



Bumblebee Specialist Group Report 2013

Edited by Paul Williams (Chair, UK) and Sarina Jepsen (Red List Authority Coordinator, USA)

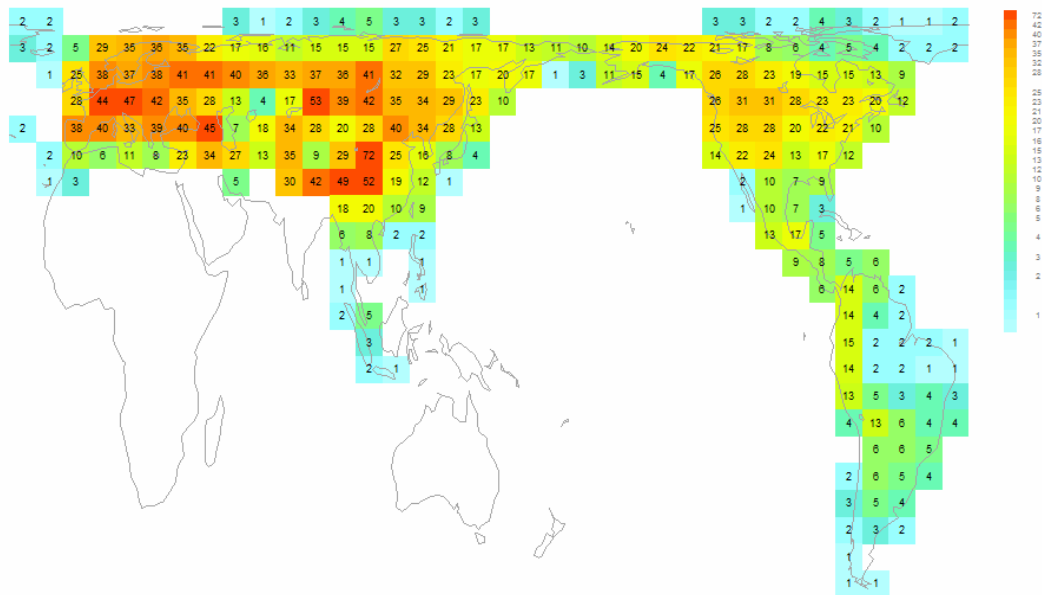
BBSG IN 2013

The BBSG exists to foster the conservation of bumblebees (c. 250 species) and their habitats around the world. In this second report of the BBSG's activities, we see the BBSG already producing results in terms of regional Red List assessments of bumblebee species. For another year it is very encouraging to see such strong progress by our 75 volunteer members in many regions.

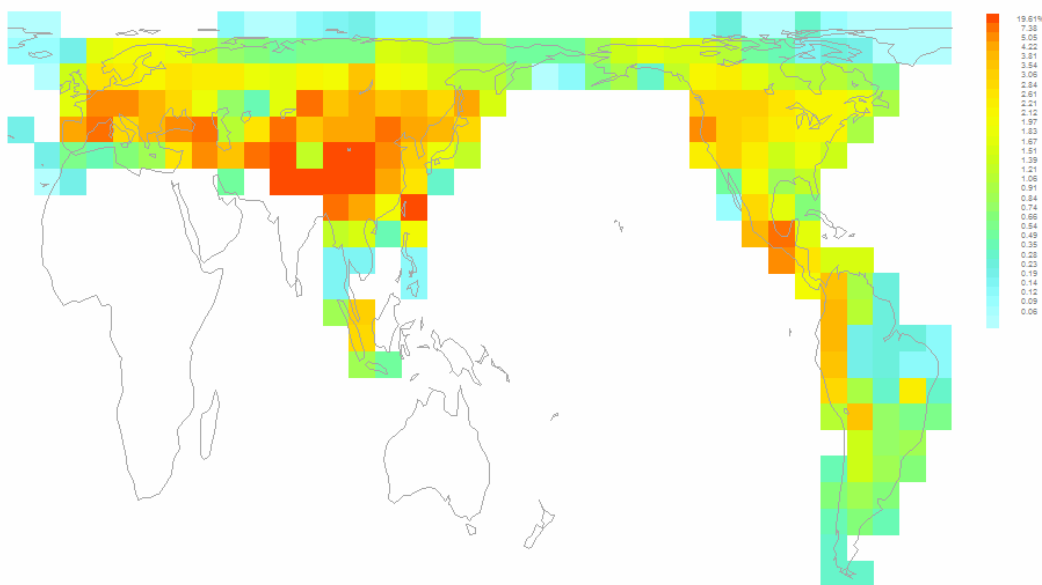
iucn.org/bumblebees

SIZE OF THE CHALLENGE

We are probably all familiar with the idea that bumblebees tend to be most plentiful, in terms of both numbers of species and of numbers of individuals, in cool habitats in temperate and mountainous regions. The maps below show variation in species richness and in a measure of species endemism (as relative range-size rarity, reviewed in Williams, 2000) among equal-area grid cells for all bumblebee species world-wide.

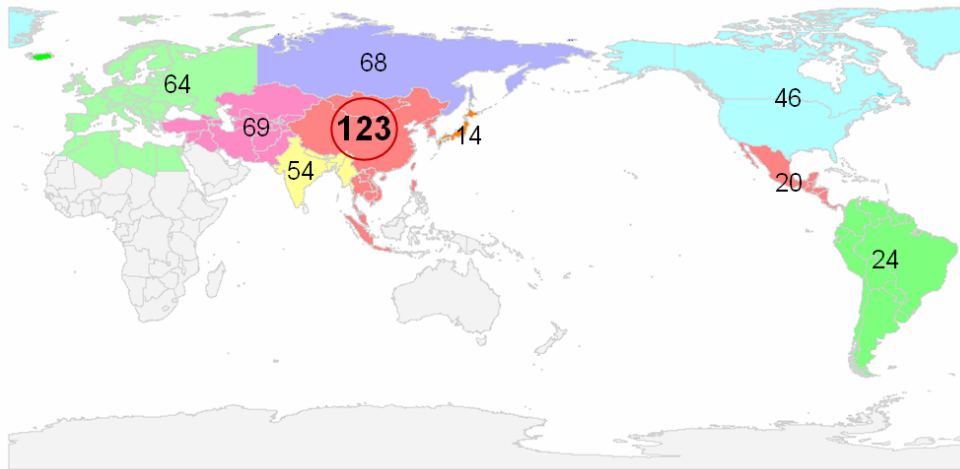


Species richness of bumblebees among equal-area grid cells.

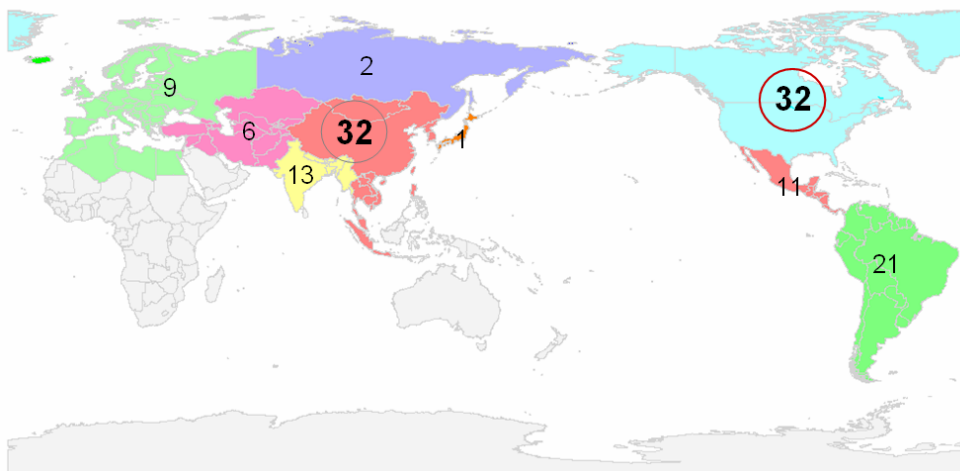


Species endemism (range-size rarity) of bumblebees among equal-area grid cells.

But how does this relate to BBSG regions? The next two maps show estimates of the bumblebee species richness and species endemism for the nine BBSG regions:



Species richness of bumblebees among BBSG regions.



Species endemism of bumblebees among BBSG regions.

The species richness map obviously shows the size of the problem of how many species need assessments within each region. But the species endemism map shows for how many species each region is uniquely responsible. The North American region is perhaps fortunate in having relatively few species in total, but contributing many unique species. In contrast, the East Asian Region has very many species in total for the same number of unique species.

The ultimate aim of the BBSG as an IUCN-SSC member is to produce Red List assessments of the Red List status for each bumblebee species on a world-wide basis. So we are keen to encourage discussions among regional groups to share ideas and experience on the assessment methods. We hope to be able to move towards a common view of best practice, so that it is easier to arrive at comparable assessments around the world. We will need to combine these among regions in some cases to produce global assessments of the most widespread species.

REF: Williams PH. 2000. Some properties of rarity scores used in site quality assessment. *British Journal of Entomology and Natural History* 13: 73-86. nhm.ac.uk/research-curation/research/projects/bombus/Williams00_rarity.pdf

Regional reports

EUROPE

Pierre Rasmont / Stuart Roberts / Denis Michez

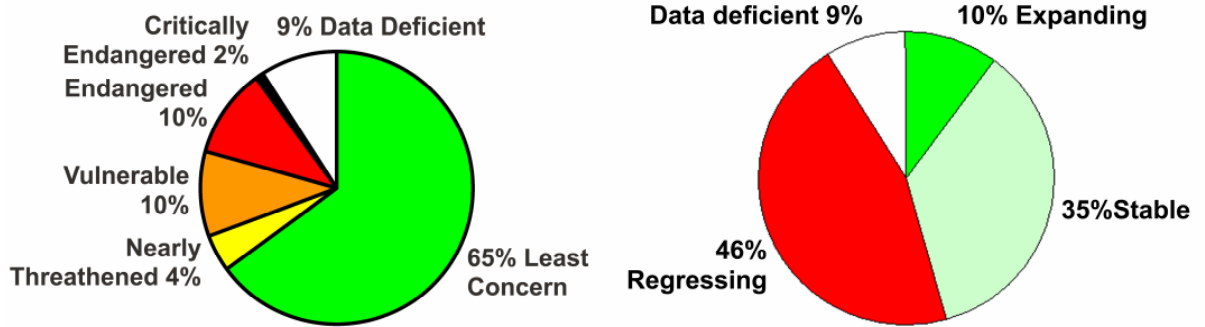
Thanks to a very wide cooperation that allowed data to be gathered from a large number of contributors, the STEP project team was able to compile 929,361 data for West-Palaeartic bumblebees. All of the maps are shown on the website *Atlas Hymenoptera* (Rasmont & Iserbyt 2010-2012: <http://www.zoologie.umh.ac.be/hymenoptera/page.asp?id=169>). All maps show data for 3 recording periods: before 1950, from 1950 to 1989, and since 1990. This allows the present status of each species to be visualised easily. From this very large data set, the BBSG - European Region extracted the information to complete assessments for all 68 bumblebee species found in the region covered (891,619 data). All maps are now displayed on the IUCN website. It should be noted that the information displayed in the two atlases is different, complementing one another and providing a base for future refinement of the assessment. The group held a meeting of specialists (Bjorn Cederberg, Denis Michez, Ana Nieto, Vladimir Radchenko, Pierre Rasmont, Stuart Roberts) in Brussels in August 2012 to examine carefully all of the available information and to assess the status of each bumblebee species. One species is listed as Critically Endangered (below), 7 species are Endangered, 7 species are Vulnerable, 3 species are Near Threatened, 44 species are Least Concern, and 6 species remain Data Deficient. It is noticeable that inside the category Least Concern, 7 species are clearly expanding, 24 species seem more or less stable, while 13 species are conspicuously regressing in one or other parts of the region.

Compared with most other wild bees, the bumblebee data are especially numerous in both time and space. This abundance of data proved invaluable for assessing the conservation status of these insects. However, the group also completed the historical and statistical data with personal visits to locations where some of the rarest species were found most recently. These field data showed that some of the most regressing species could not now be found in most of their sites with recent records. For *Bombus cullumanus* (below), *B. armeniacus*, *B. fragrans*, *B. mocsaryi* and *B. zonatus* we have not found any recent specimens in most of the sites where we observed abundant populations 10-20 years ago. Some other of the most endangered species live in areas that are so restricted that they are at risk of extinction, particularly for *B. brodmannicus*, *B. inexpectatus* and *B. reinigiellus*.

In summary, of the 68 bumblebees present in the area assessed by the group, 7 species are expanding (10%), 24 are stable (35%), 31 are regressing (46%) and 6 (9%) are Data Deficient (below). The situation for European bumblebees is serious.



B. cullumanus serrisquama, a species with Critically Endangered status in Europe. The West-European nominal subspecies is now Extinct. Nevertheless, the yellow-banded ssp. *serrisquama* persists in Caucasian region, along the Volga and in few locations in Spain. (Photo Pierre Rasmont.)

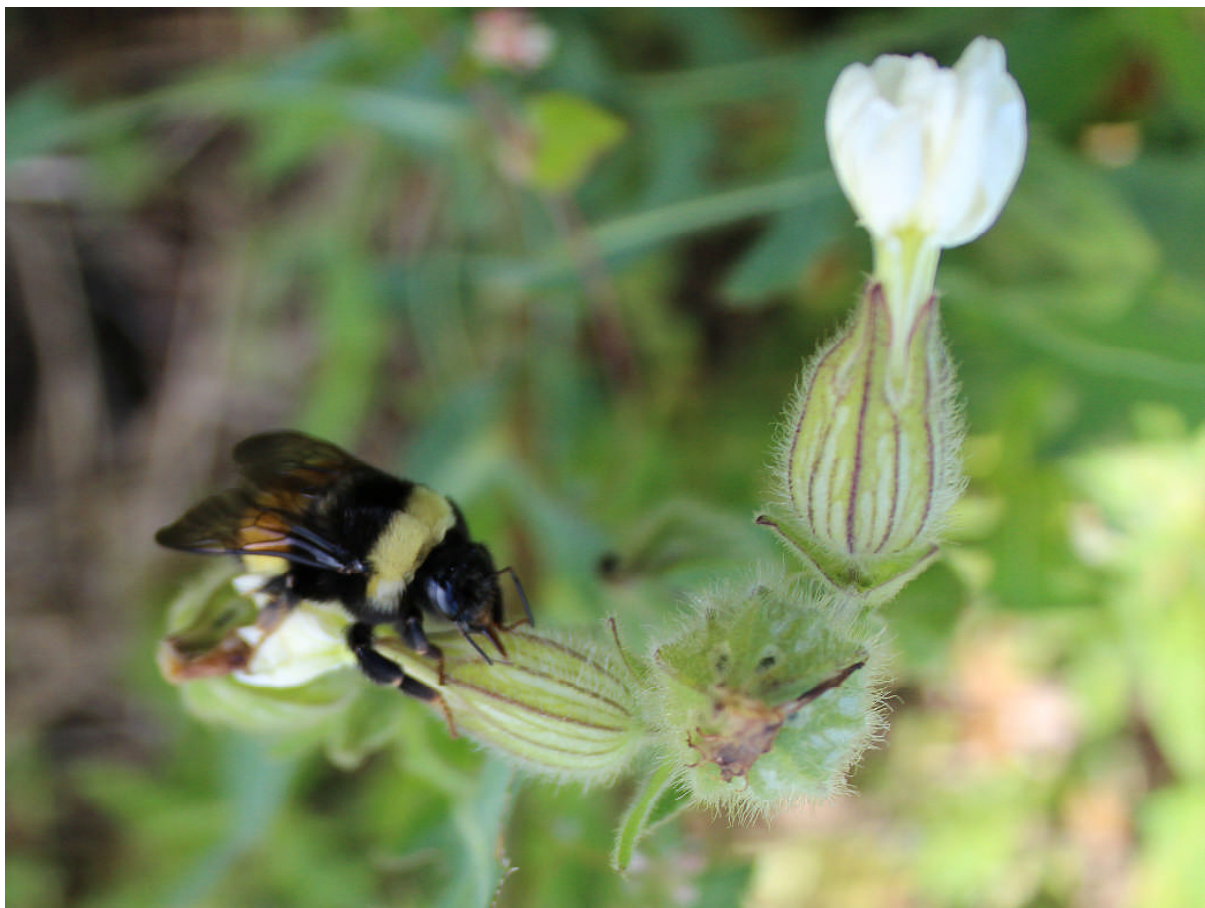


Left: Red List status of European bumblebees (68 bumblebee species in the region). Right: Summary of the regression status of European bumblebees. "Regressing" includes the IUCN categories Critically Endangered, Endangered, Vulnerable, Nearly Threatened, and Least Concern, where the species show conspicuous regression in some part of their distribution. The species with "stable" and with "expanding" status also include species in the IUCN category Least Concern.

NORTH AMERICA

Robbin Thorp / Sheila Colla / Sarina Jepsen

In North America, we are using a database of nearly 300,000 digitized, georeferenced museum specimens from multiple contributors spanning the period 1805-2012 to evaluate the conservation status of the 46 North American *Bombus* species north of Mexico. To do this, we are assessing changes in relative abundance, extent of occurrence, and persistence between a recent time period (2002-2012) and an earlier time period (1805-2001), then qualitatively evaluating the survey effort that has occurred in the recent time period, in order to identify potentially misleading changes in extent of occurrence. Our preliminary findings suggest that nearly one-third of the North American bumblebee fauna is in a moderate to severe level of decline (Vulnerable, Endangered, or Critically Endangered). We have assigned species to threat/ rarity categories using IUCN criteria and will soon send these preliminary results to North American regional members for review. We are also in the process of compiling biological information and knowledge about known and suspected threats to each species to help with future conservation management of declining species. We anticipate submitting a manuscript describing this work to a peer-reviewed journal in early 2014.



B. terricola, a species with a draft status of Vulnerable in North America, robbing *Silene vulgaris* flowers near Barrie, Ontario, Canada. (Photo Sheila Colla.)

MESOAMERICA

Remy Vandame

This was another year of intensive field work for the Mesoamerica regional group, with people sampling in Guatemala and all of the north of Mexico. Nearly 8000 bumblebees have been collected from more than 400 sampling sites in the last two years. Their bodies (pin-mounted), legs (DNA), and guts (pathogens) are providing much new information. At first sight, some new species are apparent, and a heterogeneous distribution of pathogens seems to reflect agricultural practices. There is certainly work for many years to come in these samples. Fortunately, collaborations in Mexico, the US, and Switzerland, will all help in making progress rapid. All of the work is made possible by an important grant from Conabio (National Commission on Biodiversity), who are concerned about the likely impacts of species introduced for pollination, species which could become invasive. In 2013, the group has worked hard with the help of Nieves Garcia to draft an initial Red List assessment for the main species in the region.

Looking forward, the group will organize the IX Mesoamerican Congress on Native Bees, to be held in San Cristóbal de Las Casas in 2015. With plenty of new data, this will certainly be an important bumblebee meeting.



B. ephippiatus (left) and *B. huntii* at Guadalupe y Calvo, Chihuahua, Mexico, during field work. (Photo Jorge Mérida.)

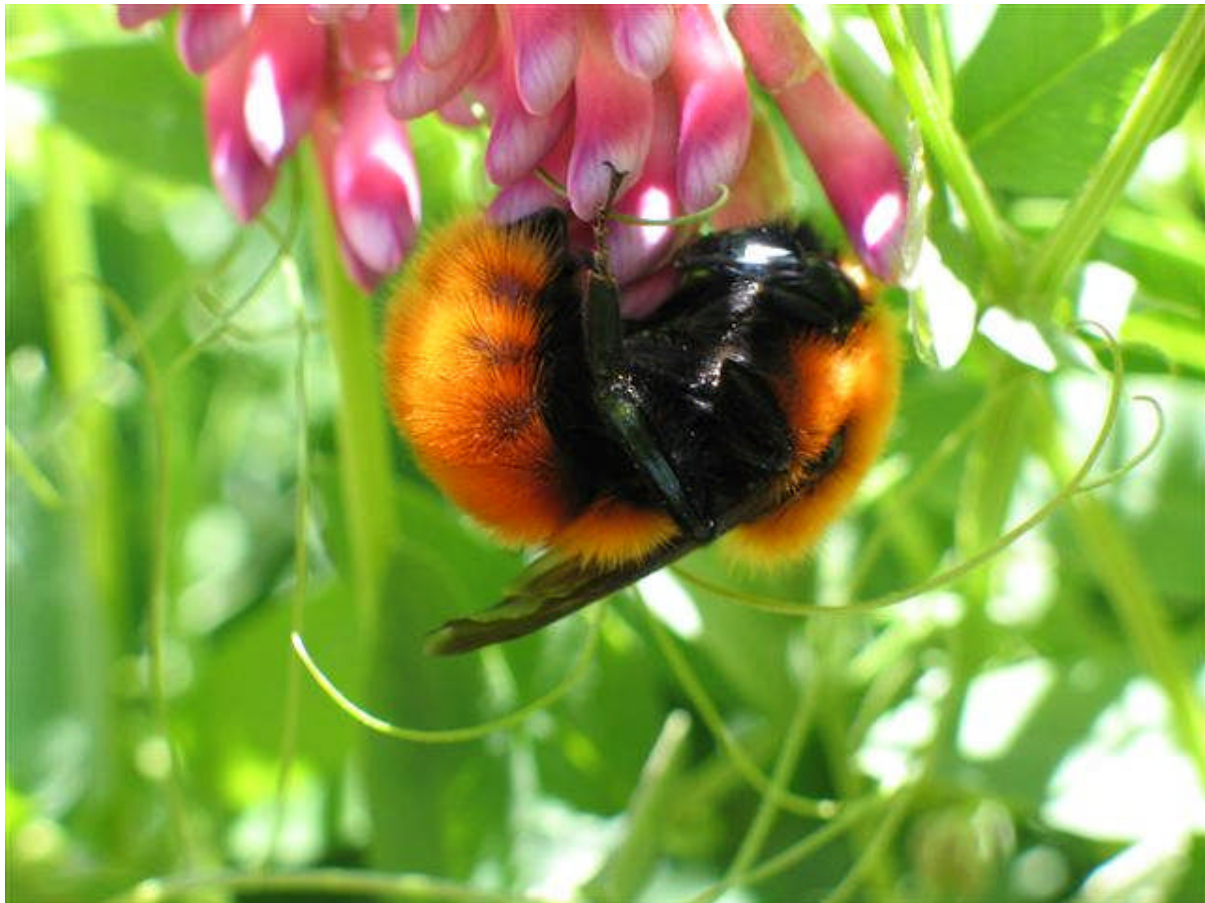


Field work by Jorge Mérida, Erika Núñez, and Philippe Sagot at Guadalupe y Calvo, Chihuahua, Mexico (Photo Jorge Mérida.)

SOUTH AMERICA

Carolina Morales

2013 was a year full of activities and achievements for the South American Group. In January 2013 we set the goal of completing the Red List assessment of at least one third of the 24 bumblebee species included in our region during this year. The assessments of all the 24 species are in progress, some of them relatively advanced and now almost ready. Thanks to the effort of the whole team of South American specialists, in particular of those volunteer members who committed to lead individual species assessments (Claus Rasmussen, Aline Martins and Carolina Morales, with the assistance of Yamila Sasal), and the invaluable technical support of Nieves Garcia who coordinated this process, the majority of the work is completed. Therefore, we should be able to finalize the assessments soon. For these final steps, Neil Cox recently joined the team and will be working on finalizing the Red List assessments for the South American bumblebees over the next few months. Finally, this year we welcome a new bumble bee specialist, Dr Victor Gonzales-Betancourt, from Colombia.



B. dahlbomii, a species with a draft status of Endangered in South America, visiting *Vicia nigricans* flowers at Nahuel Huapi National Park, Rio Negro, Argentina. (Photo Carolina Morales.)

NORTH ASIA

Alexandr Byvaltsev

In 2013, we worked in the following areas:

1. Mapping bumblebee species ranges in Russia. We hope to show the first version of our web-page with these data at the end of 2013.
2. All of us collected bumblebees in the regions where we live. Research to assess the relative abundance of bumblebees in the steppes of Khakassia was carried out for the first time.
3. The second edition of the Red Book of Tomsk Oblast was published. Four species of bumblebees were included – *B. confusus*, *B. modestus*, *B. muscorum* and *B. patagiatus*.
4. Estimations of populations of 65 bumblebee species in eight regions were conducted:
 - European North Russia (excluding Vologda Oblast; Yulia Kolosova);
 - Vologda oblast (Natalya Kolesova);
 - North-West Caucasus (Krasnodar krai, Adygea, Karachay-Cherkessia: Igor Popov);
 - Khanty-Mansiysk Autonomous Okrug – Ugra (Aigul Demidova);
 - Tomsk Oblast (Olga Konusova);
 - forest-steppe and steppe life zones of the West-Siberian Plain: Russia – Kurgan, Omsk and Novosibirsk Oblast, and Altay Territory; Kazakhstan – North Kazakhstan Oblast and the northern part of Kostanai Oblast (Alexandr Byvaltsev);
 - Kuznetsk-Salair Mountain Area (Sergei Luzjanin);
 - steppe zone of Khakassia (Alexandr Byvaltsev).

Three groups of threatened species are identified:

1. *B. amurensis*, *B. fragrans*, *B. zonatus*, *B. wurflenii* – Vulnerable or Extinct;
2. *B. muscorum*, *B. semenoviellus* – Vulnerable;
3. *B. modestus* – Near Threatened.

Even though we have no quantitative estimates for the regional habitat of *B. unicus*, *B. anachoreta* and *B. czerskii*, nonetheless they should be assessed as Vulnerable because of the small area of their habitat (mainly in Primorye) and because of their weak representation in collections in comparison with other species. Assessment of the threats is reflected in the formula - VU E.

WEST ASIA

Murat Aytekin / Alireza Monfared

Surveys of new regions of Iran were carried out in 2013 with the help of a team of MSc students. Most previous collections of bumblebees in Iran have concentrated on the Elborz mountains of the north, although bumblebees are also known to inhabit mountains in the northwest (Sabalan), west (Zagros), and some central areas.

In the northwest of Fars Province, bumblebees were collected from localities in the Saran plains and Sepidan. Three species were recorded: *B. (Sibiricobombus) niveatus*, *B. (Thoracobombus) armeniacus*, and *B. (Thoracobombus) zonatus*, among which the most abundant was *B. armeniacus*. Fars province is a mostly arid region in the south of Iran. In the North West of the province, in the regions of Sepidan, are the mountains of the Zagros range. The higher elevations are covered with snow in winter, providing cool habitats for bumblebees. The study will continue to look for nests in the coming year.



Collecting site at Sepidan, Fars, Iran. (Photo Alireza Monfared.)

In Chaharmahal and Bakhtyari Province, bumblebees were collected from localities including Baba Haidar, Kuhrang, Abshar, Chelgerd, and Cheshmehshaykhalikhan. These bumblebees were identified as: *B. niveatus*, *B. armeniacus*, *B. zonatus*, *B. (Megabombus) argillaceus*, *B. (Megabombus) portchinsky*, *B. (Thoracobombus) ruderarius*, and *B. zonatus*.



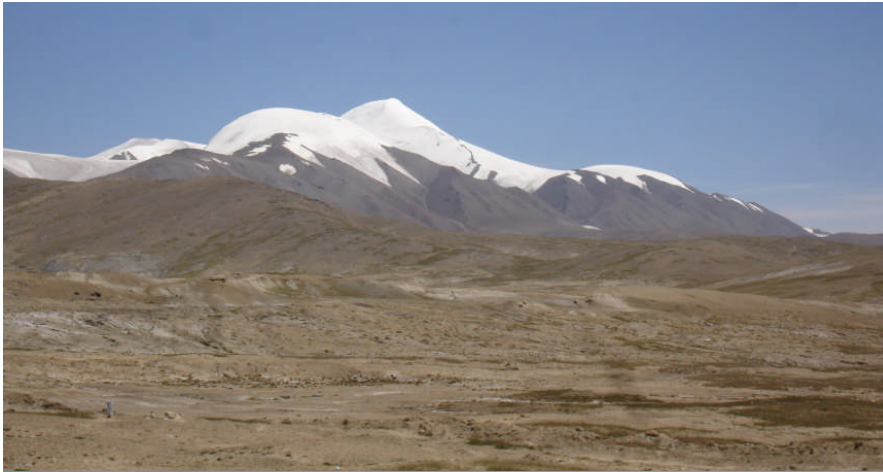
Alireza Monfared collecting bumblebees near Baba Haidar city, Chaharmahal and Bakhtiari, Iran.

In Zanjan province, a survey collected seven bumblebee species from one new locality. The species included: *B. argillaceus*, *B. zonatus* (both yellow- and white-banded patterns), *B. niveatus* (both yellow- and white-banded patterns), *B. armeniacus*, *B. maxillosus*, *B. persicus*, and *B. fragrans*.

EAST ASIA

An Jiandong / Paul Williams

Work has continued to focus on the basics of finding out what is present in this, the largest and least well known bumblebee fauna world-wide. Field surveys are extending our reference collections to cover even more remote and rarely visited areas, such as the Kunlun mountain range at the north of the Tibetan plateau (below). Based on these collections, several subgenera of bumblebees are being revised from DNA and morphology to clarify the species present, with a particular focus at present on the subgenera *Mendacibombus* and *Megabombus*, which are especially well represented in China. The results are now feeding into reviews of the broader fauna, which this year include the first guide to the bumblebees of North China (78 species, which is larger than the fauna of any other region), to include keys, photos, and distribution maps. All of this work is being organised with the aim of moving towards Red List assessments for all species.



Collecting in the Kunlun Shan, at the northern edge of the Tibetan plateau. The mountain above is Yushu Feng reaching 6170 m. The neighbouring site below at 4614 m had 7 species recorded, typical of the Ladakh-Kunlun Shan fauna of the arid interior of the Tibetan plateau. (Photos Paul Williams/Lucy Bailey.)

OTHER ACTIVITIES

In Russia, the second edition of the Red Book of Tomsk Oblast was published, which included four bumblebee species: *B. confusus*, *B. modestus*, *B. muscorum* and *B. patagiatus*.

In Canada, *B. affinis* had previously been listed as Endangered (largely based on IUCN criteria) federally and provincially. Three other species are now under assessment: *B. bohemicus*, *B. occidentalis*, and *B. terricola*.

In the US, a petition for the protection of *B. affinis* under the ESA has been submitted by the Xerces Society.

Last but by no means least, our newsletter (*Bumblebee Conservator*) was introduced in 2013, many thanks to Ed Spevak (Saint Louis Zoo), and our website (iucn.org/bumblebees) has grown.

BBSG IN 2014

We are now well in progress with species assessments in at least some of the regions. Now that these have begun, we need to share experience in how best to apply IUCN Red List criteria to bumblebee data. The BBSG group mailing list (iucn-bumblebee@googlegroups.com) is just one route that can be used for this. We are also trying to raise money to fund an international meeting to help with the exchange of ideas. As ever, let us know what you need and we will try to find a way to help.



London 13 December 2013