

Chapter 5. Future Work and Conclusions

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5.1. Future Work

The Connectivity Analysis for the Columbia Plateau Ecoregion follows two other products of the WHCWG's *Washington Connected Landscapes Project*, the *Statewide Analysis* (WHCWG 2010) and the *Climate-Gradient Corridors Report* (WHCWG 2011). Both publications identify future work the WHCWG is planning on carrying out, including comparing focal species and landscape integrity results to better understand how they complement each other; validating focal species models using field data; and developing a suite of climate analyses and interpretation tools to inform regional wildlife management and land-use planning decisions. Additionally, the WHCWG expects to apply the approaches and lessons learned in the Columbia Plateau Ecoregion to other areas within and around Washington. In the Columbia Plateau, planned work includes:

LINKAGE MODEL VALIDATION

- A Greater Sage-Grouse project that is currently underway under the leadership of Washington's Department of Fish and Wildlife (WDFW). This project has three elements: (1) examination of model predictions and Greater Sage-Grouse movements using radio-telemetry data, (2) examination of model predictions and patterns of lek persistence, and (3) genetic analysis of Greater Sage-Grouse populations in Washington to relate patterns of gene flow to landscape resistance.
- Washington Department of Fish and Wildlife's Eastern Washington Mule Deer project. This project has four areas of study: (1) examination of relationships between mule deer habitat quality, body condition, and reproductive potential; (2) examination of model predictions and habitat use by mule deer using radio-telemetry data; (3) examination of model predictions and movement patterns by mule deer using radio-telemetry data; and (4) genetic analysis of mule deer populations in Washington and the application of landscape genetic analyses to relate patterns of genetic relatedness between mule deer populations to patterns of landscape resistance.
- Despite nearly three decades of work on corridors it is still largely unknown whether or not conserving connectivity will work to promote long-term gene flow and demographic exchange across highly impacted landscapes. In a first of its kind study, researchers at Northern Arizona University have identified nearly 100 landscapes that contain de facto conservation corridors (landscape configurations that resemble conservation corridors in size and context, but which exist as a quirk of the way the landscape was developed) and plan to test conservation corridor efficacy. One of these study landscapes is the Moses Coulee–Mansfield Plateau area that is part of the Columbia Plateau's Connected Backbone. This study will provide useful baseline information on the effectiveness of arid lands linkages established in Douglas County.

FUTURE ANALYSES

- Led by The Nature Conservancy, we are developing novel tools that can be applied to the habitat and resistance models of the Columbia Plateau analysis to identify: (1) critical barriers that can inform restoration priorities, (2) core areas and linkages with high centrality, whose loss could disconnect large portions of the network, and (3) “pinch points” within individual linkages, whose loss could sever an existing connection between core areas. The WHCWG will use these tools to run analyses most useful to entities working on connectivity conservation in the Columbia Plateau.
- As part of our efforts to identify linkages that may improve species’ abilities to adapt to climate change, we will be (1) re-running the Climate Gradient Corridor analysis (WHCWG 2011) using the ecoregional-scale Columbia Plateau landscape integrity network, (2) synthesizing the statewide and Columbia Plateau Climate Gradient Corridor networks with focal species networks and other relevant layers, and (3) developing interpretation materials to help guide implementation of these new products. These climate change related portions of the WHCWG’s work are being led by researchers at the University of Washington.

IMPLEMENTATION

- We will provide scientific support to the Arid Lands Initiative as they define priority areas to focus implementation of conservation strategies directed at “*conserving and restoring a viable, well-connected system of eastern Washington’s arid lands and related freshwater habitats, sustaining native plant and animal communities, and supporting compatible local economies and communities.*”

5.2. Conclusions

The goal of the Connectivity Analysis of the Columbia Plateau Ecoregion was to identify the most important areas for maintaining and enhancing wildlife habitat connectivity across the ecoregion. We achieved this goal through a landscape modeling effort that produced connectivity networks for 11 focal species—selected to represent the main vegetation types in the Columbia Plateau—and a composite landscape integrity network based on four models that differed in the relationship between landscape integrity and resistance to movement of species or processes (such as fire or seed dispersal). The main highlights of the Connectivity Analysis of the Columbia Plateau are:

- This ecoregional analysis confirms and refines the general findings of the statewide connectivity analysis, bringing them a step closer to directly informing on-the-ground efforts to conserve connectivity, by providing information to prioritize regions most important for maintaining and enhancing connectivity across the ecoregion. This replication and refinement allows us to articulate a vision for a connected landscape with confidence and to highlight particular areas in need of specific attention.
- Our results identify areas that play an important role in keeping arid lands in Washington connected. The convergence of results from the focal species and landscape integrity approaches suggest that the identification of these important connectivity areas is robust to the underlying assumptions of the analysis.

- Building from these important connectivity areas, we articulate a vision for a connected landscape across Washington’s arid lands. This vision includes two broad regions—the Connected Backbone and the Braided Scablands Swath—and critical complex linkage zones that connect these regions to one another and to neighboring jurisdictions and ecoregions.
- The vision for a connected Columbia Plateau has yet to be achieved, but provides an important foundation for developing connectivity conservation strategies in the Columbia Plateau Ecoregion. Though the focus of this analysis is based on current conditions, we recognize that conserving and restoring connectivity in this region may be especially important in light of a changing and uncertain climate.
- We provide some recommendations as examples of how to use these results to inform decisions targeting the conservation and restoration of habitat connectivity in the Columbia Plateau. Entities and stakeholders in particular areas are best suited to identify what actions should be implemented in pursuit of these recommendations.
- This report is not prescriptive. We encourage users interested in incorporating connectivity into their efforts to consider the wealth of information provided by this project, to determine how these results can best help them achieve their goals, objectives, and priorities.
- Users interested in directly applying these results to their local area should evaluate whether the information provided here is sufficiently detailed and validated to support informed decisions at the local scale. Where it is insufficient, users should consider collaborating with other interested stakeholders to validate the results, or to develop fine-scale linkage designs to identify specific sites in which to implement particular actions.
- We consider the focal species and landscape integrity approaches to be complementary. As stated above, the general similarity in spatial patterns resulting from these approaches suggests they are robust to differences in the underlying assumptions of each approach. In this landscape, and at this scale, the focal species networks provide a level of specificity and depth to the results that we expect will be extremely useful not only to entities interested in conservation of these particular species, but more broadly to those interested in species with similar habitat needs and movement capabilities. We recognize, however, that focal species analyses are both time- and data-intensive, and that entities interested in understanding connectivity in other landscapes and at other scales may not have the necessary resources available. The WHCWG, through this effort and the statewide analysis (WHCWG 2010), are providing numerous datasets for fruitful comparison between these approaches at two different scales. Such comparisons are critical to determine under what conditions the less resource-intensive landscape integrity approach could provide sufficient specificity on its own to help guide connectivity conservation decisions.
- A few notable differences between focal species and landscape integrity results allow us to pose important questions about the connectivity functions provided by mixed native and agricultural areas. Field validation of the focal species models and efforts to better understand the value of agricultural landscapes may become the foundation for innovative approaches to simultaneously achieve production and conservation objectives.

We are already moving forward with further work based on the results of the Columbia Plateau analysis to validate the models, and providing these results to inform conservation decisions different entities are making across this landscape. We also support and encourage current and future efforts to (1) improve our understanding of the value agricultural landscapes provide for connectivity, and (2) develop linkage designs where needed to guide local collaborations and action. Our over-arching goal is to provide the information needed to effectively conserve habitat connectivity, so that Washingtonians can continue enjoying healthy and diverse wildlife populations in this modern world and into an ever-changing future. We expect this analysis to help and support the development and implementation of innovative strategies and efficient and effective efforts to help fulfill the vision of a connected Columbia Plateau in Washington.