Carlsbad Wildlife Linkage Evaluation and Wildlife Movement Study

Core Team

1. City of Carlsbad
2. Center for Natural Lands Management
3. Environmental Science Associates (ESA)

Other Stakeholders

1. California Department of Fish and Wildlife
2. U.S. Geological Society
3. Preserve Calavera/San Diego Tracking Team
4. Batiquitos Lagoon Foundation

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MHCP Goals

1. Maintain functional wildlife corridors and habitat linkages within the city and to the region.

2. Maintain corridors between each of the major lagoons/estuary systems with larger blocks of inland habitats to allow movement of wildlife species and allow for demographic and genetic exchange.

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Purpose of study

- Assess the use and functionality of linkages and potential barriers to movement so that an adaptive management strategy can be developed to enhance movement within and beyond the MHCP preserve.

- Baseline assessment

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Functional Groups

1. Large animals (**bobcat**, **deer**, coyote) – indicators of functional connectivity (broader movement perspective)

2. Smaller animals (**squirrels**, rabbits, skunks, raccoons) – may provide information about intra-core movement, which is important in a highly fragmented system

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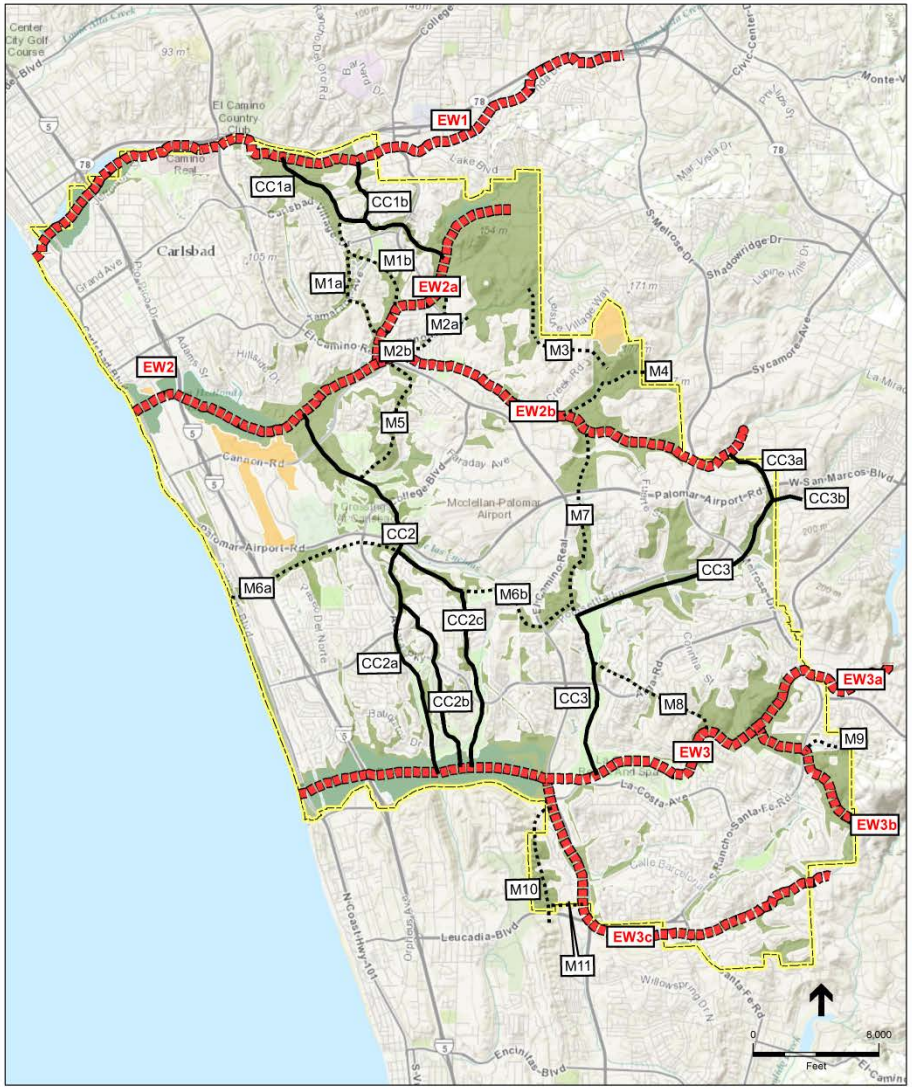
Linkage Focus

1. East-west movement between lagoons and core habitat to east
2. Movement between HMP lands and adjacent core areas (core to core)
3. Movement between smaller fragments of open space



Legend

- [1] Open Space for Preservation of Natural Resources
- [2] Open Space for Managed Production of Resources
- [3] Open Space for Outdoor Recreation
- [4] Open Space for Aesthetic/Cultural/Education

HMP Corridors

- East-West
- Core to Core
- Minor

Figure 1 Corridors
HMP Wildlife Movement

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Strategy

1. Develop a detailed inventory of linkages within the city
2. Identify potential barriers to movements
3. Collect baseline information (presence/absence) at priority pinch point locations using cameras
4. Make recommendations regarding management actions and future study

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Status

- Used similar methods as in USGS MSCP wildlife linkage evaluation study (GIS, satellite imagery, and land use data)
- Identified potential barriers to movement (pinchpoints)
- Visited all identified locations, collected data (CBI, USGS, Crooks, University of Washington), took photos.
- Prioritized pinchpoints and chose 13 locations to install wildlife cameras. These will be monitored for 1 year.

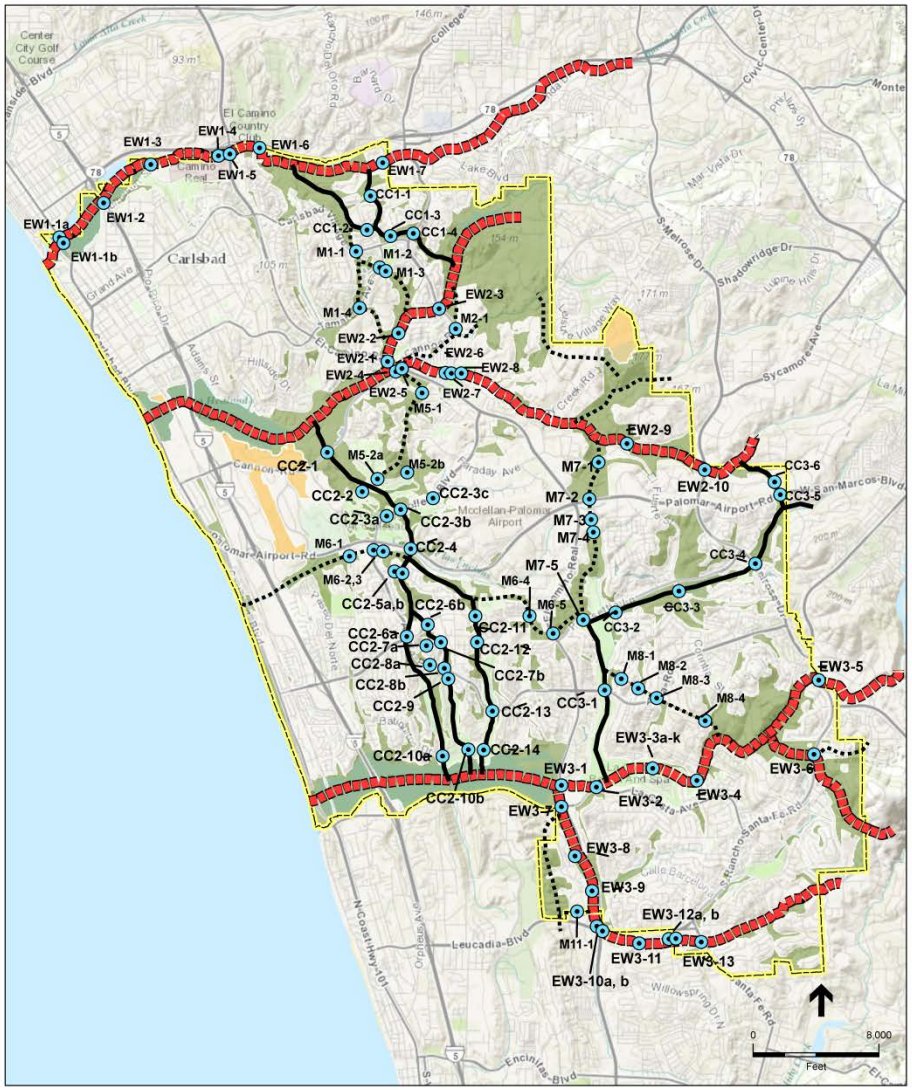

Figure 2 Potential Barriers to Movement

HMP Wildlife Movement

Legend

- [1] Open Space for Preservation of Natural Resources
- [2] Open Space for Managed Production of Resources
- [3] Open Space for Outdoor Recreation
- [4] Open Space for Aesthetic/Cultural/Education

HMPLinkages

- East-West
- Core to Core
- Minor

Points

- Potential Constraints

Pre-field work evaluation, showing location of culverts and fencing.

EW2-4 and EW2-5, High Priority. Agua Hedionda Creek and Cannon/AHC and El Camino Real. Movement along riparian area from AH Ecological Reserve (west side of Cannon/El Camino Real intersection) along creek to the east.

Pinchpoint Inventory

HMP Wildlife Movement Pinchpoint Description

LOCATION DESCRIPTION

Corridor	EW2	**Point Code:**	EW2-4	**Assessment Date**	8/13/2013
Surveyors:	R. Humphrey, J. Henry, ESA				
Latitude:	33.14888727700	**Longitude:**	-117.29788174800	**GPS Datum:**	WGS 84
Nearest River:	Agua Hedionda Creek				
Nearest Road	Cannon Road	**Road Conditions:**	near very busy intersection		
Structure Type:	bridge	**Multi Chambers?**	2 rows	**Structure Material**	concrete
Bottom Type:	sand, dirt, mud, rip-rap, water, debris				
Height(ft):		**Width (ft):**	38.30	**Length (ft):**	30.20
Openness Ratio:	0.0	**Constraints**	potential		
Description of Constraints	may flood during wet season				
Access Logistics	fairly easy access, but lots of human visitation				
Fencing:	W entrance -chainlink, no gaps; E entrance - south side concrete wall; small gap near bridge (11 m); north side n				
Camera Options:	excellent for camera; careful about seasonal flooding and heavy human use				
Tracking Potential	yes				
Species/Sign Observed:	coyote, raccoon, skunk, deer, rodent, lizard				
	woodrat nest nearby				

DESCRIPTION OF VEGETATION EW2-4

N or E Entrance	**Veg. Thickness**	blocked	**Dominant Vegetation Type**	trees	
Cover Classes at 20	**Shrubs**	1 (1-5%)	**Grass/Herbs**	1 (1-5%)	**Trees:** 5 (76-100%)
	Bare/Rock:	1 (1-5%)	**Native Species:**	5 (76-100%)	**Exotic Species** 1 (1-5%)
S or W Entranc	**Veg. Thickness**	moderately blocked	**Dominant Vegetation Typ**	trees	
Cover Classes at 20	**Shrubs**	1 (1-5%)	**Grass/Herb**	3 (26-50%)	**Trees:** 5 (76-100%)
	Bare/Rock:	1 (1-5%)	**Native Species:**	5 (76-100%)	**Exotic Species** 2 (6-25%)
Veg. Comments:					

THREATS AND MANAGEMENT RECOMMENDATIONS EW2-4

Primary Threat:	high human use	**Severity**	4 (severe/imminent)
Secondary Threat:	busy roadway	**Severity**	4 (severe/imminent)
Mgmt Recommendations	cose gaps in fencing		
Comments:	MHCP Monitoring Priority		