Beetles lose ground

Carcass, dung eaters are ecological cleanup crews

By James Danoff-Burg
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If you have ever watched forest being cleared for a new building, did you think of the plight of the dung and carrion beetles living there?

If not, you are, of course, not alone. However, when these beetles, which eat dung and dead animals, lose their homes it actually may be hazardous to human health.

Where there are dung beetles, there tend not to be filth flies like house flies, blue and green bottle flies and carrion flies. Filth flies are the most common vectors of several diseases, including giardiasis, cryptosporidiosis, and infestations of tapeworms, nematodes, and fly larvae (an infestation of which is called myiasis).

Dung and carrion beetles also perform a large number of what are called ecosystem functions. By burying dung and carrion, they enrich and aerate soil, disperse seeds and control vertebrate parasites. They also help scientists learn about the diversity and abundance of mammals and birds, since they provide the food source for beetles.

Research in Australia showed that introducing dung beetles on farms greatly reduced myiasis and several other diseases among cattle. Historically, neither cattle nor dung beetles were present in Australia until humans introduced them one after the other. Before the beetles were introduced, filth flies bred in the cattle dung, exploded in population size, and then caused severe disease outbreaks among cattle, and even among some humans working on the farms.

Urbanization in the Hudson Valley has accelerated in the last decade, particularly in so-called bedroom communities like Dutchess and Ulster counties. New homes and stores consume land that was previously in a more natural state and thus better habitats for wildlife, including dung and carrion beetles.

Favor forests over development

My research at the Black Rock Forest in the Hudson Highlands in Orange County indicates that carrion beetles are much more abundant in forests than developed areas. Even something as seemingly insignificant as a little-used unpaved forest road is repellent to carrion beetles. Out of 660 beetles from three different species that were tested, only 23 percent would cross even these simple roads.

This trend increases dramatically on progressively larger roads — from forest roads to paved roads and finally up to a four-lane divided highway. Most species that we found along the forest roads were never present near the highway roadsides. The community of carrion beetles along highways was less than 20 percent the size of that found along the forest roads.

Together with Liz Nichols of the American Museum of Natural History and Fred Koontz of the Wildlife Conservation Society, we are now studying beetles at sites throughout the "New York Bioscape" — a study area centered on New York City, including more rural outlying areas like the mid-Hudson Valley.

Initial research indicates the number of beetle species is greatest in the forested areas and steadily declines toward cities. More importantly, the number, diversity and sizes of the dung beetles all decrease strikingly as we move away from forested areas. The number of filth flies, on the other hand, is greatest in urban areas.

We have not yet demonstrated that urban filth flies increase the incidence of disease. However, we feel confident concluding that when forests are cleared, the ecological shift in dominance from beetles to disease-causing flies is a near certainty.

The question remains: Are dung beetles protectors of your health? Stay tuned — but in the meantime we suggest leaving forests intact and offering a provisional 'thank you' to dung beetles.

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