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Dear Prof. Cadotte,

We are submitting a manuscript entitled '*Bound Within Boundaries: How Well Do Protected Areas Match Movement Corridors of Their Most Mobile Protected Species?*', co-authored by Dominik M. Behr, John W. McNutt, Arpat Ozgul, and Gabriele Cozzi, for consideration for publication in *Journal of Applied Ecology*. All authors have seen and approved the manuscript and declare no conflict of interests. The manuscript has not been submitted or published elsewhere.
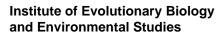
In recent decades, the protection of large natural or semi-natural areas has become a key strategy to maintain and restore connectivity among animal populations. Boundaries of such protected areas are often based on expert opinion and socio-political needs, yet their accuracy and effectiveness are rarely empirically verified. This is largely due to a lack of appropriate movement data, particularly during dispersal, from those species for which such areas have been created.

In this study, we collected dispersal data of the highly endangered African wild dog and showed how such data can be used to verify the adequacy of protected areas. We quantified habitat preferences of dispersing wild dogs and used this information to predict landscape permeability across the world's largest transboundary conservation area, the Kavango-Zambezi Transfrontier Conservation Area (KAZA-TFCA) in southern Africa. We investigated how landscape permeability varies regionally and internationally and compared permeability within and outside the KAZA-TFCA boundaries. Finally, we calculated least-cost paths and corridors, to test whether main dispersal corridors were contained within the boundaries of the KAZA-TFCA.

We showed how pertinent dispersal data of a highly mobile species can be used to empirically evaluate the adequacy of already-existing protected areas or could be used for the planning of future such initiatives. We found that permeability within the boundaries of the KAZA-TFCA was more than double compared to areas outside it. Furthermore, we observed a five-fold permeability difference among the five countries part of KAZA-TFCA. Our results also revealed that all major dispersal routes are within the designated boundaries, highlighting the potential value of such an initiative.

Our approach is neither limited to the African wild dog, nor to our study area. We therefore anticipate that it will be of interest to the broader readership of *Journal of Applied Ecology*. We collected environmental data that are readily available on a global scale, implying that future studies could easily adapt and expand a similar framework to other species and regions. Expanding this analytical framework to additional species will yield important insights on the consistency of inter-specific movement corridors, thus highlighting areas that are exceptionally valuable for the conservation of several species. In fact, our network of corridors for African wild dogs shows important similarities to corridors of dispersing lions inhabiting the same ecosystem.

We look forward to your reply and thank you for your time and consideration of the manuscript.

Sincerely,

David Hofmann, on behalf of all co-authors