

Local wilderness corridors help species avoid isolation and extinction

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To most passers-by, the vast valley that drains into Lake Henshaw offers little more than a scenic diversion on the way to Julian.

But to wildlife scientists, it's one of the 15 critical wildlife corridors left in Southern California because it connects Palomar Mountain and Anza-Borrego Desert State Park.

Yesterday, after six years of work, South Coast Wildlands and about 20 partner groups released the most comprehensive assessment ever done of the region's habitat links and created what is likely to be a national model for conservation planning.



JOHN GIBBINS / Union-Tribune
A view to the east from Cuyamaca shows the San Felipe Valley, a key wildlife pathway.

"This really is the leading edge," said Paul Beier, a co-author of the linkages document and a conservation biologist at Northern Arizona University. "We have done a great job of making a scientifically rigorous assessment (of) what lands will best serve the needs of all native species."

Using geographic information systems and more than 60 academic studies, the South Coast Missing Linkages Project offers detailed maps of the pathways that connect the large patches of open space owned mainly by state and federal agencies. The central goal is to enhance the movement of plants and animals between segments of more than 18 million acres of protected lands.

Mountain lions are of special concern because they require large areas to roam. Researchers used radio-collar tracking studies to identify the routes the lions already use and target those lands for special protections from development.

Graphic:



[Southern California wildlife links \(PDF\)](#)

Three of the wildland linkages are in North County and three more – which have yet to be mapped in detail – cross the U.S.-Mexico border. The others stretch as far north as Bakersfield, where thin strands of habitat connect the Sierra Nevada mountains to the coastal range.

The maps are both heartening and sobering. They show that Southern California – one of the world's biodiversity hot spots – still has enough open space to support a wide range of native plants and animals. However, they also provide a reminder that if those linkages are broken, species will become isolated in smaller and smaller pockets of land.

“The exciting thing for me is that we ... can have 20 million people coexisting with intact wildlands. We haven't lost them yet,” Beier said.

Project proponents said the pathways will help agency officials and conservation leaders focus on the most important areas to safeguard. For instance, county officials are consulting the maps as they create two large-scale species conservation plans for north and east San Diego County.

The maps also can be used by the California Department of Transportation to locate places where improvements such as bridges and stream culverts could be designed to help the movement of wildlife. In addition, the maps support conservation leaders' long-standing vision of a “vegetated land bridge” over Interstate 15 near Fallbrook as a way to facilitate migrations for mountain lions and other species.

The pathways are taking on increasing significance as global warming alters habitats.

“As we protect these linkages from the valley floor to the mountains, there will be some escape routes for species” to find suitable microclimates at higher elevations, said David Van Cleve, a senior official with The Nature Conservancy in San Diego.



BADGER



QUINO CHECKERSPOT BUTTERFLY



MOUNTAIN LION



BIGHORN SHEEP



GOLDEN EAGLE

Movable feets: These are some of the 109 “focal species” whose movements were studied by scientists mapping Southern California's wildlife corridors.

Creating a network of conservation areas is a departure from old-school ecology, which relied heavily on government agencies such as the National Park Service setting aside huge chunks of property. That's not viewed as practical these days.

"It's much more efficient both in terms of economics and in terms of biology to create linkages between the existing reserves," Van Cleve said.

That approach relies on cooperative agreements with private property owners. Land conservancies, working with state and federal agencies, commonly provide financial incentives for landowners to limit development or improve the habitat on their parcels.

Thanks to the linkage blueprint, that can happen in a targeted and scientifically defensible way.

The new atlas has its roots in a statewide conference eight years ago that included some 200 land managers, scientists and conservationists. They identified 232 linkages statewide – a number that was too big to tackle all at once, said Kristeen Penrod, conservation director at South Coast Wildlands, a nonprofit group in Los Angeles that coordinated the pathways project.



JOHN GIBBINS / Union-Tribune
Conservationists hope to ensure that the Boucher Hill area of Palomar Mountain State Park stays connected to open lands to the west, including Camp Pendleton.



JOHN GIBBINS / Union-Tribune
The valley that drains into Lake Henshaw is one of 15 critical wildlife corridors identified and mapped by conservationists.



David Van Cleve of The Nature Conservancy and Kristeen Penrod of South Coast Wildlands were among experts involved in the project, which brought together about 20 partner groups.

She and her colleagues whittled the number down to 15 Southern California links that "are so important that if even one fails, the biological integrity of the entire region would be compromised."

At first, the links were nothing more than arrows on a map. But over time, conservationists have refined the corridors down to a matter of meters.

Doing that took several steps, starting with the selection of 109 "indicator species," including black-tailed jack rabbits, badgers, golden eagles and white alder.

Next, the scientists performed what they call a "landscape permeability analysis," a computer technique that models the difficulty that the various species would have moving between large conserved areas. Factors include vegetation types, elevation, slope and road density.

Making a connection

- The creation of the "missing linkages" for Southern California involved five steps:
- Selection of 109 focal species that represent the diverse needs of the region's plants and animals.
- Analysis of elevation, vegetation, road density and other factors to define the best routes between preserved lands.
- Identification of priority areas needed to maintain the links.
- On-the-ground investigation of the models.
- Compilation of analyses and fieldwork into final maps.

The best potential route for each species was combined with the others to create the most favorable path for all modeled plants and animals.

After that, the scientists factored in the size of habitat parcels in the pathways and whether they are close enough to benefit the species.

Researchers then checked the models during field trips and documented migration barriers such as roads.

In addition to generating maps, South Coast Wildlands and its partners offered several recommendations for how to improve the habitat connections. They include: designing road culverts to maximize wildlife use, encouraging the use of native plants by residents, enforcing leash laws on public lands to reduce predation of wildlife, and stopping illegal use of off-road vehicles.



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Tom Oberbauer, chief of multiple species conservation planning for the county, and Mary Loquvam, executive director of South Coast Wildlands, toured areas covered by the mapping effort.

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Now that the South Coast report is done – at the cost of about \$700,000 – Penrod and others aim to export their analytical approach.

“Let’s do the rest of California at the level of detail that actually provides an implementable vision,” she said.