Habitat loss, not poison, better explains grassland bird decline

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Contrary to recent well-publicized research, habitat loss, not insecticide use, continues to be the best explanation for the declines in grassland bird populations in the U.S. since the 1980s, according to a new study by ecologists.

Last year, a pair of researchers linked the drop in the populations of grassland bird species, such as the upland sandpiper and the Henslow's sparrow, to insecticide use, rather than to a rapid decline of grasslands, a more commonly accepted theory. However, after re-examining the data, Penn State and U.S. Department of Agriculture researchers now believe that the loss of habitat continues to be the best explanation, said Jason M. Hill, a postdoctoral research associate in ecosystem science and management, Penn State.

"Many people think of grassland loss as something that happened long ago in North America, but the amount of grassland lost since the 1980s is absolutely staggering, whereas the insecticide use greatly declined prior to the 1990s," said Hill.

The researchers cited earlier studies that documented a loss of approximately 97,000 square kilometers—an area larger than the stats of Indiana—of grasslands in the U.S. between 1982 and 1997 primarily due to the expansion and intensification of agricultural practices.

The researchers were surprised that the other researchers excluded lands from the Conservation Reserve Program lands in their analysis. The

CRP pays farmers to remove environmentally sensitive lands, especially grasslands, from agricultural production. Because grassland bird species tend to do better in states with larger areas set aside in the conservation land program, excluding the conservation land program data may have skewed their results, said Hill.

"We reanalyzed their data in a more statistically-appropriate way, including CRP acreage, and found 1.3 to 21 times more support that habitat loss was more strongly connected to grassland bird declines than insecticide use," said Hill. "Grassland bird trends were positively associated with the acreages of CRP lands and some types of pastures."

Erroneously emphasizing insecticides as the principle cause of grassland bird declines may inadvertently divert attention and funding away from land conservation programs such as CRP, according to the researchers.

"Conservation Reserve Program contracts are not being renewed," said J. Franklin Egan, research ecologist, USDA-Agricultural Research Service, who worked with Hill. "My biggest concern is that we get distracted and lose focus on preserving the remaining grasslands."

Grasslands, especially in agricultural landscapes, also provide tremendous benefits to humans through erosion reduction and water filtration as well as offering habitat to numerous grassland-obligate species from black-footed ferrets to Dakota skippers.

The loss of grasslands is a global problem, according to the researchers, who report their findings in the journal *PLOS One*.

"Grasslands and grassland-obligate species are declining not just across North America, but across the globe," said Hill.

Grassland bird species use the living and dead vegetation in grasslands to

build nests and for use as cover.

"Grasslands are easily converted to farmland for row crops, such as corn and soybeans," said Egan, "Grassland species, with few exceptions, cannot survive on these intensive agricultural lands."

The researchers examined population data of grassland species in the 48 contiguous United States from the U.S. Geological Survey North American Breeding Bird Survey. In addition to information provided by the researchers on the study of insecticides and grassland birds, they also used data from the U.S. Department of Agriculture and the National Resources Conservation Services. Hill and Egan also worked with Glenn E. Stauffer, a post-doctoral scholar in forest resources, and Duane R. Diefenbach, adjunct professor of wildlife ecology, both of Penn State.

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