

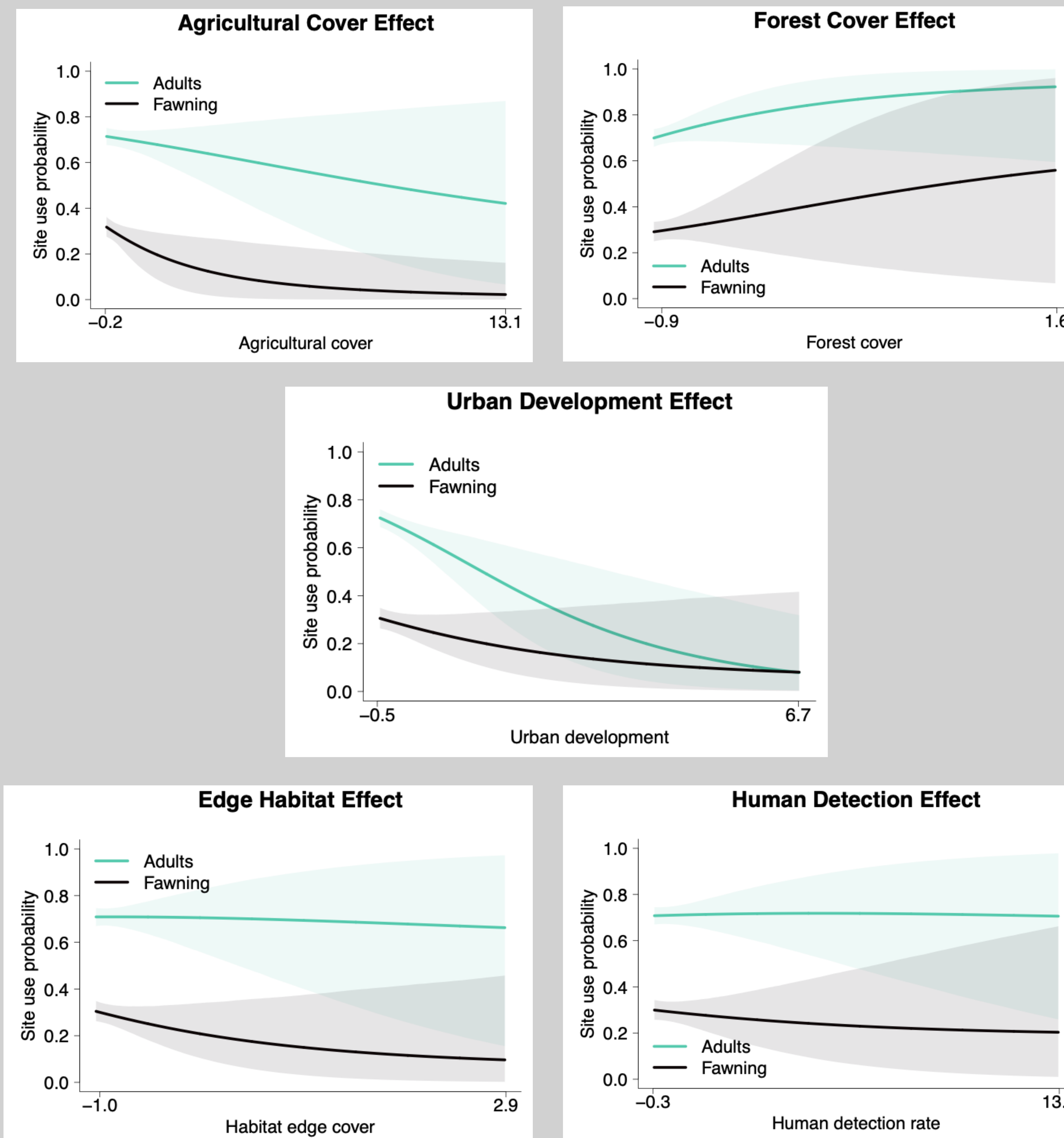
## Introduction

- Many different animal species have been found to alter their behavior when caring for offspring.<sup>1</sup>
- Often, these behavioral changes may lead to increased overall human-mule deer overlap, meaning that the benefit from such a change must outweigh the cost of increasing human interactions.<sup>2</sup>
- For example, white-tailed deer (*Odocoileus virginianus*) have been found to become more diurnal when they have fawns, possibly to avoid nocturnal predators such as coyotes.<sup>4</sup>
- In Utah, evidence suggests that mule deer may become more active in urban areas, especially when raising fawns, and this behavior may also be to avoid predation by coyotes and other predators that generally stay in edge or non-urban areas.<sup>2, 5</sup>
- This study investigates whether mule deer with fawns were more likely to be found in urban areas and near human activities than non-fawning deer.

## Predictions

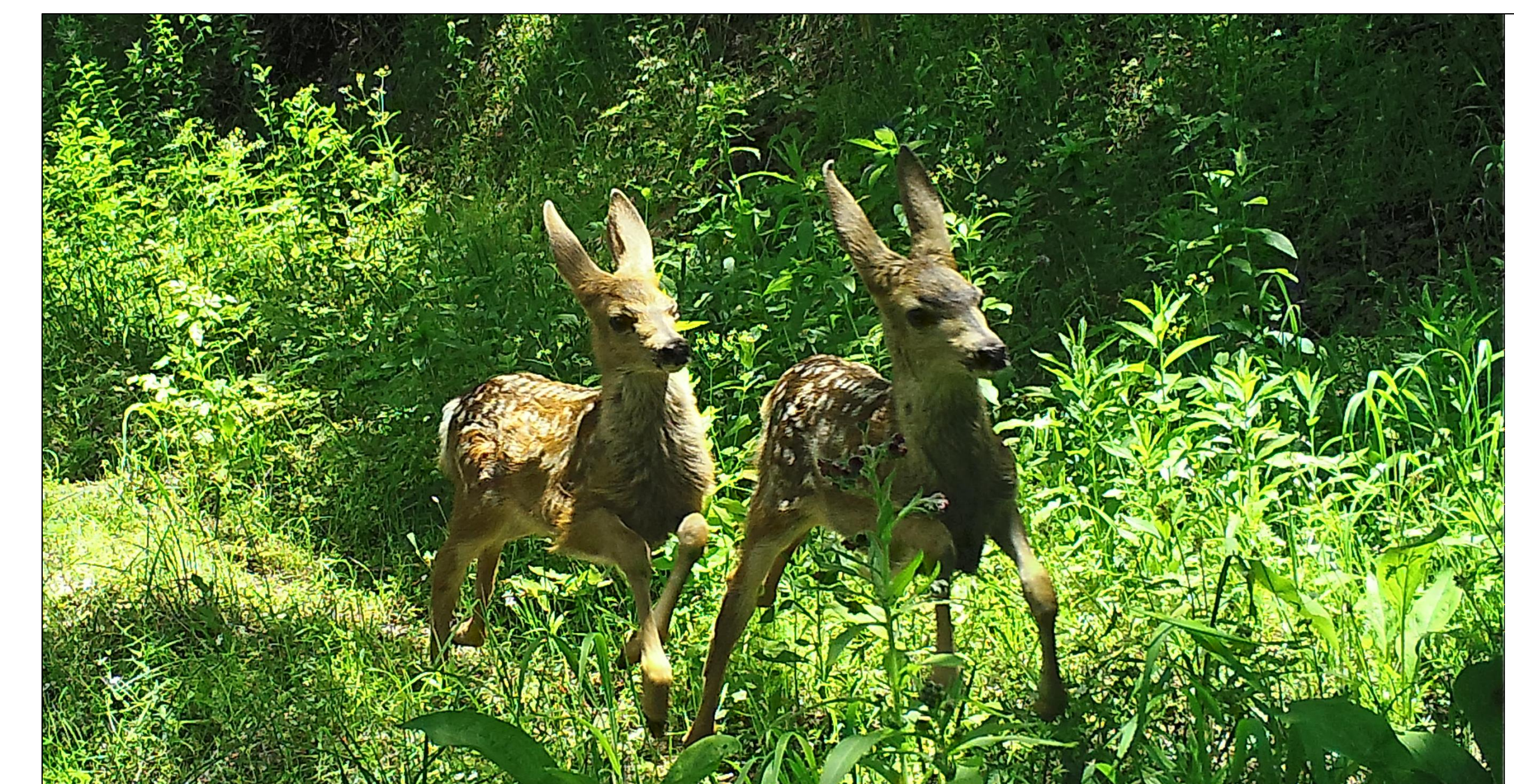
- We predicted that fawning mule deer would occur more frequently in urban areas than non-fawning mule deer in order to minimize encounters with predators.

## Results



## Discussion

- Overall, adult and fawning mule deer had similar reactions to environmental factors, suggesting that habitat is a stronger predictor of mule deer activity than the presence of fawns,
- Both adults and fawning deer have a negative association with urban areas, but fawning deer did so to a much stronger degree, somewhat supporting our initial hypothesis that fawning deer prefer urban areas more so than their non-fawning counterparts.
- Though adults showed no avoidance or attraction to edge habitats, fawning deer were less likely to be found there. This could be due to higher predator presence in these transition habitats.
- Further analysis could be done to directly determine the relationship between fawning mule deer and predators, especially along edge habitat.



## Methods

- We used camera trap data from the Wildlife Watch Dataset, a community-based dataset in the Wasatch mountains from the years 2018-2021.
- We then used a Bayesian hierarchical multi-species occupancy model to compare the behaviors of fawning and non-fawning mule deer in relation to agricultural land, edge habitat, forest cover, urban development, and human activity.
- We grouped detections into 10-day periods to build detection histories for fawning and adult mule deer.

## Citations

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3. Green, A. M., Young, E., Keller, H., Grace, T., Pendergast, M. E., & Şekercioğlu, Ç. H. (2023). Variation in human diel activity patterns mediates periodic increases in recreational activity on mammal behavioural response: Investigating the presence of a temporal 'weekend effect.' *Animal Behaviour*, 198, 117–129. <https://doi.org/10.1016/j.anbehav.2023.02.002>
4. Higdon, S. D., Diggins, C. A., Cherry, M. J., & Ford, W. M. (2019). Activity patterns and temporal predator avoidance of white-tailed deer (*Odocoileus virginianus*) during the fawning season. *Journal of Ethology*, 37(3), 283–290. <https://doi.org/10.1007/s10164-019-00599-1>
5. Holmes, B. R., & Laundré, J. W. (2006). Use of open, edge and forest areas by pumas *Puma concolor* in winter: Are pumas foraging optimally? *Wildlife Biology*, 12(2), 201–209. [https://doi.org/10.2981/0909-6396\(2006\)12\[201:UOQFAF\]2.0.CO;2](https://doi.org/10.2981/0909-6396(2006)12[201:UOQFAF]2.0.CO;2)