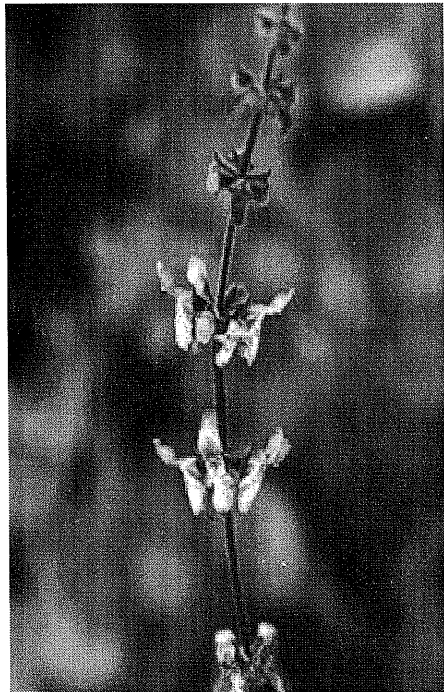


# Ecology

The land above the Caldecott Tunnel is the only significant habitat linkage or wildlife corridor across Highway 24. It is critical for the passage of large carnivores and other wildlife between the two relatively large open space areas that remain in central Alameda and Contra Costa Counties. It is also an important conduit for genetic interchange among the plants and smaller animals with restricted home ranges that are found in these areas. However, as will be explained in this section, the Caldecott Corridor is much more than a channel for wildlife movement, it is a linchpin in the future survival of many wide-



Mint (Dale Sanders)

ranging species and a key factor in maintaining balanced ecosystems in the East Bay.

The Caldecott Corridor connects two virtual islands of contiguous open space, one north of Highway 24 and one south of Highway 24. The northern area or "habitat patch"

includes the lands in and near Tilden, Wildcat Canyon, and Briones Regional Parks, the EBMUD lands in the San Pablo Reservoir, Briones Reservoir, and Pinole Creek watersheds, and the private agricultural lands within the designated Briones Hills Agricultural Preservation Area<sup>1</sup>. The southern habitat patch includes Sibley, Huckleberry, Redwood, Chabot, and Las Trampas Regional Parks, the EBMUD lands in the San Leandro Creek watershed, City of Oakland parklands such as Joaquin Miller Park, and intervening private agricultural lands. Both patches are almost entirely isolated from other habitat areas and each other by highways and East Bay cities, except for the connection provided by the Caldecott Corridor<sup>2</sup> (see Figures 2a and 2b).

## Effects of Habitat Fragmentation:

Limiting or preventing the fragmentation of habitat is essential if healthy, functioning ecosystems are to be maintained. This is because habitat fragmentation can increase the rate at which species become extinct in an area. Some reasons for this elevated extinction rate are the following:

- the fragments may be too small to provide the food and shelter required for individual members of a species to survive;
- isolation may weaken species genetically by causing inbreeding;
- fragmentation may prevent connections to the multiple types of habitat some species require for survival; and
- isolated habitat may only support small populations of certain species, making them vulnerable to chance extinctions from disease, fire, gender imbalance, etc..

When a species is eliminated from a natural system, interspecific relationships and balances that have evolved

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1 In April 1988, the Contra Costa County Board of Supervisors and the City Councils of seven cities in the western and northern portions of the county signed the Briones Hills Agricultural Preservation Agreement, pledging not to urbanize an approximately 40,000 acre area of parks, ranch, and watershed land.

2 Both habitat patches may have tenuous connections to other areas. This is more likely to be true for the southern patch, as wildlife may be able to move in and out of that patch by crossing I-580 at one of several underpasses or in other locations. The northern patch may be completely isolated, but the shoreline of the San Francisco Bay and Estuary offer potential connections to other areas, particularly to the open space of the Concord Naval Weapons Station and Mt. Diablo via the substantially developed Martinez shoreline.

for thousands of years are disturbed. The impact on natural communities is especially great when the removed species is a top predator, as these animals serve a crucial function by regulating the population sizes of their prey species. Since habitat fragmentation generally harms top predators more rapidly than other species, the process of isolating habitat areas can degrade entire natural communities even though only a handful of species are affected initially. For instance, if top carnivores like coyotes and mountain lions became locally extinct (extirpated), populations of deer and some other prey species, as well as so-called mezopredators like raccoons and weasels, might destabilize. Such populations swings would disrupt vegetation growth, seed dispersal, and other ecological processes. Habitat fragmentation can also have direct impacts on small animals with a limited home range and even plants when such species are already rare or are found only in a relatively small area. Like top predators, these species can become extirpated or even extinct when the exchange of genetic material necessary to avoid inbreeding depression is cut off by a barrier either to movement or to seed dispersal<sup>3</sup>. Recognizing the severe ecological disruptions caused by habitat fragmentation, many ecologists urge the preservation and/or restoration of habitat connectivity, even if this can be achieved only with narrow habitat strips or corridors connecting otherwise isolated patches.

**Species That Need the Corridor the Most:**

The species most dependent on the Caldecott Corridor for long-term survival in this area are top terrestrial predators: mountain lion, bobcat, coyote, gray fox<sup>4</sup>. The western badger could also be dependent but may no longer be present in the central East Bay. Abundance estimates for top predators (other than badger) in the

Species	Home Range (km <sup>2</sup> )	Population Density (indiv./km <sup>2</sup> )	No. of Indiv. Per 190 km <sup>2</sup> Habitat Patch in East Bay
mountain lion	65-285	0.003-0.05	1-9
bobcat	5-95	0.05-0.1	10-19
coyote	3-97	0.02-0.15	4-29
gray fox	0.13-7.7	<0.38	<73
badger	unknown	unknown	unknown

Table 1. Rough Estimates of Home Range, Density, and Patch Population for Some East Bay Predators.

Sources: mountain lion-- Anderson (1983) & Hopkins (1989); bobcat-- Zezulak and Scwab (1979); Coyote-- Springer and Wenger (1981) & Murie (1940); Gray fox-- Trapp and Hallberg (1975)

two East Bay habitat patches are provided in Table 1. Mountain lions would have no chance of surviving in the northern East Bay habitat patch if it became completely isolated from the southern patch<sup>5</sup> because their estimated abundance is extremely low and, furthermore, the northern patch may not contain sufficient habitat for a male mountain lion (Barrett, 1996).



Grey fox with chicken wing photographed by automatic camera in 1992 in the Corridor (J. Kopchik)

3 For this reason, some ecologists suggest the use of the term “conservation corridor” rather than “wildlife corridor” to convey the broad ecological function of these habitat linkages. “Wildlife” sometimes is interpreted as referring to animals only.

4 Red fox may also depend on the Corridor, but are a non-native species considered to be a pest by some.

5 Mountain lions could conceivably reach the northern patch from other habitat areas such as Mt. Diablo. Mountain lion tracks and a deer carcass were observed near the McNabney Marsh and the Benicia Bridge in 1999 (Malamud-Roam, 1999).