Rethinking the umbrella species concept

May 2 2018

Brewer's sparrow nest with eggs. Credit: J. Carlisle

According to the "umbrella species" concept, preserving and managing habitat for a single high-profile species also benefits a whole suite of other species that share its habitat—but how well does this really work?

Not all species that share the same general habitat necessarily have the same specific needs, and a new study from *The Condor: Ornithological Applications* finds that habitat management to benefit Greater-Sage Grouse in Wyoming can actually harm some of its songbird neighbors.

Shrub mowing is sometimes done to benefit sage-grouse during their chick-rearing season, when they favor habitat with fewer shrubs and more grass and forbs. The University of Wyoming's Jason Carlisle (now at Western EcoSystems Technology) and his colleagues collected data on the abundance and nesting success of three songbird species before and after shrub mowing in central Wyoming, as well as at un-mowed sites for comparison. Two of the species, Brewer's Sparrows and Sage Thrashers, are "sagebrush obligates" that rely heavily on shrub habitat. The researchers found no Brewer's Sparrow or Sage Thrasher nests in mowed patches, where it may be decades until shrubs have regrown enough to be used for nesting, and the mowing treatment also reduced the overall abundance of Sage Thrashers by around 50%. Vesper Sparrows, on the other hand, are more flexible in their habitat use and were actually more abundant in patches where mowing was most extensive.

"The umbrella species concept is an appealing shortcut," says Carlisle. "However, when conservation practitioners go beyond protecting the umbrella species' habitat and start manipulating habitat conditions to meet the needs of the umbrella species, they risk harm to other species that also rely on those areas." The mowed area in the study was only about five square kilometers, and cost and logistics make in unlikely that this treatment will be implemented on a large scale, so the negative effects of these habitat manipulations are likely more than offset by the positive effects of broader-scale sage-grouse conservation efforts. Still, Carlisle and his colleagues suggest that more monitoring is needed in general of how non-target species fare under umbrella-species management.

"It is clear that the observed effects on 'background' species are not consistent across the range of potential beneficiaries, and that the assumed benefits do not accrue to many," adds Russel Norvell, an Avian Conservation Program Coordinator at the Utah Division of Wildlife Resources, who was not involved with this research. "It is likely these effects will persist, given the relatively slow growth rates in this arid system. While the conservation of Greater Sage-Grouse habitats across its range is likely to encompass much good, local habitat manipulations driven by unexamined assumptions or uninformed by landscape context have much to prove."

More information: Nontarget effects on songbirds from habitat manipulation for Greater Sage-Grouse: Implications for the umbrella species concept, *The Condor: Ornithological Applications*, DOI: 10.1650/CONDOR-17-200

Provided by American Ornithological Society