Charismatic mega-vertebrate

Checkerspot butterflies: Movements across Coyote Valley

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Sierra Azul Workshop

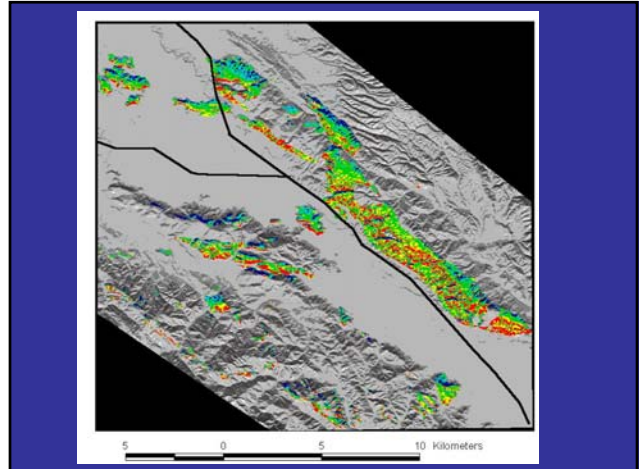Hostplants and Nectar Sources

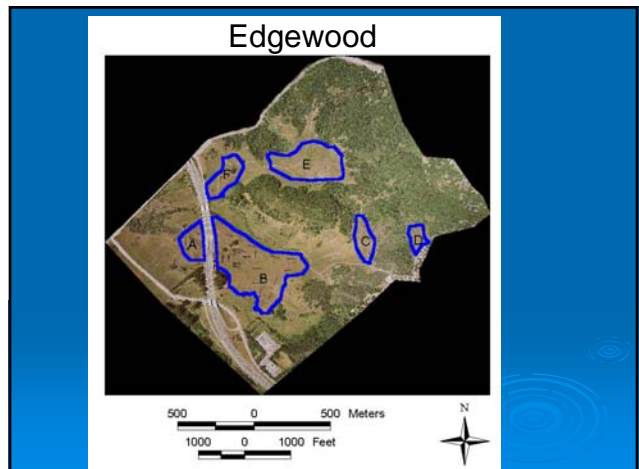Serpentinite forms discrete patches of habitat

Observations

- Bay checkerspots have (at least) 2 modes of movement
- Everyday movement – "random walk" among nectar sources, hostplants, mates, thermal environment
- Dispersal-mode – more directional, fewer turns, faster flight
- "Reluctance" to leave true habitat, but switch modes when outside serpentine grassland
- Dispersal through suburbia is unknown

Pattern and inference

- Core-satellite metapopulation, Coyote Ridge and smaller patches
- Small patches went extinct during 1975-1977 drought
- Distance to core best predictor of occupancy in 1987, also size and topography
- Population sizes ranged from 10 to 400, proportional to size and topography
- Inferred recolonization across Coyote Valley
- Harrison et al. 1988

Edgewood

Data 1

> Bay checkerspot sedentary within continuous habitat - <5% transfer over 500 m, <0.1% over 1500m (12,000 butterflies handled on Coyote Ridge 1986)

> < 5% transfer rate between JRH and JRC (500m apart separated by chaparral and oak woodland, some grassland

> Butterflies cross I-280 at Edgewood, transfer at "expected" rates between patches of serpentine grassland separated by open grassland and chaparral

> Thomas Sisk Dissertation (1992, Stanford University)

Data 2

> Releases near Gilroy in agricultural lands, dispersal to find isolated patch of serpentine, 1/100 butterflies found on patch from 10 km away, higher fractions from closer releases (Harrison 1989)

> Recolonization of Tulare Hill observed in 1995 (went extinct in 1990-1991 during drought) – likely source was North Metcalf "core population"

> Tulare population was ~2500 larvae in 2002 (population recovered), but near extinction as of 2006 (lack of grazing on most of habitat)

Corridor design

> Butterfly is a creature of open grassland

> Low vegetation, simple structure (grassland, row crops) better than trees and urban development

> Open corridors

> Will cross freeways

> Nectar?

Metcalf Canyon Jewelflower