

Species surrogacy put to the test

AS SOUL MASTER MARVIN GAYE ONCE SANG, “AIN’T nothing like the real thing, baby.” Species surrogacy—using the dynamic of one species to represent the dynamic of another—may not be the data mine it is purported to be, though it has been used historically and is still prevalent in conservation biology. A new study of more than 72,000 bird observations affirms that data about a particular species should be statistically verified and not extrapolated from the behavior and demographics of a different, albeit similar, species. The merits of species surrogacy, a little-tested yet core concept in conservation biology, were called into question by Cushman et al. (2010) and the results are both enlightening and not particularly surprising, given the complexity of any given ecosystem. Resource managers on a small research budget should prepare to be disappointed.

The encompassing question is: Can the abundance of a species be inferred from monitoring the abundance of a different species?

Cushman et al. (2010) say that effective species surrogate relationships “appear to be rare.” Across two spatial scales (plot and sub-basin), neither migratory habits, nor microhabitat association, nor functional grouping created a compelling basis for surrogacy. In a typical grouping (e.g., birds that dwell in an open-canopy forest), the best indicator species explained only 8.8% (range 0.6–35.6%) of variances in abundance. For instance, the western bluebird (*Sialia mexicana*) has the “strongest” surrogacy, but still explained no more than 18.2% of within-group abundance variance—in this case for birds dwelling in open-canopy forests.

Dynamic similarities between indicator species and other species within their possible explanatory groups were few and insignificant, questioning the usefulness of both guild-indicator (species grouping) and management-indicator (locality) concepts. Without an exact hypothesis and explicit links between a top-down and a bottom-up control, the monitoring of any one species cannot be linked to conclusions about a particular ecosystem, only to information about the species itself. As in all things scientific, Cushman et al. (2010) emphasize that the utility of the surrogacy concept must be “demonstrated rather than assumed.”

Reference

Cushman, S. A., K. S. McKelvey, B. R. Noon, and K. McGarigal. 2010. Use of abundance of one species as a surrogate for abundance of others. *Conservation Biology* 24(3):830–840.

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