Point Blue Publication Brief

Identifying conservation corridors that benefit Southern California Spotted Owl populations

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Increasing connectivity among wildlife habitat patches is a commonly considered solution to the problems of climate change, land use change, and changes in disturbances such as fire. When habitat patches are connected by corridors, individuals can move to other patches when there are no longer the necessary resources (e.g., nesting sites) within its existing patch. Despite the importance of connectivity, deciding where to restore habitat to increase connectivity is complicated.

To help conservation decision making for Southern California Spotted Owls, we created population models that considered key characteristics important to prioritizing where to place corridors. While most connectivity approaches "map" corridors without considering their impact on populations, our models included owl births, deaths, and ability to move (disperse) among patches in Southern California. Considering each corridor within the network of owl populations, we quantified whether individual corridors were irreplaceable (i.e. providing connections that were not available via other corridors in the network), whether the corridor could provide local and/or regional abundance increases, and whether the corridor would be resilient to climate change.

We identified two corridors likely to increase Spotted Owl abundance under the current climate assuming additional, focused restoration could make these corridors suitable for owl dispersal. The best corridors connected two large populations on similarly-sized patches. One of the two corridors was replaceable and the other was not. Additionally, we identified two more corridors that benefitted the population at the local scale. With the addition of the local corridors, adjacent habitat patches increased in abundance even though the regional abundance was not significantly increased.

None of the corridors were resilient to climate change. A large fraction of owl habitat was predicted to be lost because the climate would no longer be suitable for owls. Habitat loss resulted in distances between patches too far to traverse. However, we may have overestimated the impact of climate change because forested owl habitat may remain for decades after climate warming.

Our models advance connectivity decision making for species of conservation concern by quantifying important criteria for corridor identification and prioritization, namely: a corridor's irreplaceability, its local versus regional benefit, and its resilience in a changing landscape.

Main Points

- Modeling the benefit of corridors to Spotted Owl, we identified two corridors – one which was irreplaceable – that have the potential to increase overall owl abundance in Southern California by connecting two large owl populations.
- We also identified two more corridors that provided local abundance increases.
- None of the corridors we identified were resilient to climate change: with or without corridors, there were large owl population declines under climate change.
- Overall, our results highlight the importance of conserving existing Spotted Owl habitat and suggest locations for modest restoration to increase the mixing of individual owls between two important patches.

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