THE XERCES SOCIETY
FOR INVERTEBRATE CONSERVATION

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Mr. Osama El-Lissy
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Animal and Plant Health Inspection Service
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Washington, DC 20250

August 26, 2014

Re: Follow-up to June 23, 2014 bumble bee meeting with scientific literature about commercial bumble bees and bee pathogens

Dear Mr. Osama El-Lissy,

Thank you for taking the time to meet with us on June 23, 2014 to discuss the plight of native United States bumble bees and the risks to those species posed by commercial bumble bees. As we discussed at that meeting, multiple species of wild bumble bees have declined in large areas of their historic ranges and are at risk of extinction. Pathogens from managed pollinators are thought to have played a significant role in that decline. Thus, as we explained in our January 2010 petition, regulation of commercial bumble bees is a highly time-sensitive issue.

We received your July 11, 2014 letter and support your evidence-based approach to developing regulations. For that reason, and as promised at the June meeting, we are writing to provide you with a short synthesis and reference list of some key and recent studies regarding commercial bumble bees and bumble bee pathogens. It is our hope that this science will inform and help activate your efforts to protect native bumble bees.

I. Recent science continues to support the need to regulate the movement of commercial bumble bees.

In an April 16, 2014 letter from Secretary Vilsack and again at the June 23, 2014 meeting, your agency expressed concern—based on a study conducted in the UK—that some harmful pathogens have already been spread by commercial bees to native bees. That is, for at least some pathogens, the cat may already be out of the bag. As an initial matter, there is substantial evidence that in the United States many bee pathogens and parasites are <u>not</u> ubiquitous and, thus, that the cat is not already out of the bag. For example, Kissinger *et al.* (2011) examined the prevalence of four pathogens in wild bumble bees in Oregon, California, and Illinois and found that wild bumble bees sampled in Oregon were not infected with tracheal mites nor with *Nosema*. The authors also

reported high variability (from 0 to 100 percent infected) in the prevalence of tracheal mites, parasitoids, *Crithidia bombi* and *Nosema bombi* by site. Other recent studies have similarly reported that the prevalence of bumble bee pathogens varies dramatically by site (Gillespie 2010, Morkeski & Averill 2011) and by species (Cordes *et al.* 2012, Koch and Strange 2012, Morkeski & Averill 2011).

Furthermore, recent science explains why this worry alone (i.e. that a wild population has already been exposed to a particular pathogen) should not forestall regulation. In addition to introducing novel pathogens, the use of commercial bumble bees can have the other harmful effects of increasing the prevalence of pathogens in wild populations (i.e. increasing the density of infected hosts) and causing more virulent strains of pathogens to evolve. (*See* Meeus et al. 2011.[1])

For example, recent research in Dr. Sydney Cameron's laboratory suggests that the pattern of precipitous decline of some native North American bumble bee species over the decade since the late 1990s could be attributable to commercial colonies having had a higher prevalence of the pathogen *Nosema bombi*, which spread to wild populations (Cameron *et al.* In Prep.).

I. Recent science confirms that commercial bumble bees harbor pathogens and parasites dangerous to wild bumble bees, and various international examples demonstrate the urgent need to stop their spread.

When tested, United States commercial bumble bee colonies have repeatedly been found to harbor parasites and pathogens harmful to wild bees. In 2010, Morkeski and Averill reported results from testing bumble bees from the commercial vendors Koppert and BioBest. They found the commercially reared bumble bees were infected with *N. bombi, C. bombi, Locustacarus buchneri*, and viruses that also affect honey bees, including DWV (Deformed Wing Virus) and BQCV (Black Queen Cell Virus). Averill (unpublished data) also reported that commercial bumble bee colonies have tested positive for SBV (Sacbrood Virus). Singh *et al.* (2010) reported that commercial bumble bee colonies tested positive for IAPV (Israeli Acute Paralysis Virus).

In 2010, a meeting of stakeholders—including representatives from the two major commercial bumble bee rearing companies in North America, scientists, conservation groups, and a representative from APHIS PPQ—was held in St. Louis to develop a conservation strategy for North American bumble bees. The stakeholders identified the following bumble bee pathogens to be of greatest concern to wild North American bumble bees: *Crithidia bombi*, *Nosema bombi*, *Locustacaris buchneri*, *Apicystis bombi*, *Sphaerularia*, and viruses (including RNA viruses that also occur in honey bees such as black queen cell virus, deformed wing virus, Israeli acute paralysis virus, and Kashmir bee virus). (Cameron *et al.* 2011).

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[1] Meeus et al. explain the myriad ways that commercial bumble bee rearing and the movement of those bees can harm wild bees: "Commercial breeding may lead to declines because commercial colonies may have high parasite loads, which can lead to colonization of native bumble bee populations; commercial rearing may allow higher parasite virulence to evolve; and global movement of commercial colonies may disrupt spatial patterns in local adaptation between hosts and parasites."

In other regions of the world—where the two major North American bumble bee producers also operate—commercial bumble bee colonies have been more widely tested and have routinely been found to be infected with numerous parasites and pathogens, including: *Apicystis bombi, Crithidia bombi, Nosema bombi, N. ceranae,* Deformed Wing Virus, and three honey bee-specific parasites (Graystock *et al.* 2013, Meeus *et al.* 2011, Murray *et al.* 2013). In a 2013 European study, scientists tested commercially produced bees imported into the UK. Although the bees were sold as "disease-free," the scientists found that 77 percent of the colonies tested were infected with at least five parasites and an additional three parasites were present in pollen that was supplied as food for the bumble bee colonies (Graystock *et al.* 2013).

In South America, the commercial bumble bee species *B. terrestris* was first introduced into Chile and has since spread to Argentina (Morales *et al.* 2013, Schmid-Hempel *et al.* 2014). There is considerable evidence suggesting that this commercial bumble bee has parasites that are infecting South America's only native bumble bee and have caused its precipitous decline (Schmid-Hempel *et al.* 2014). Indeed, scientists have found that wherever *B. terrestris* invades, the native bumble bee species disappears (Morales *et al.* 2013, Schmid-Hempel *et al.* 2014).

In Japan, researchers found that commercially raised bumble bees had a higher infestation rate of the tracheal mite *L. buchneri* than wild bumble bees. Their findings also suggested that a European strain of this mite has likely invaded native Japanese bumble bee populations and may help explain its decline (Goka 2010, Yoneda *et al.* 2008).

Other research in Europe, including the study noted by Secretary Vilsack in his April 16, 2014 letter, has found that RNA viruses formerly thought to be specific to honey bees can transfer from honey bees to bumble bees and from bumble bees to honey bees (Singh *et al.* 2010, Furst *et al.* 2014, Graystock *et al.* 2013). In addition, pollen sold with commercial bumble bees has been tested positive for three honey bee specific parasites (Graystock *et al.* 2013). The fact that honey bees are <u>also</u> at risk of infection from the unregulated movement of commercial bumble bees is only further justification for regulation.

These international studies illustrate and warn of the numerous negative consequences for wild bees of the continued unregulated movement of commercial bumble bees in the United States.

II. Next steps

Over a million commercially produced bumble bee colonies are imported annually across the globe to pollinate greenhouse crops (Velthius and VanDoorn 2006). Study after study has confirmed: (1) commercially reared bees spread parasites and pathogens that infect and harm native bees, and (2) there is an urgent need to protect our native bumble bee species from these pathogens and parasites before they go extinct. We greatly appreciate the opportunity to work with you on this important task, and to help support that effort, we have included all papers referenced in this letter. If you have questions about any of these studies or if there is an additional way we can help, please do not hesitate to contact Sarina Jepsen at the Xerces Society by e-mail Sarina@xerces.org or phone (503) 232-6639 ext. 112.

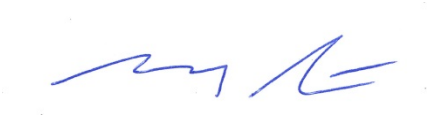
In your recent letter, you referenced the completion of a draft pest risk assessment to evaluate scientific evidence for information on bumble bee pests and diseases in North America. We would very much appreciate a copy of that draft pest risk assessment.

Finally, as mentioned in our July 3, 2014 email, we look forward to hearing from you with a definitive answer as to whether you plan to move forward with regulations governing the interstate movement of bumble bees, and if so, what your timeline for those regulations will be.

Sincerely,

Sarina Jepsen
Endangered Species, Program Director
The Xerces Society

Rebecca Riley
Attorney
Natural Resources Defense Council



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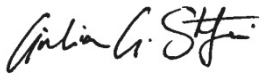

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