

Decision-Support for Conservation: Minimizing Ecological Impacts in the Tehachapis & Southern Sierra Nevada

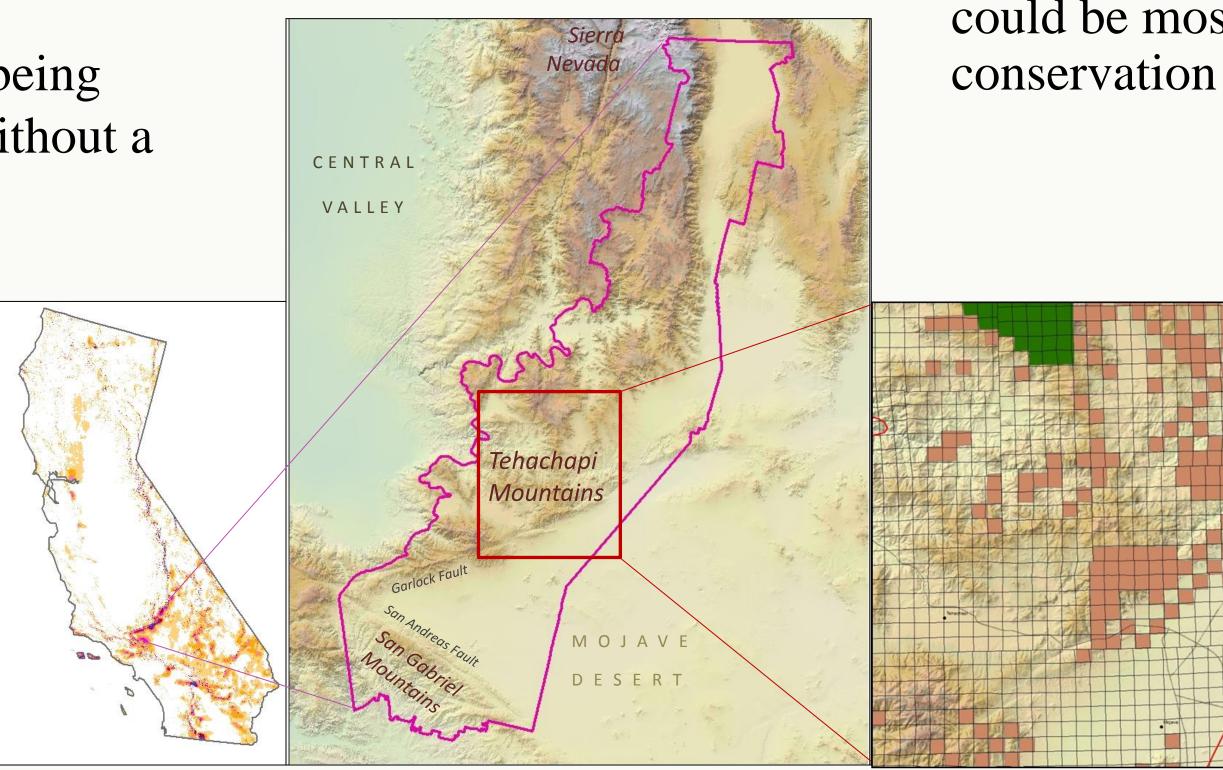
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Background

The Tehachapi Mountains & southern Sierra Nevada are valued as a biodiversity hotspot, bird and bat migration corridor, and landscape critical to the linkage and functioning of four distinct ecoregions—the Mojave Desert, Sierra Nevada, South Coast, & Central Valley.

Wind energy and other development are being evaluated on a project-by-project basis, without a regional perspective.

Conservation Biology Institute (CBI) synthesized available data and evaluated landscape-scale



Objectives

- Assemble regional datasets to support cumulative impact analyses
- Assess landscape-scale conservation values across the region
- Identify where new development projects could be most compatible with assessed conservation values



Methods

CBI integrated over 50 datasets into a hierarchical logic model. EEMS (Environmental Evaluation Modeling System), a customized modeling software, was used to assess relative conservation values, based on intactness, connectivity, biodiversity, and disturbance. To address the paucity of bird and bat data, riparian & wetland communities and specially designated areas were used to represent areas where these species likely congregate.

conservation values across a 4.8 million acre study area (Fig. 1) to create a regional perspective for planning and permitting.

Figure 1. Wind potential is high within the focus area (dark pinks & blues on left; NREL). Analysis was conducted on a one section (1 sq mi, 640 ac, 259 ha) grid (above right).

Logic Model

CBI's web-based, data-sharing & mapping platform Data Basin was used to facilitate review and updates of ~250 public regional datasets. A hierarchical logic model was created to evaluate biological potential and level of disturbance across the landscape based on conservation values expressed by agency staff. The logic model (below) documents the decision rules and datasets that define the analysis process. It gives a conceptual framework that can easily be modified and used for future decision-making.



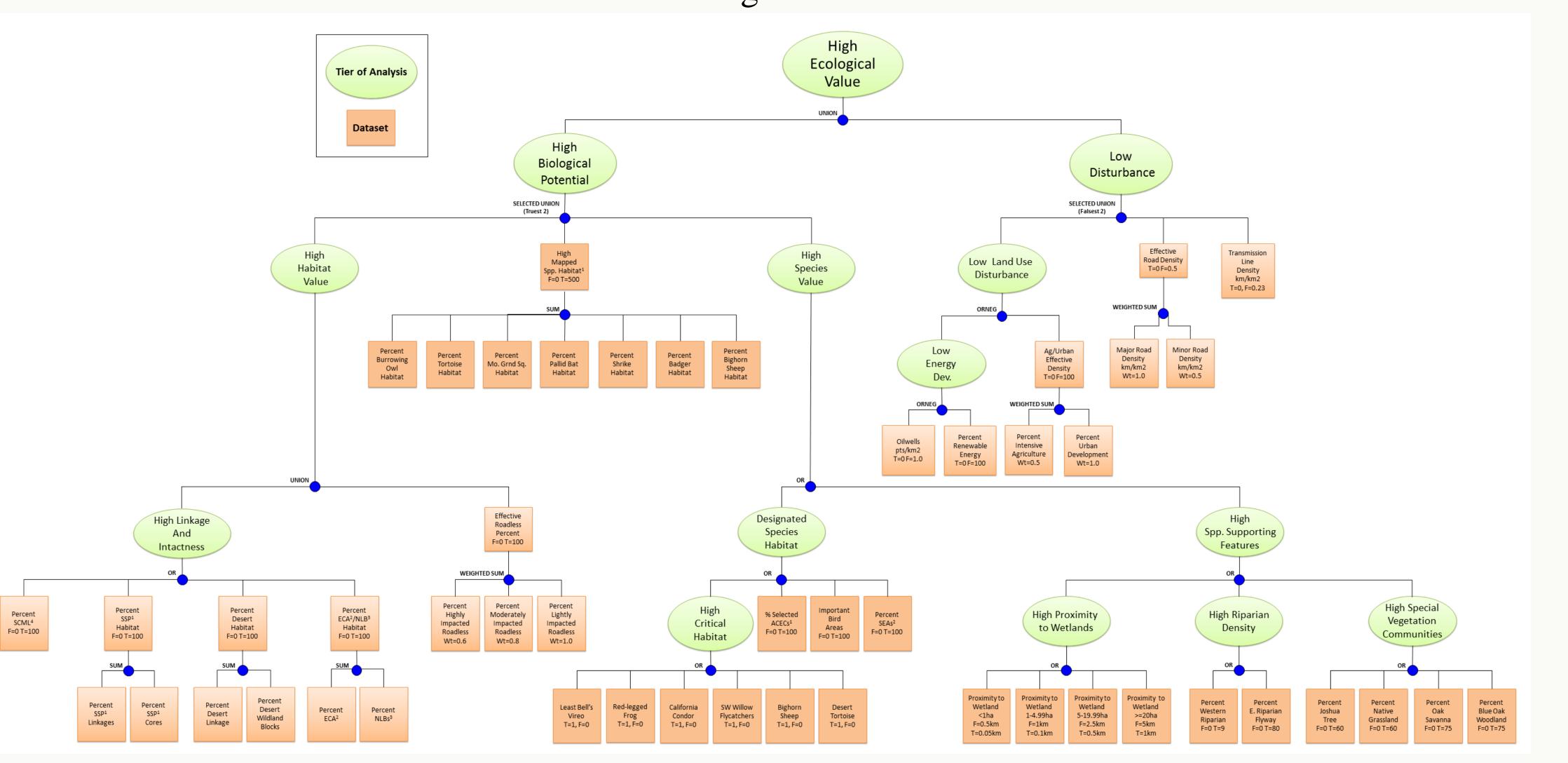


Figure 2. Wind energy development (above) in areas with sensitive species (below). Understanding the relationship between model components can help land managers make decisions about which areas are more suited for conservation; which areas are more suited for development; and which areas could benefit from additional management.



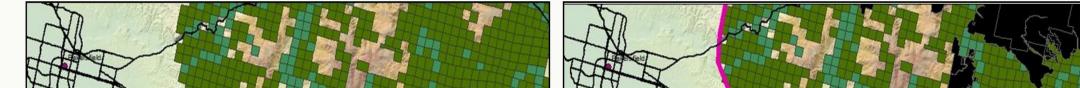
Results & Discussion

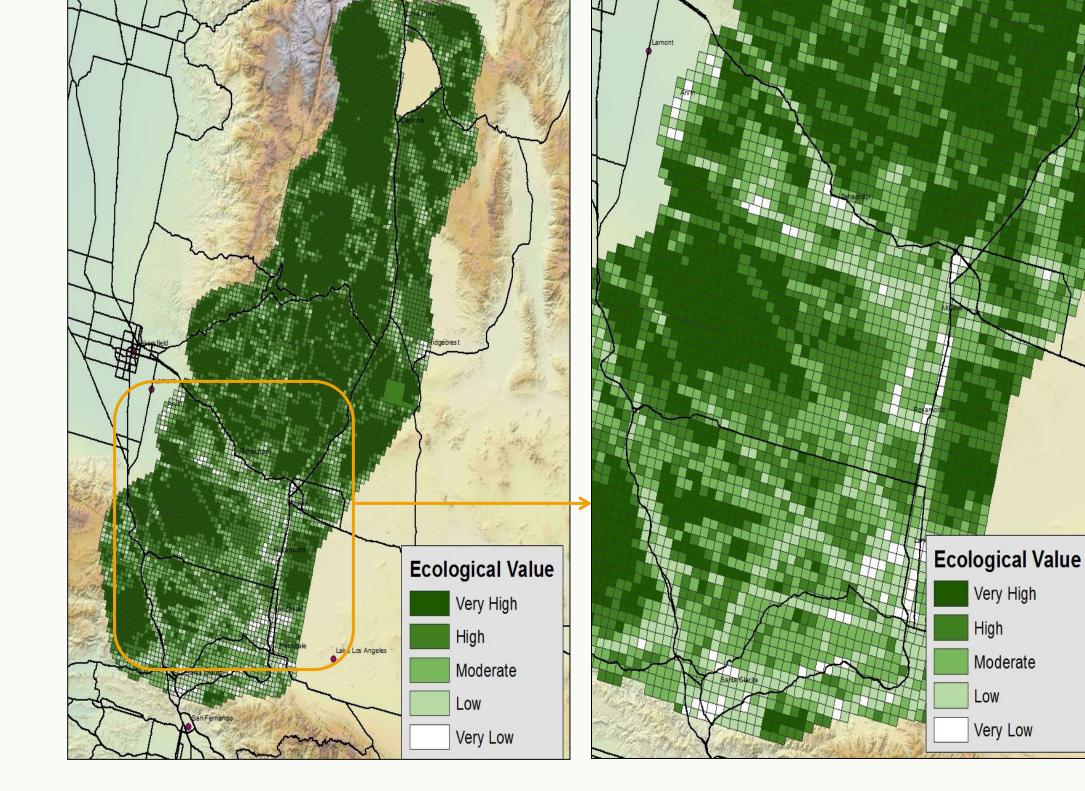
The maps shown below present (A) ecological value and (B) biological potential & level of disturbance generated by the logic model. Results confirm the high ecological value of the focus area, with 72% ranking as very high biological potential with low levels of disturbance. High value lands that may benefit from management of disturbance levels cover 24% of the area, and 4% of the area has high biological potential but is highly disturbed. These results & intermediate datasets can be explored on Data Basin and utilized to inform land management, reserve design, & energy development decisions.

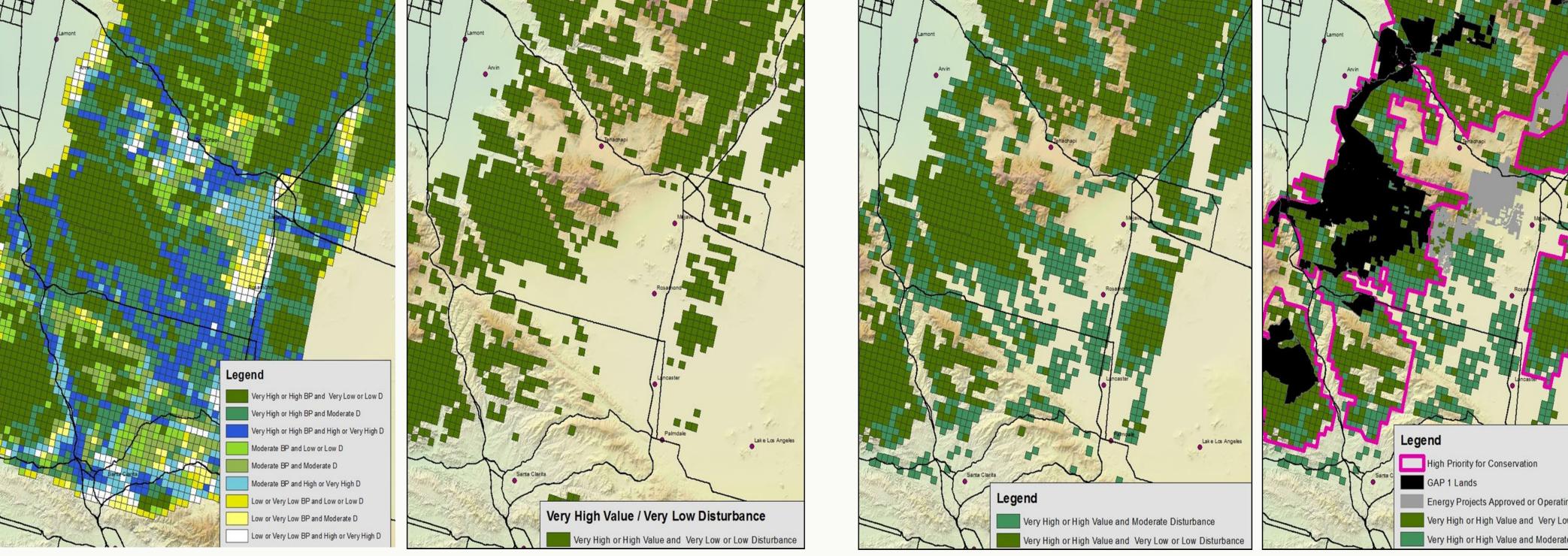
Ecological Value



High Priority for ConservationDraft Reserve DesignHigh biological potential & low disturbance sections with Gap 1 Conservation Lands.







For more...

VISIT Data Basin www.databasin.org JOIN the Wind, Wings and Wilderness group on Data Basin

LEARN about **EEMS Model Software**:

http://consbio.org/products/tools/environmental-evaluation-modeling-system-eems

