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Riparian Bird Community and Habitat Responses to 2007 Wildfires: Preliminary Results

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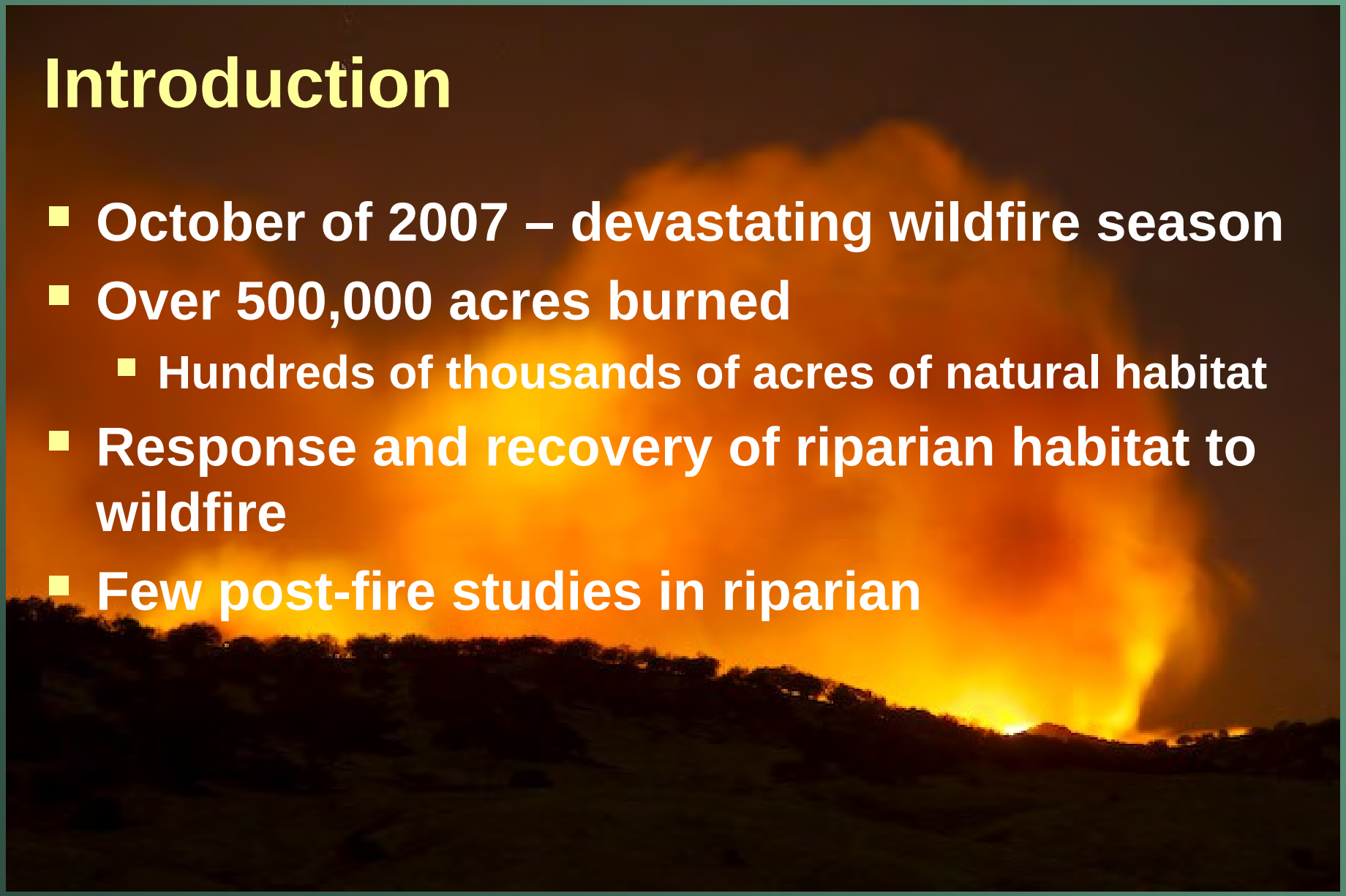
U.S. Department of the Interior
U.S. Geological Survey

Introduction

- October of 2007 – devastating wildfire season
- Over 500,000 acres burned
  - Hundreds of thousands of acres of natural habitat
- Response and recovery of riparian habitat to wildfire
- Few post-fire studies in riparian



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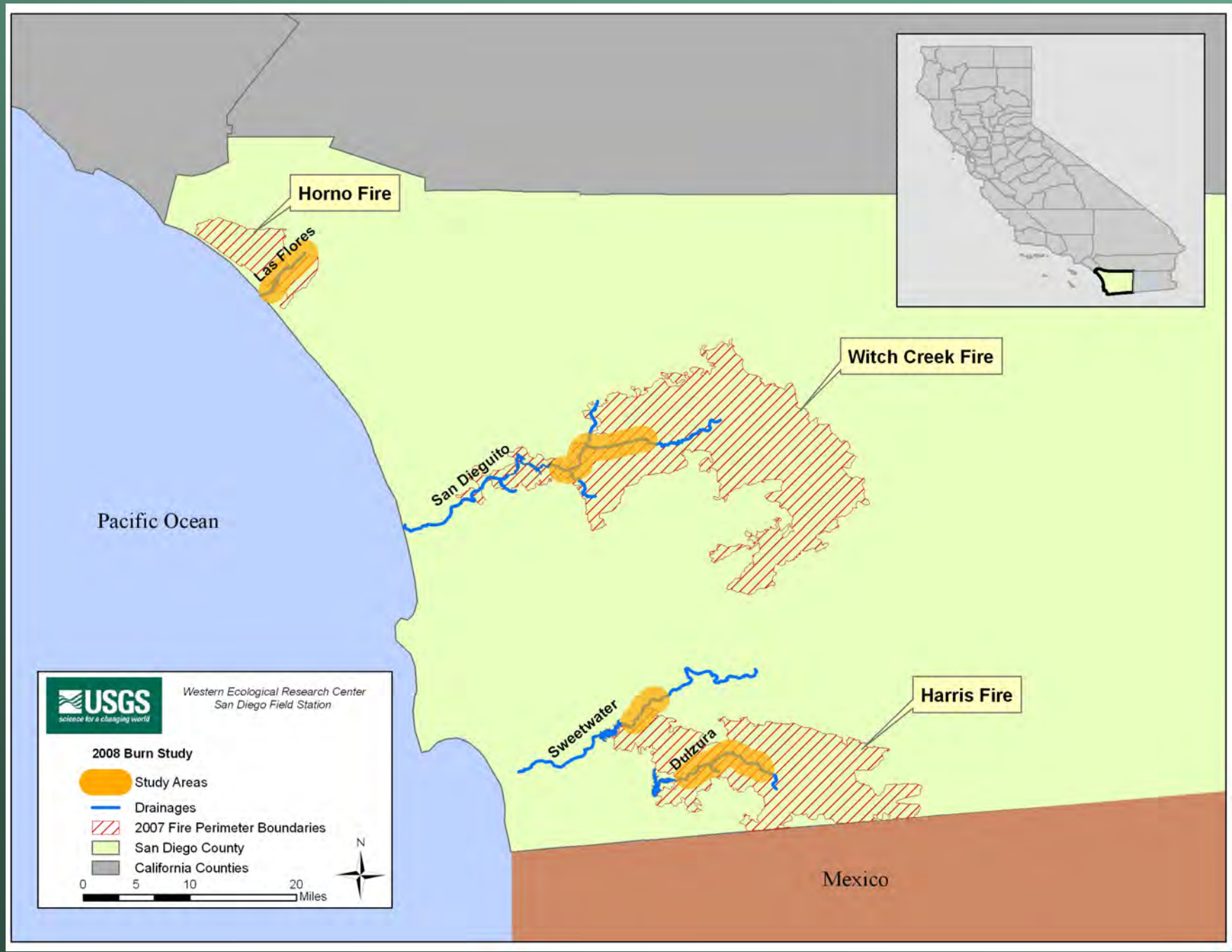
Horno Fire
Las Flores
Witch Creek Fire
San Dieguito
Pacific Ocean
Harris Fire
Sweetwater
Dulzura
Mexico
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Western Ecological Research Center
San Diego Field Station
2008 Burn Study
Study Areas
Drainages
2007 Fire Perimeter Boundaries
San Diego County
California Counties
N
0 5 10 20
Miles

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Las Flores Creek –
Horno Fire, Winter 2007

Goals

- Monitor bird species composition and abundance over time
- Assess the effects of burn severity on bird and vegetation species composition
- Monitor Least Bell's Vireo population over time

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Burn Severity

- Burn severity is the degree of environmental change caused by fire
- Heterogeneity on the landscape influences the distribution of plants and animals

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Study Design

- Three wildfire sites and one reference site
  - Avian point count stations
  - Vegetation transects
  - Least Bell's Vireo surveys

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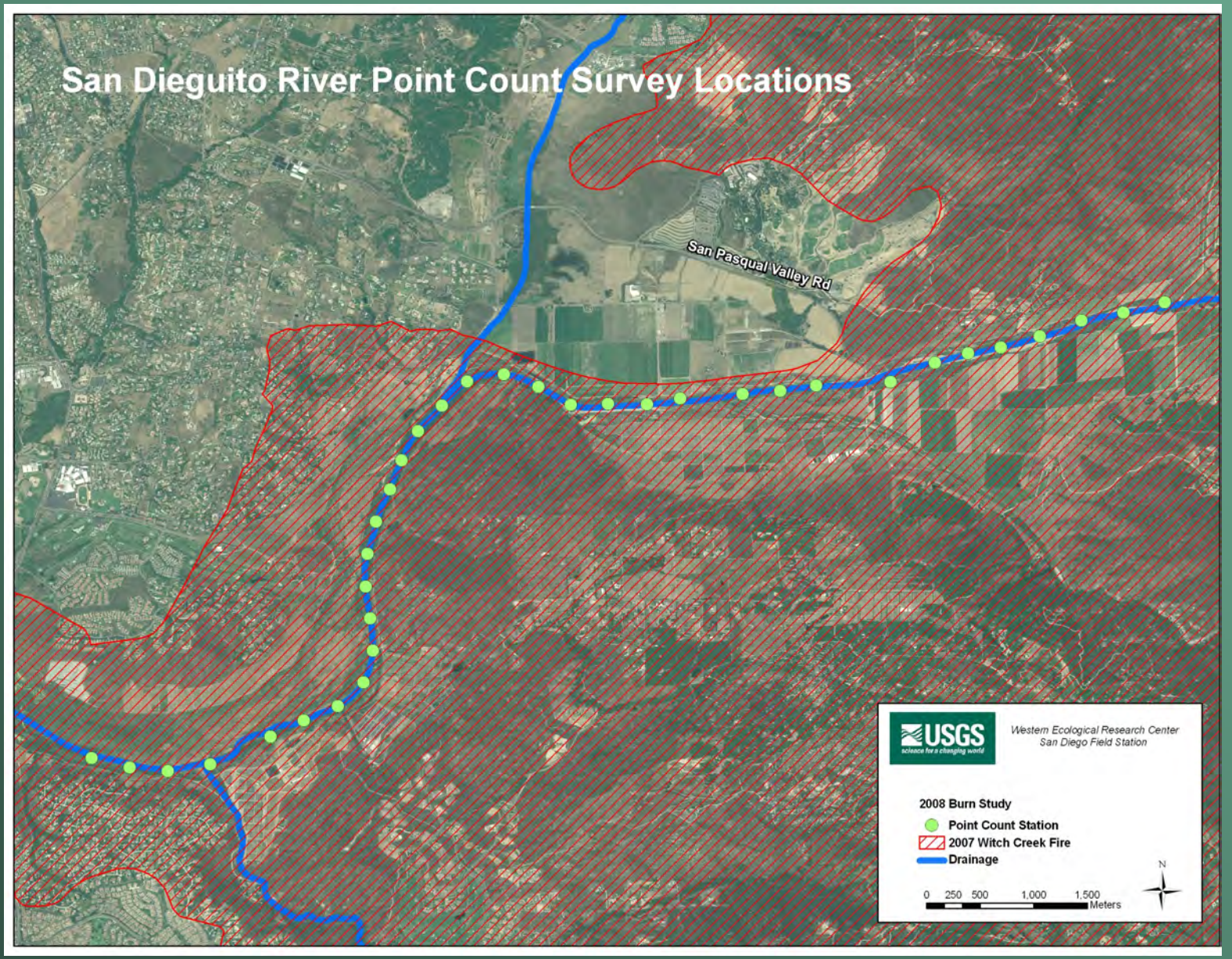
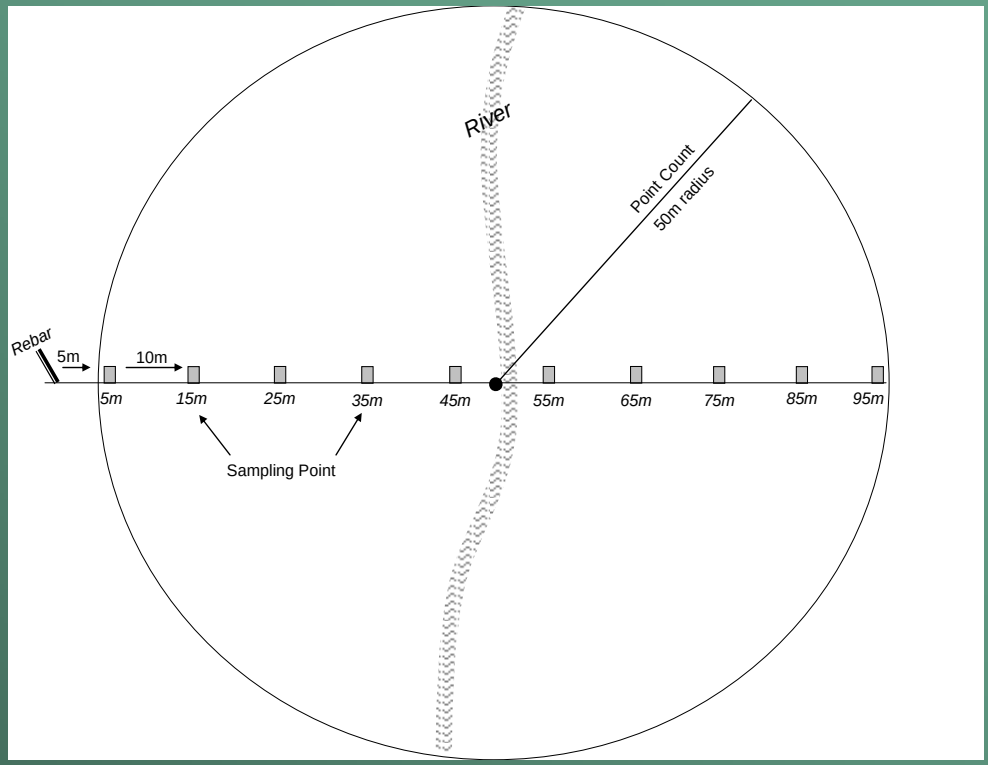


Point Count Stations: N=40
Vegetation Transects: N=32

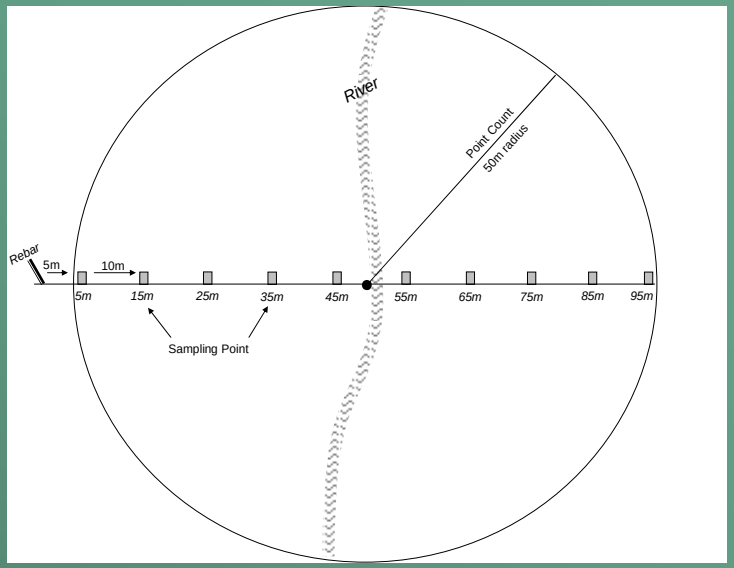
Point Counts

- 50 m radius
- Sampled twice during the breeding season
- Two observers
- 10-minute point counts



Vegetation Transects

- One vegetation transect/point count station
- Sampling unit (Quadrat) = 2x2x1 m cube
- Recorded:
  - Canopy height
  - Percent cover of vegetation, by species
  - Burn Severity Index (BSI)



Burn Severity Index (BSI)

Burn Severity	Rank	Description
Unburned	0	Not burned during 2007 wildfires.
Low	1	Herbaceous layer burned or singed.
Moderate	2	Herbaceous layer completely removed. Trees and shrubs partially burned.
High	3	Trees, shrubs, and herbaceous layer completely scorched.

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Burn Severity

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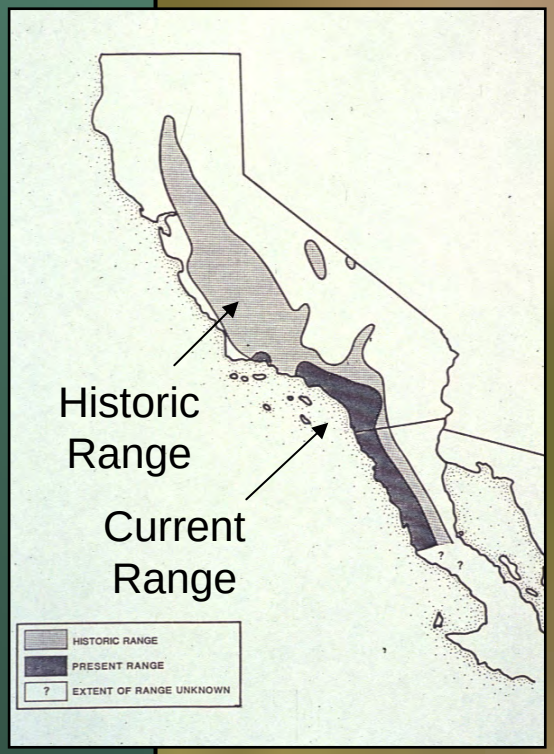
Least Bell's Vireo (*Vireo bellii pusillus*)



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Results

- Monitor bird species composition and abundance over time
- Effect of burn severity on bird and vegetation species composition
- Monitor Least Bell's Vireo population over time

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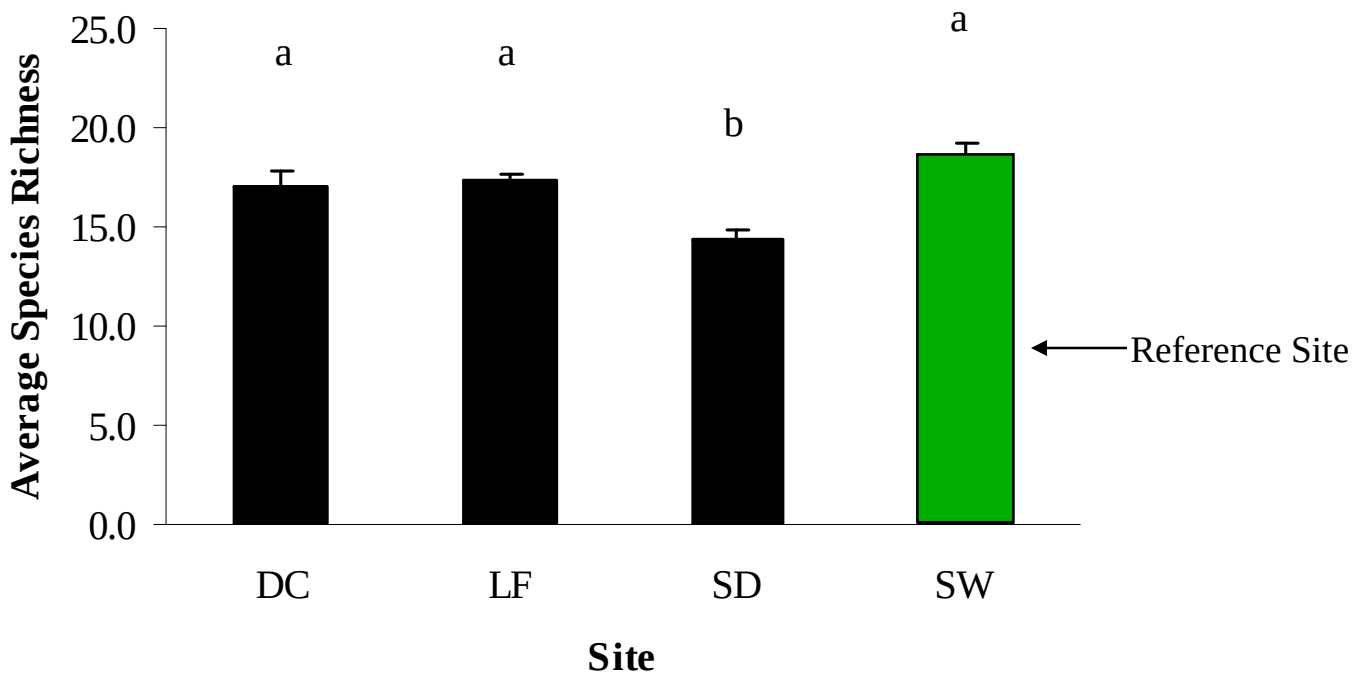
Species Richness by Site - 2008



Results

- Monitor bird species composition and abundance over time
- **Effect of burn severity on bird and vegetation species composition**
- Monitor Least Bell's Vireo population over time

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Burn Severity by Site

(proportion of quadrats)

Site	Unburned	Low	Moderate	High
Dulzura Creek	1%	6%	50%	43%
Las Flores Creek	20%	7%	29%	43%
San Dieguito River	0%	1%	21%	78%

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Vegetation Composition and Burn Severity

- Overall foliage cover ↑ with decreasing burn severity
- Tree and shrub cover at middle and upper canopy height classes ↑ with decreasing burn severity
- Herbaceous cover was higher at moderate burn severity transects

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Exotic Cover and Burn Severity – no consistent patterns

- San Dieguito River had the highest proportion of exotic cover
  - *Arundo donax* and tamarisk – highest at high burn transects
- Dulzura Creek
  - *Arundo donax* was higher at low burn transects
- Las Flores Creek
  - Herbaceous species was higher at unburned, low, and moderate transects compared to high burn transects

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San Dieguito River 2008


San Dieguito River 2008


San Dieguito River 2008


Dulzura Creek 2008


Dulzura Creek 2008


Las Flores Creek 2008

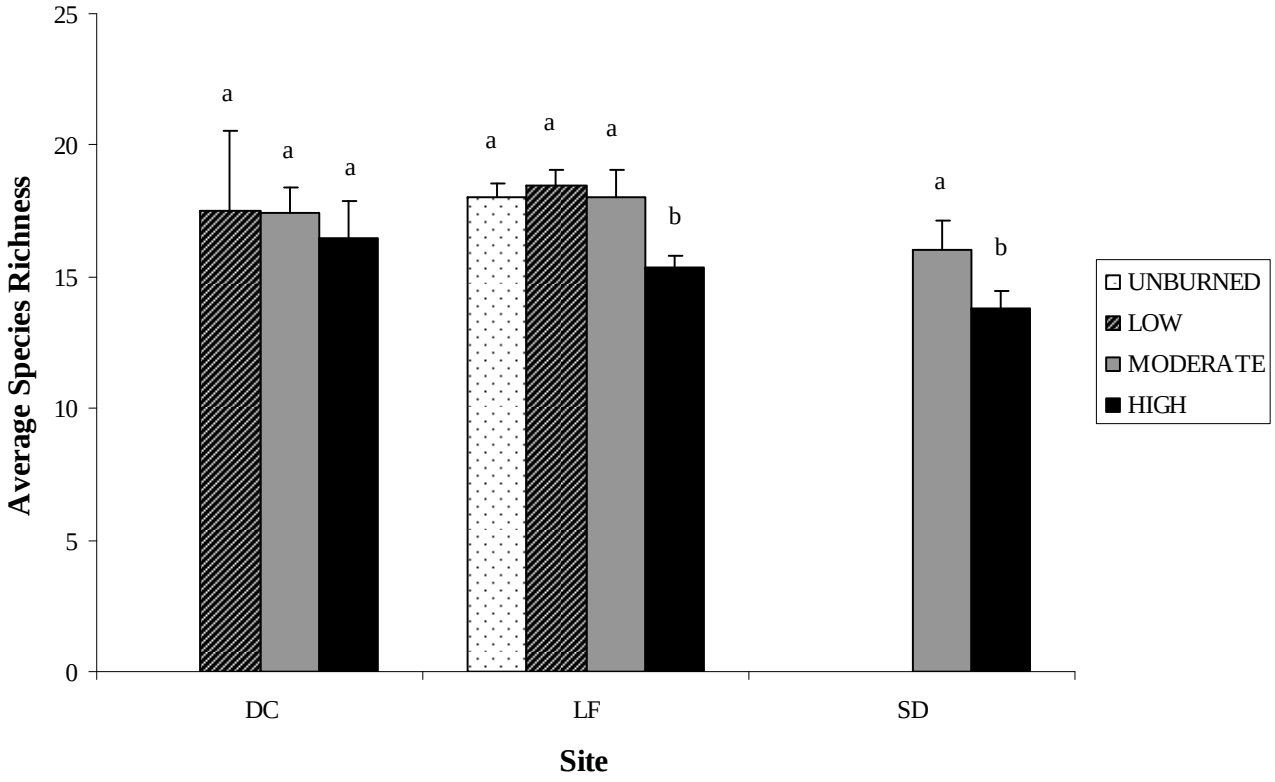

Las Flores Creek 2008


Las Flores Creek 2008


Las Flores Creek 2008

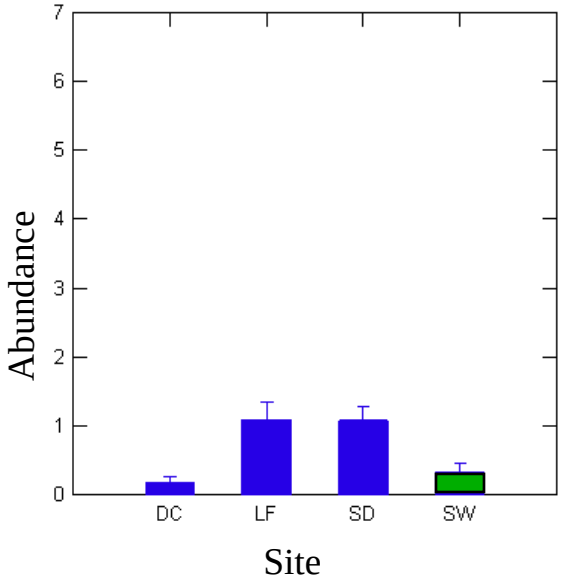
Bird Species Composition

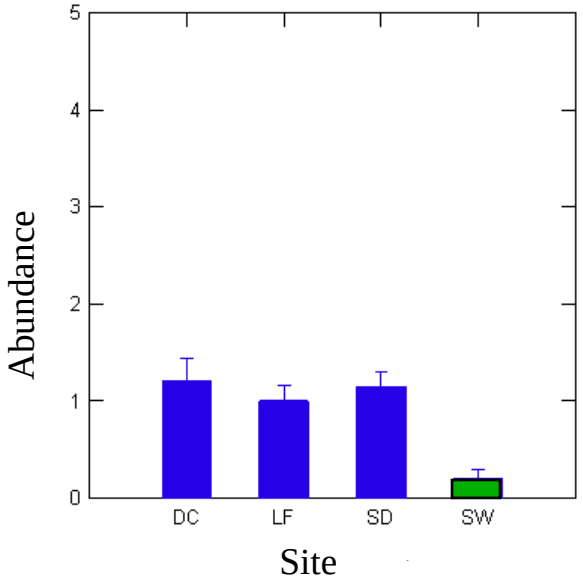
– Species Richness by Burn Severity and Site

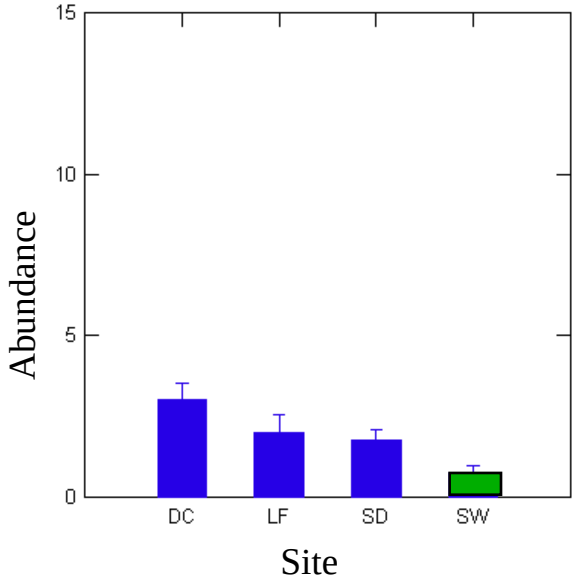


Positive Response Species:

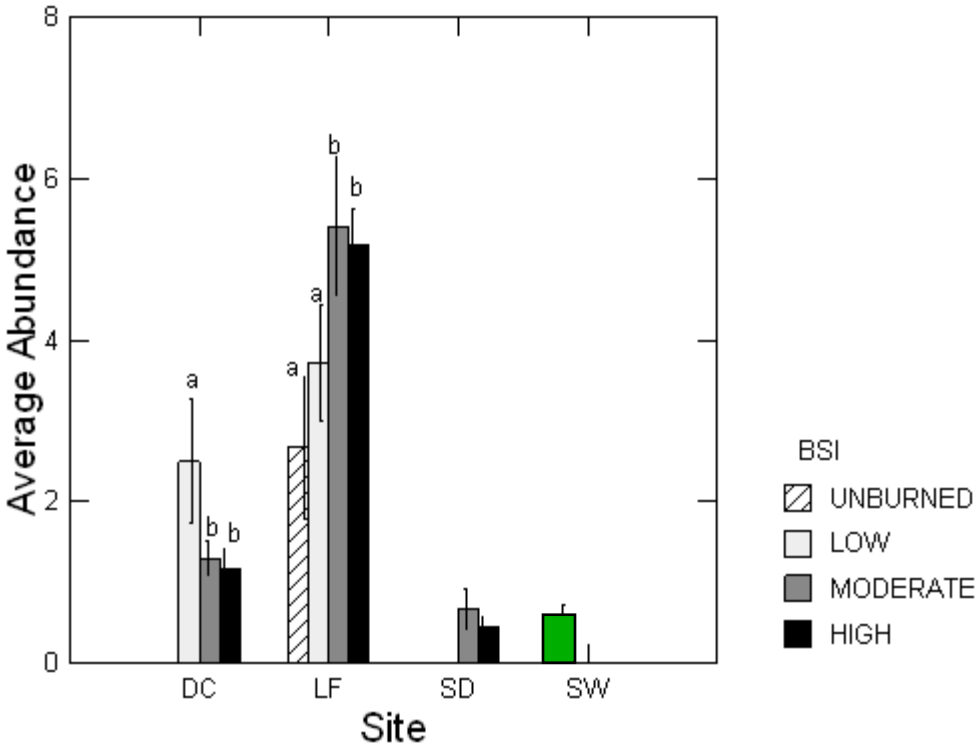
American Goldfinch, Blue Grosbeak, and House Finch





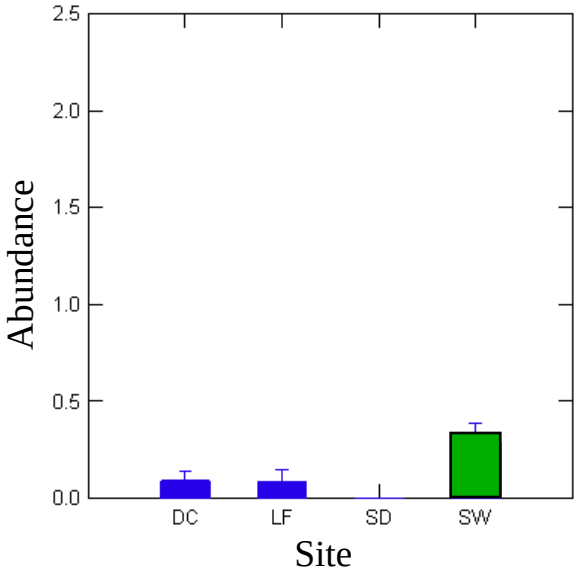


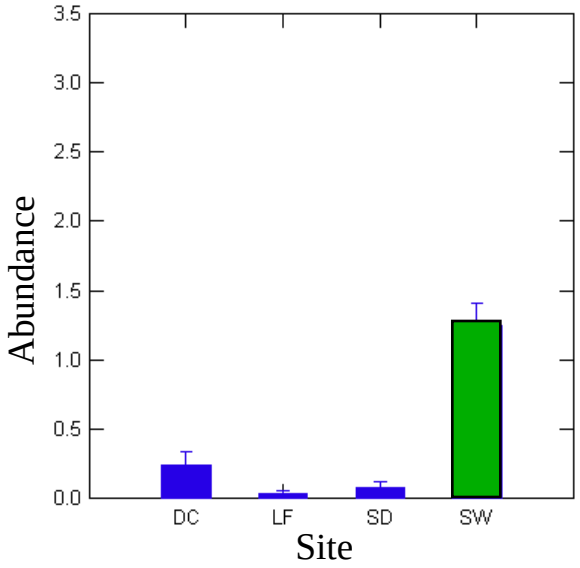
Positive Response - Lazuli Bunting

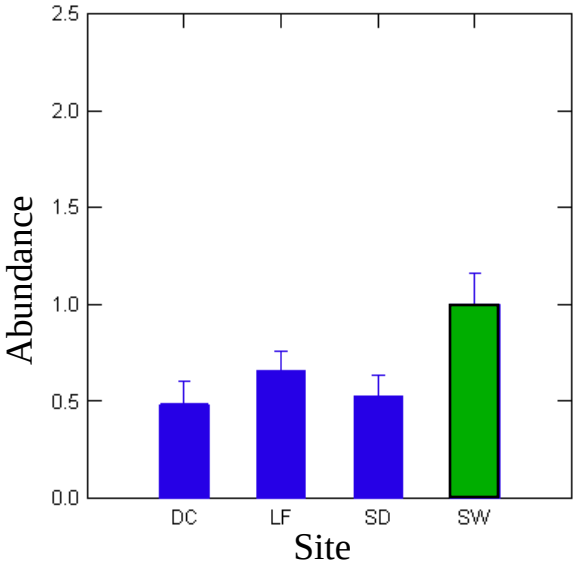


Negative Response Species:

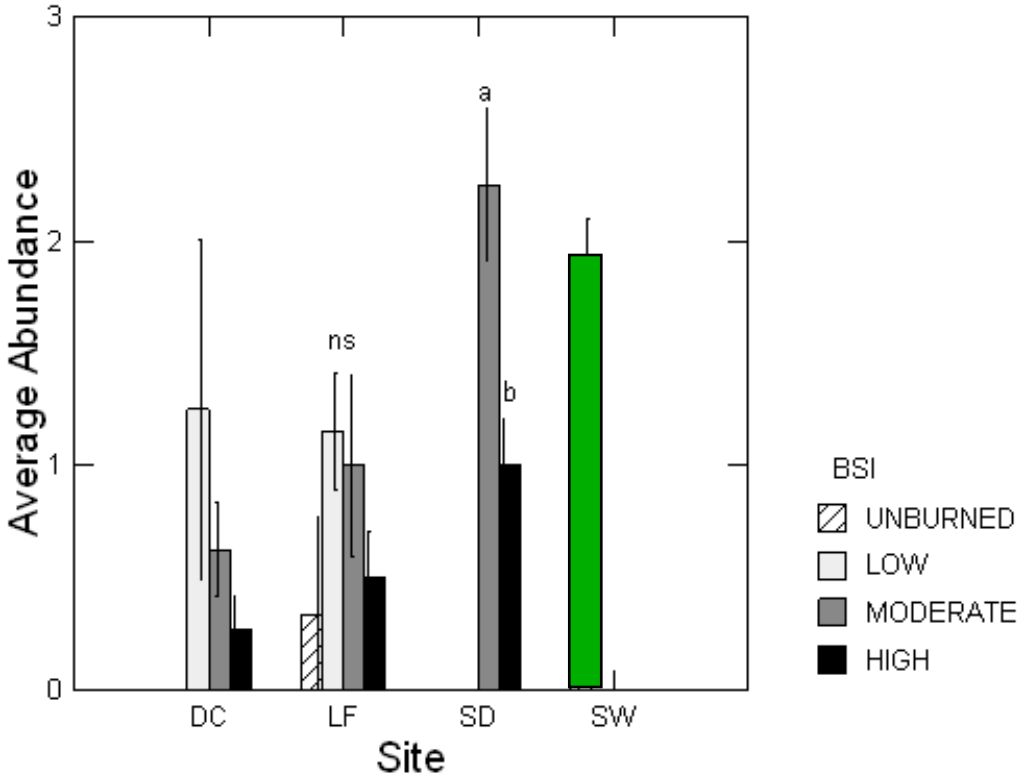
Hutton's Vireo, Pacific-slope Flycatcher, and Nuttall's Woodpecker



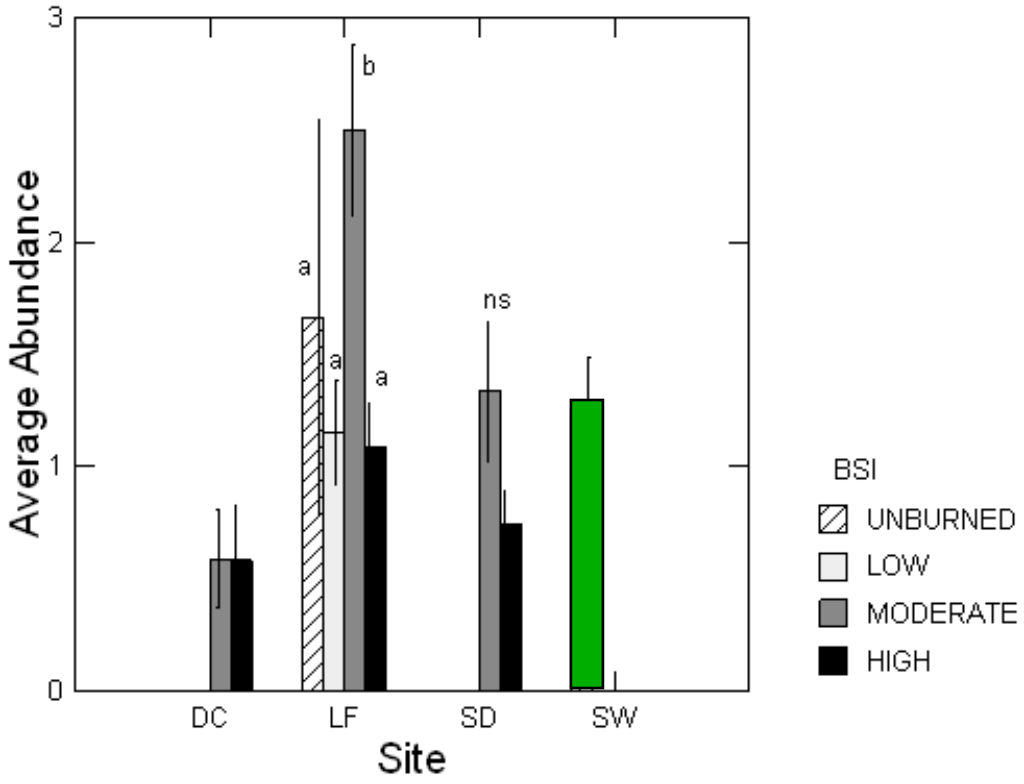




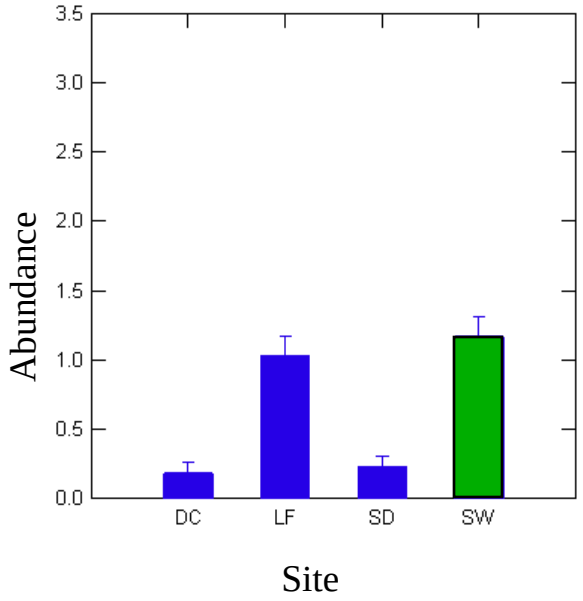
Mixed Response Species: Yellow Warbler

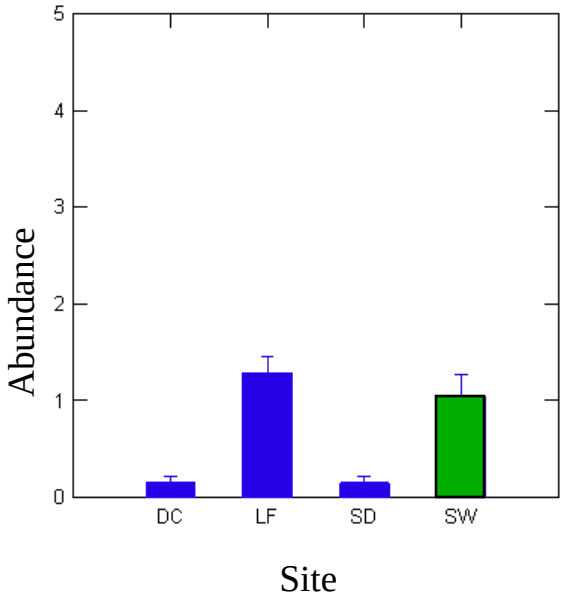


Mixed Response Species: Yellow-breasted Chat



Mixed Response Species: Least Bell's Vireo and Orange-crowned Warbler





Results

- Monitor bird species composition and abundance over time
- Effect of burn severity on bird and vegetation species composition
- **Monitor Least Bell's Vireo population over time**

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Least Bell's Vireo Surveys

	Total Territories	
Survey Site	**2008**	**2009**
Dulzura Creek	12	8
Las Flores Creek	55	88
San Dieguito River	21	32
Sweetwater River	37	31

Reference Site →

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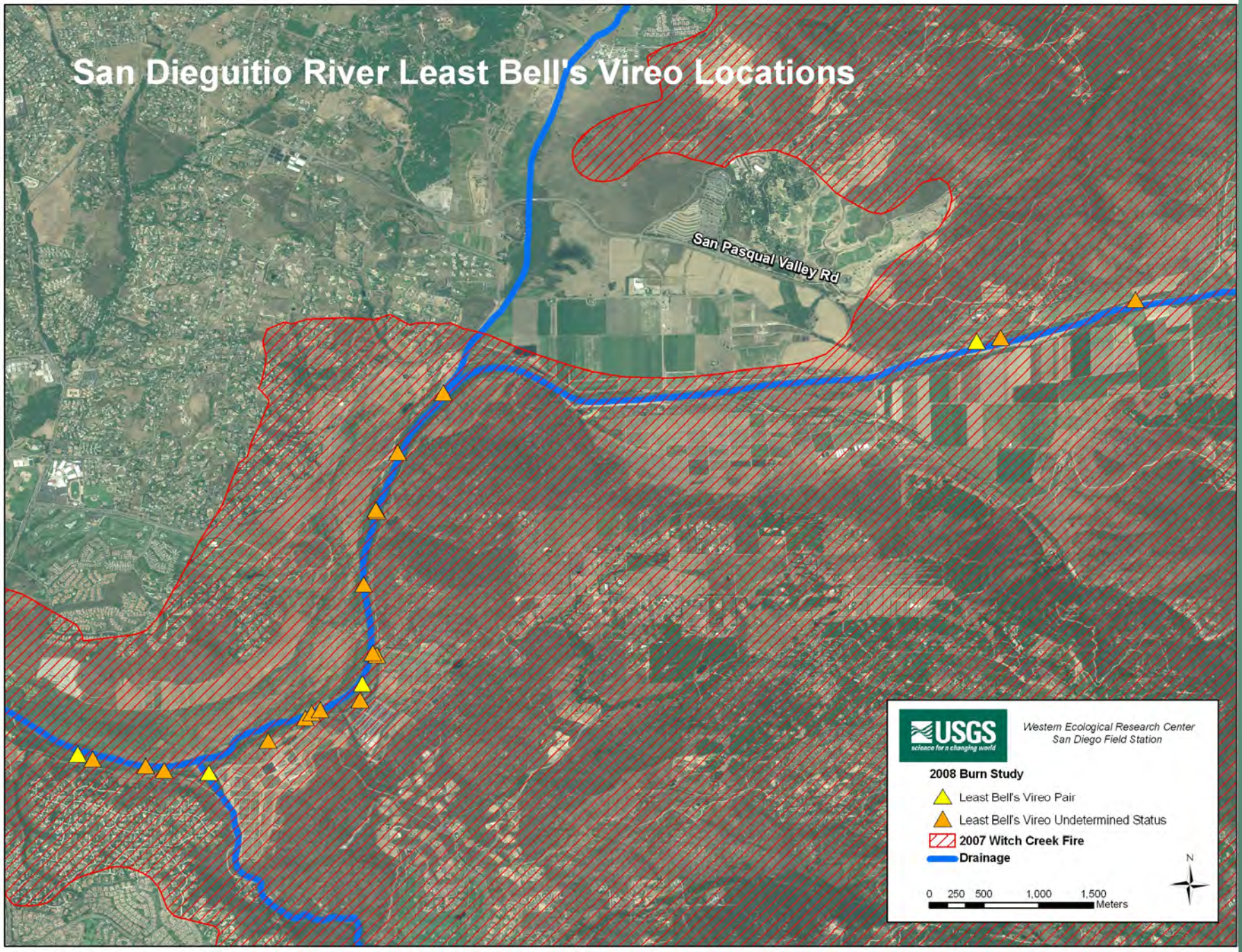
San Dieguitio River Least Bell's Vireo Locations
San Pasqual Valley Rd
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Western Ecological Research Center
San Diego Field Station
2008 Burn Study
Least Bell's Vireo Pair
Least Bell's Vireo Undetermined Status
2007 Witch Creek Fire
Drainage
N
0 250 500 1,000 1,500
Meters

Future Analyses

- Bird-habitat models
- Estimate detectability functions and densities using Program Distance
- Evaluate burn severity using vegetation data

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Habitat Recovery

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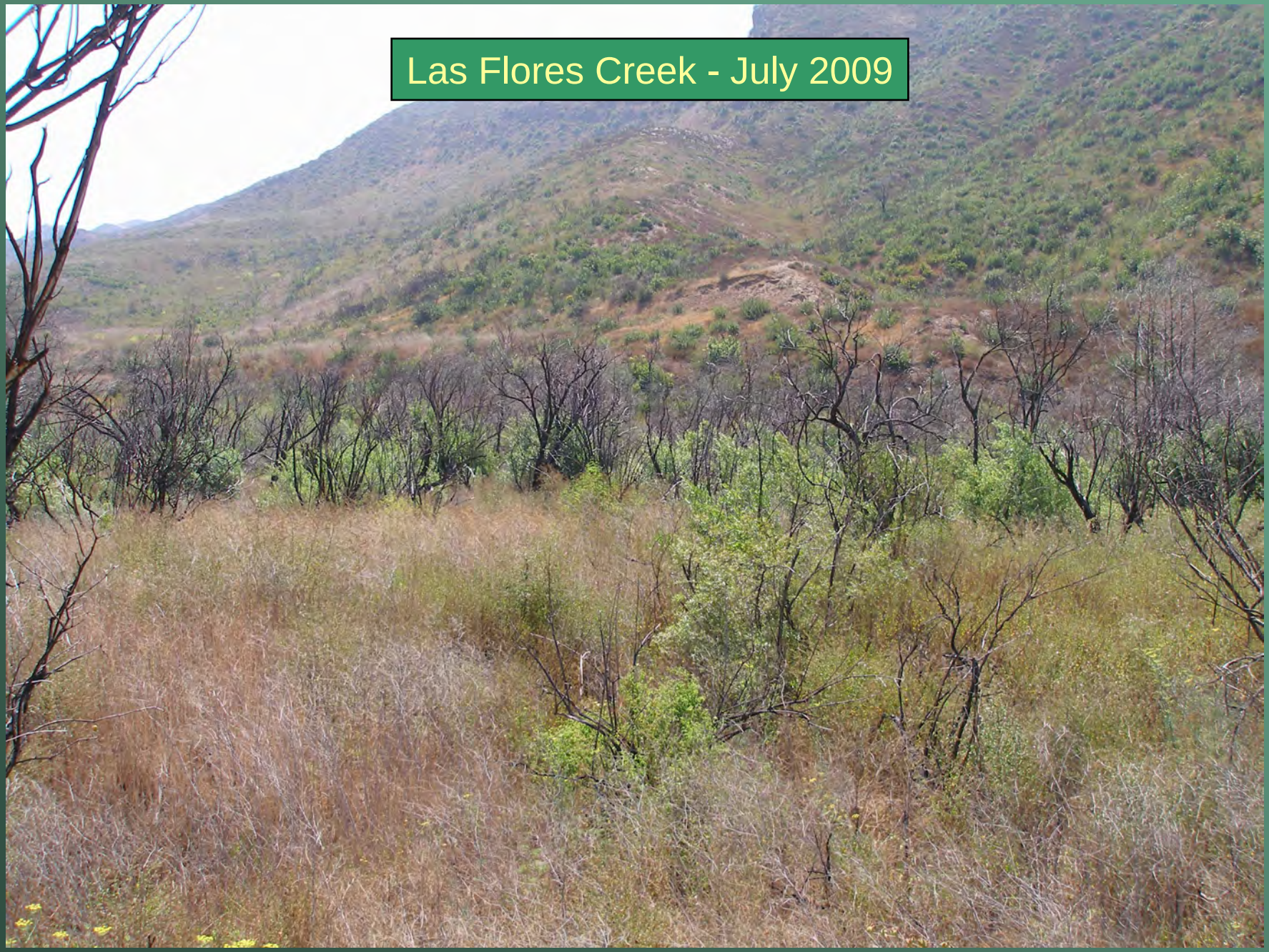
Vegetation Data Collection - 2009


Las Flores Creek - April 2008


Las Flores Creek - April 2008


Las Flores Creek - April 2008


Las Flores Creek - July 2009


Las Flores Creek - July 2009


Las Flores Creek - July 2009


San Dieguito River - August 2008


San Dieguito River - August 2008


San Dieguito River - July 2009

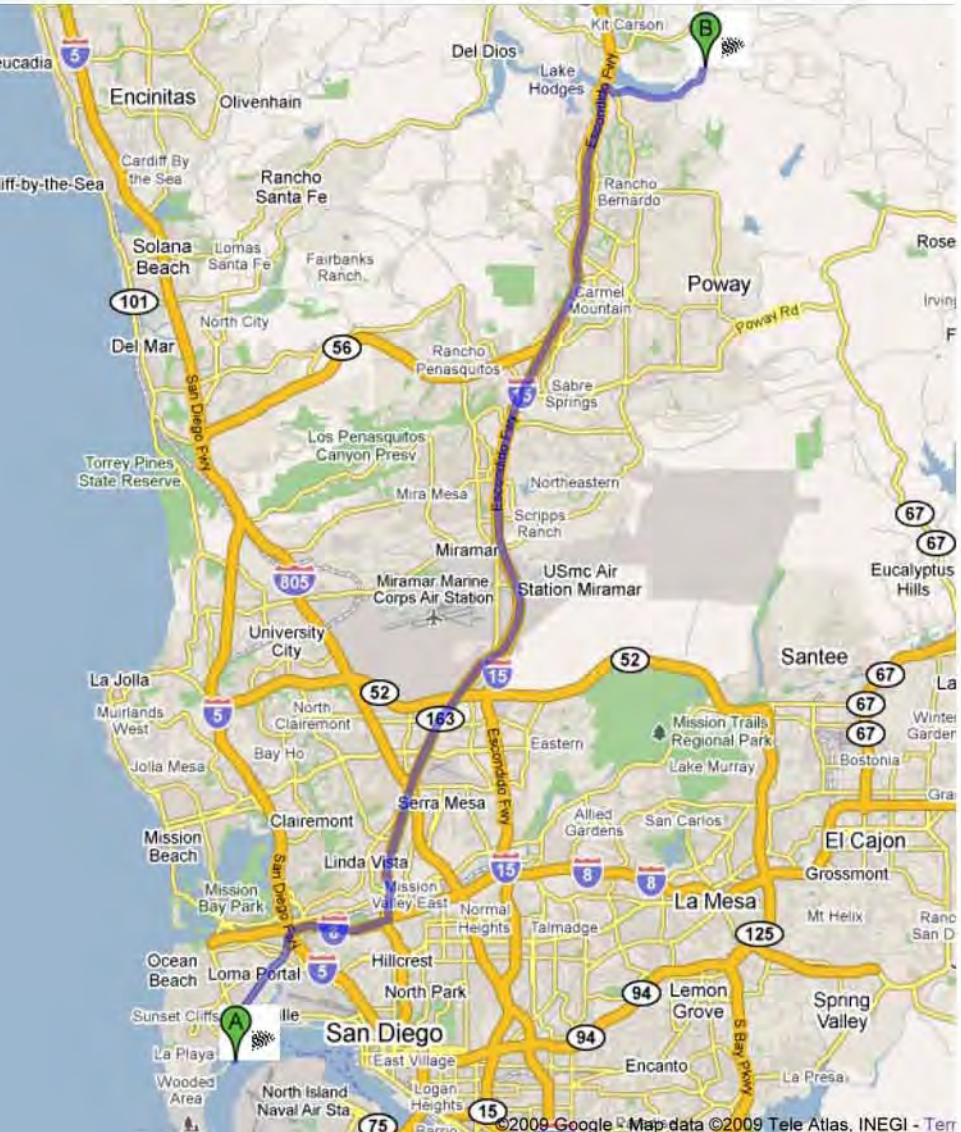

San Dieguito River - July 2009


San Dieguito River - July 2009
Nuttall’s Woodpecker foraging on dead willow

Desert Managers Group 2009 Meeting Field Trip Directions

Directions from Island Palms Hotel on Shelter Island to field trip first meeting place along Highland Valley Rd.

We will be meeting along Highland Valley Rd at a pull off on the left side of the road where the road takes a sharp 90° right bend at the following GPS location 33.06207, -117.02999.



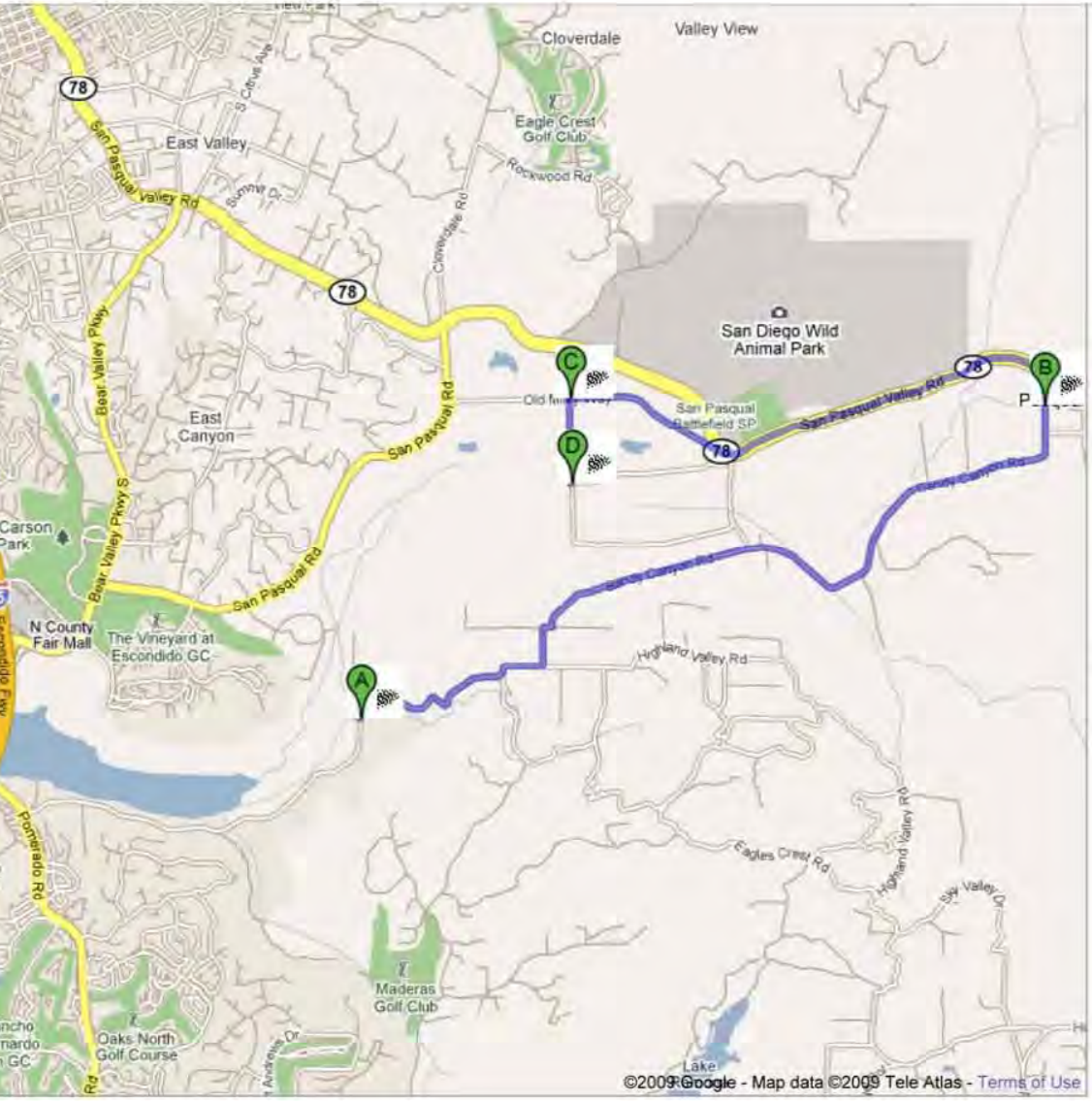
2051 Shelter Island Dr, San Diego, CA 92106

	1. Head **northeast** on **Shelter Island Dr** About 1 min	go 0.4 mi total 0.4 m
	2. At the traffic circle, take the **2nd** exit and stay on **Shelter Island Dr** About 2 mins	go 0.7 mi total 1.0 m
↱	3. Turn **right** at **Rosecrans St** About 6 mins	go 2.5 mi total 3.6 m
	4. Continue on **Camino del Rio W** About 1 min	go 0.4 mi total 3.9 m
8	5. Merge onto **I-8 E** via the ramp to **El Centro** About 3 mins	go 2.4 mi total 6.3 m
↗	6. Take exit **4C** for **CA-163** toward **Escondido** About 1 min	go 0.8 mi total 7.1 m
163	7. Slight **right** at **CA-163 N** About 7 mins	go 7.4 mi total 14.5
15	8. Merge onto **I-15 N** About 12 mins	go 13.5 mi total 28.0
↗	9. Take the **Pomerado Rd** exit toward **W Bernardo Dr** About 1 min	go 0.5 mi total 28.4
↱	10. Turn **right** at **Pomerado Rd** (signs for **Highland Valley Rd/Pomerado Rd**) About 1 min	go 0.2 mi total 28.7
↰	11. Turn **left** at **Highland Valley Rd** Destination will be on the left About 7 mins	go 2.6 mi total 31.3

Highland Valley Rd

Desert Managers Group 2009 Meeting Field Trip Directions

Map shows locations of the three stops along the field trip. We will be stopping at the A, B, and near the D markers on the map.



A Highland Valley Rd

1. Head north on Highland Valley Rd toward Old Coach Way — go 1.4
   About 3 mins — total 1
2. Turn left at Bandy Canyon Rd — go 0.3
   About 1 min — total 1
3. Turn left to stay on Bandy Canyon Rd — go 4.1
   About 10 mins — total 5

Total: 5.8 mi – about

B Bandy Canyon Rd — total 0.0

4. Head north on Bandy Canyon Rd toward CA-78/San Pasqual Valley Rd — go 0.1
   total 0
5. Turn left at CA-78/San Pasqual Valley Rd — go 2.3
   About 4 mins — total 2
6. Slight left at Old Milky Way — go 1.1
   About 3 mins — total 3

Total: 3.5 mi – about

C Old Milky Way — total 0.0

7. Head south toward Ysabel Creek Rd — go 0.5
   Destination will be on the right — total 0
   About 1 min

Total: 0.5 mi – abo

D Unknown road

A) First stop of the field trip after leaving the Island Palms Hotel. This is the same location as the B marker on the map found on the other side. (33.06207, -117.02999)
B) Second stop is in a parking lot on the left, right before highway 78. (33.09216, -116.95546)
C) This is the entrance of the Sod Farm were the last stop is located. (33.09086, -117.00711)
D) From this spot take a right down the field road for the last stop, about 0.7 mile. (33.08550, -117.0178


San Dieguito River - July 2009
Cooper's Hawk