Prairie Grasslands are a Hive of Diversity When it Comes to Bees

by Tara Mulhern Davidson

There has certainly been a buzz surrounding bee populations across North America in recent years. With news of honey bee colony collapses and dwindling populations, pollinator conservation starts to hit close to home in Saskatchewan. What role, if any, do Saskatchewan's native prairie grasslands play in the conservation of these important pollinators?

Cory Sheffield, Research Scientist and Curator of Invertebrate Zoology at the Royal Saskatchewan Museum, believes that Saskatchewan's native prairie plays a pivotal role. Sheffield studies bees and other pollinators and says that Saskatchewan's grasslands are important for sustaining the populations of those species. "The Prairie Ecozone is a hotspot for bee diversity in Canada," explains Sheffield. "Almost half of all of Canada's bee species live here. In fact, there are at least 387 different bee species that we know of here, which means that this area has among the greatest diversity for pollinators in the country."

Historically, settlers brought honey bees to North America for honey and wax production, though crop pollination has become the greatest benefit of this introduced species. "Society is able to place an economic and ecological value on bees. We have been able to appreciate the impacts of bees on crop pollination, and we understand that bees play a vital role in food production," explains Sheffield, who also supervises research students as an Adjunct Professor at the University of Regina. "A lot of our native bee species likely play an unrealized and very valuable role in crop pollination," Sheffield says. SK PCAP recently hosted a webinar that highlighted the role of native bees as crop pollinators using Haskap pollination as a case study. This presentation can be viewed at www.youtube.ca/user/skpcap.

Just as all native prairie is not created equally, bees and other pollinators are diverse in their specific needs. Some bees are dietary generalists and rely on a wide range of flowering species throughout the year, whereas others are dietary specialists and rely on a narrow range of plants, sometimes solely on a specific plant species. "The prairies have the highest proportion of these specialist bees; not only do grasslands support a high level of bee diversity but 23% of the bees here are dietary specialists that have specific food plant requirements," clarifies Sheffield. "If prairie grasslands weren't here, almost 25% of these species would not exist here, and the plant communities would thus be affected," he says, adding that bee species may specialize in collecting pollen from willows or goldenrod, for example, or *Helianthus* or *Campanula* plant species, all commonly found on native prairie.

"Our knowledge of bees is still growing," notes Sheffield and says developing monitoring protocols to survey bees is a priority, in addition to identifying all the species that are present in Saskatchewan. "As a researcher, I want to tie things together, look at the bigger picture as opposed to focusing on a specific species," he explains. "We don't measure the impacts of the decline in the number of pollinators on native prairie like we should," Sheffield also adds, noting that at least four or five species of bumble bee in Canada have gone from being very common to rapidly dwindling. "The pollinators and certain prairie plants may rely on one another for survival, so what threatens one, could have an impact on the other," suggests Sheffield.

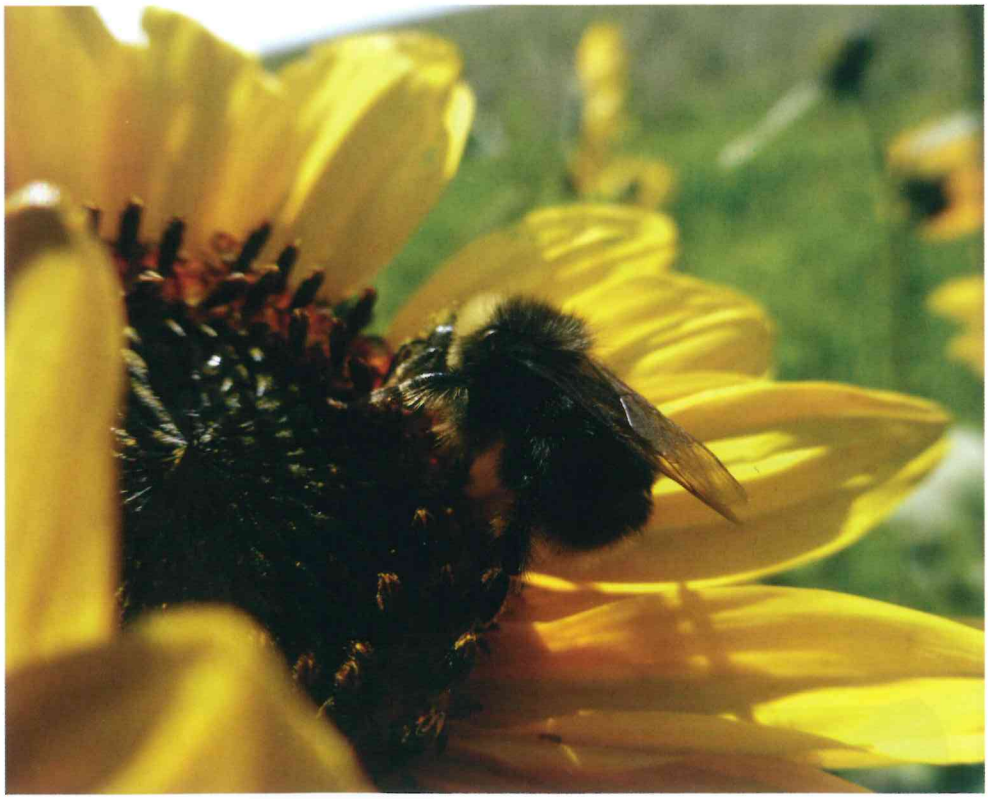

Photo courtesy of Dr. Cory Sheffield

The contributions that farmers and ranchers make to the ecosystem and habitat management is not lost on Sheffield and his colleagues. "Ranchers provide grazing which is an important component of prairie management," says Sheffield. He cites dung beetles as an example of another group of beneficial organisms that have not experienced a significant reduction in diversity on grasslands simply because of the roles that cattle have been performing with grazing. He adds that bees require flowering plant species, and that light-to-moderate grazing may help to support an adequate forb component on prairie grasslands. "Cattle also play a role in seed dispersal through their dung, which may help sustain certain plants that are required by bees," Sheffield says.

Canadian farmers and ranchers who are contributing to the conservation of pollinators are recognized annually through the Canadian Farmer-Rancher Pollinator Conservation Award. The award is an initiative of the Pollinator Partnership, the Canadian Federation of Agriculture and the Canadian Forage and Grassland Association and is awarded to ranchers who make an effort to foster natural ecosystems and provide pollinator habitat. David Ainslie of Ontario was recently announced as the 2015 winner. BB

For more information on Cory Sheffield's research, visit http://www.royalsaskmuseum.ca/blog .

Photo courtesy of Dr. Cory Sheffield