: Hatfield et al. 2015
5 out of 12 bumble bees in Mexico fall in a Threatened Category

Sources: Hatfield et al. 2015
**Bombus terricola**
Yellow banded bumble bee

Range loss (adjusted by collection effort): 36%

Relative Abundance (to historic value): 20%

Persistence (relative to historic value): 67%

Average Decline: 50%

IUCN Red List: Vulnerable

Species of concern COSEWIC
*Bombus affinis*

Rusty patched bumble bee

Range loss (adjusted by collection effort): **45%**

Relative Abundance (to historic value): **7%**

Persistence (relative to historic value): **30%**

Average Decline: **69%**

IUCN Red List: **Critically Endangered**

Protected under (SARA)
**Bombus occidentalis**  
Western bumble bee

Range loss (adjusted by collection effort): **22%**

Relative Abundance (to historic value): **29%**

Persistence (relative to historic value): **73%**

**Average Decline:** 40%

IUCN Red List: **Vulnerable**
**Bombus haueri**

Range loss (adjusted by collection effort): **90%**
Relative Abundance (to historic value): **28%**
Persistence relative to historic values: **40%**

**Average Decline: 74%**  **IUCN Red List: Endangered**
Bombus vosnesenskii
Vosnesensky bumble bee

Range loss (adjusted by collection effort): 11%

Relative Abundance (to historic value): 124%

Persistence (relative to historic value): 76%

Average Decline: 0%

IUCN Red List: Least Concern
Threats to Bumble Bees: Habitat Loss
Pesticides have been implicated in the decline of pollinator species.

- Mosquito control and agricultural uses are a threat
More pesticides are used in urban areas than in many agricultural areas.
Threats to Bumble Bees: Systemic Pesticides

**Systemic Insecticides:**
- Increasingly used on crops, ornamental plants, and lawns
- Systemic mode of action
- Residues in pollen and nectar
- Can be persistent long periods in plants and soil
Most used class of pesticides in the world.

• One of the most widely used class of insecticides in the U.S.

Photo: Matthew Shepherd
Threats to Bumble Bees: Systemic Pesticides

Estimated Agricultural Use for Imidacloprid, 2013 (Preliminary)

EPest-Low

Estimated use on agricultural land, in pounds per square mile

- < 0.01
- 0.01 - 0.02
- 0.03 - 0.04
- > 0.04
- No estimated use

Disease

- Moving bees means potentially moving diseases

Source: Graystock et al. 2013; Reade et al 2014; Cameron et al. 2016

Photos: cincooldesigns, Wikimedia Commons; Eric Lee-Mäder
Threats to Bumble Bees: Disease

• Pathogens include:
  • *Nosema bombi*
  • *Crithidia bombi*
  • Deformed wing virus
  • Many others

Source: Graystock et al. 2013; Reade et al 2014; Cameron et al. 2016
Threats to Bumble Bees: Disease

Disease is implicated in the decline of at least three species in North America.

- *Bombus terricola*
- *Bombus affinis*
- *Bombus franklini*

Source: Cameron et al. 2016
Significant concerns exist regarding the interaction between honey bees and native bees:
- Competition for floral resources
- Spread of disease

Source: Singh et al. 2010; Furst et al. 2014; Graystock et al. 2014
Scientists are just beginning to understand the potential negative impacts of climate change on pollinators.
Bumble Bee Conservation: Disease

More effective disease detection and management strategies are urgently needed to reduce the pathogen spillover threat from commercially produced bumblebees. – (Graystock et al. 2013)

Photos: Pete Schroeder, Rich Hatfield, José Montalva

Photo: q_ilex on flickr

Photo: ASANUMA Takao
Only local bumblebee species and subspecies should be grown for commercial development and employed within their native ranges. All commercial bumblebees should be thoroughly screened for pathogens and parasites by both producers and independent regulators.

- Joint Policy Statement IUCN BBSG
Bumble Bee Conservation: Pesticides

Cities, counties, states and provinces can pass ordinances that will protect bumble bees and other native bees from pesticides.

Federal regulatory agencies should ensure the unique risks native bees face are considered in pesticide registration and on pesticide labeling.
Additional land management agencies can follow the lead of the USFWS National Wildlife Refuge System in phasing out neonicotinoids on properties they manage.
Bumble bees have been included as SGCN in State Wildlife Action Plans. Provincial endangered species lists, and as Sensitive Species on National Forests.
US Farm Bill provides cost share funding for habitat improvements thereby lowering the cost for restoration and enhancements.
In partnership with NRCS and private landowners, working through farm Bill Programs Xerces has restored and enhanced more than 245,000 acres of flower rich habitat in agricultural landscapes.
Guidelines for conserving and managing bumble bee habitat.
Xerces is finalizing an agreement with USFS to develop “best management practices” for native pollinators on rangelands in the western US.
Xerces is working with ICF International under a contract with the Federal Highway Administration to develop roadside Best Management Practices.
Bumble Bee Conservation: Citizen Science

BUMBLE BEE WATCH
A collaborative effort to track and conserve North America’s bumble bees

Join us today at www.BumbleBeeWatch.org
Bumble Bee Citizen Science data is used to:

- Identify the current distribution of at-risk species
- Reach out to land managers who host these species with conservation guidance
- Inform future recommendations to land managers regarding how to conserve, enhance, and restore high quality bumble bee habitat

www.BumbleBeeWatch.org 9,500+ photos submitted since January 2014 launch
Questions?