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# Monitoring potential Off-Highway Vehicle impacts on Sonoran Desert wash-woodland communities

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**and Daniel Steward**

**PRBO Conservation Science**

**and the California BLM**

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California BLM Needles FO

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California BLM El Centro FO

Arizona BLM Lake Havasu City FO

Havasu National Wildlife Refuge


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## What's a Wash?

- Drains the landscape
- Ephemeral above-surface flow (xeroriparian)
- High water table
- High soil nutrient content
- Diverse vegetation, both in composition and structure
- Occupies less than 5% of the Colorado Desert,

yet supports 90% of the birdlife found there (Dimmitt 2000)

- California Audubon IBA

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# What's a Wash?

- An effective and popular transportation route for Off-Highway Vehicle recreation

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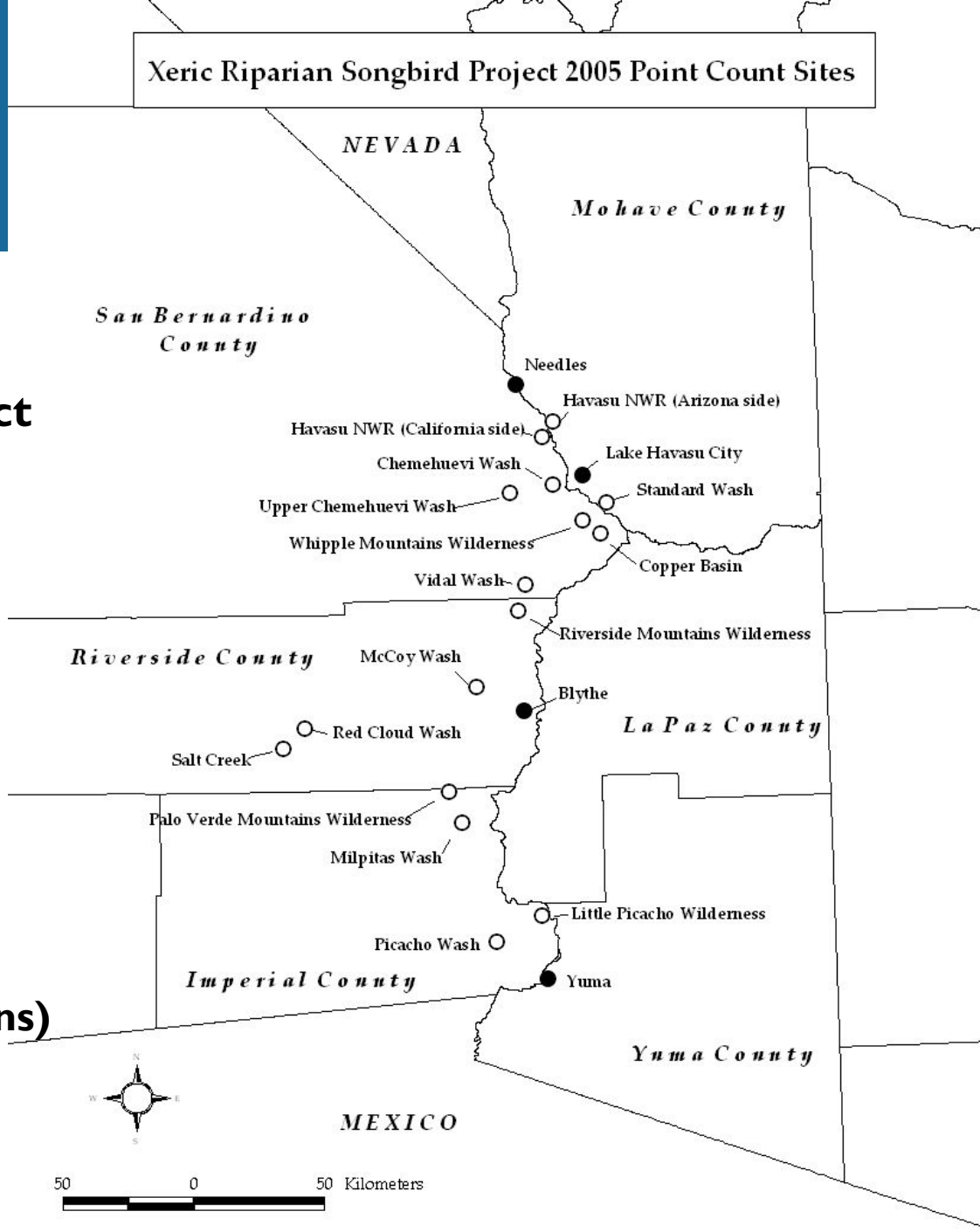
# Xeric Riparian Songbird Project

- 2003-current
- 647 point count stations,
411 surveyed 2004-current
116 surveyed 2003-current

- high-use and low-use nest plots on the Chemehuevi Wash

- vegetation assessments at landscape scale (point count stations) and nest-site scale (nest plots)

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- **Species inventory (146 species, 42 confirmed breeders)**

- **Establish baseline values for nest success, breeding species diversity, breeding species richness and breeding species relative abundance.**

- **Investigate long-term differences in productivity, diversity, and abundance between high-use and low-use sites.**

- **Determine habitat requirements for restoration objectives.**

- **Investigate other potential impacts on xeric riparian bird communities.**


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## Gila Woodpeckers on Milpitas Wash

- At least 4 pair in 2004, 2005, and 2006
- California State Endangered, estimated 200 individuals in CA
- Only well-documented on the Colorado River, and in urban habitats near Brawley

# Gila Woodpeckers on Milpitas Wash

- All 8 nests located in Blue Palo Verde
- Substrates averaged 7.1 m in height, 41 cm at DBH

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## Bendire's Thrashers on Chemehuevi Wash

- CA Species of Special Concern
- PIF Species of Highest Concern

- CA population largely unknown

- Only 7 nests previously found during incubation in California

- 8 nests located 2003-2006 by PRBO

- Chemehuevi Wash perhaps the only known site in CA perennially with breeding pairs (detected each season 2003-2006)

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## Bendire's Thrashers on Chemehuevi Wash

- Nests on edges of woodland corridors, at palo verde/ creosote interface.

- 7/8 nests in Blue Palo Verde, one in Lycium.

- 6/8 nests within 75 m of active Loggerhead Shrike nests, and an additional LOSH nest initiated in an old BETH nest.

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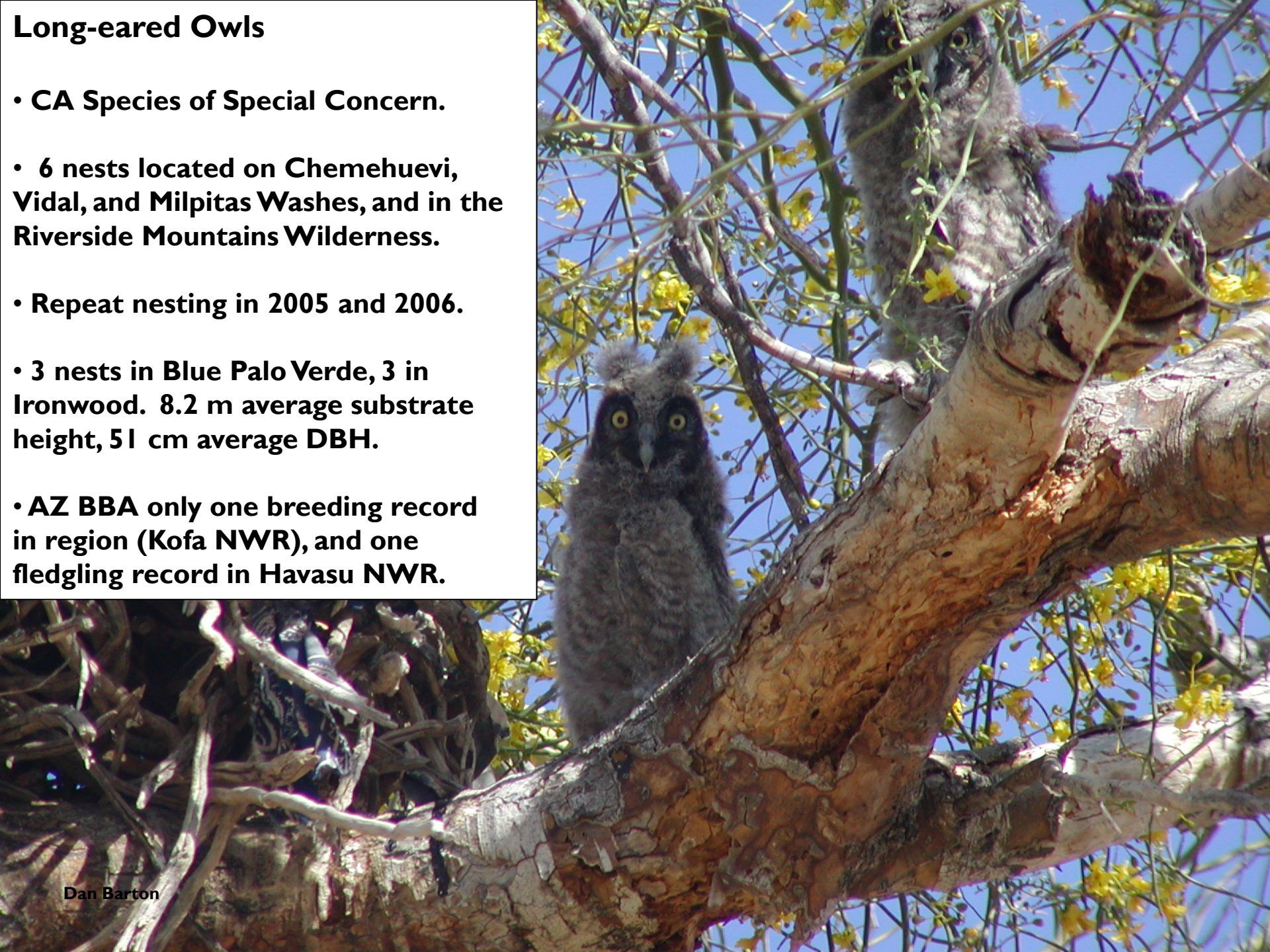
## Bell's Vireos on Chemehuevi Wash

- **California State Endangered**

- **Not previously found to use Sonoran Desert woodland habitats for breeding in California**

# Long-eared Owls

- CA Species of Special Concern.
- 6 nests located on Chemehuevi, Vidal, and Milpitas Washes, and in the Riverside Mountains Wilderness.
- Repeat nesting in 2005 and 2006.
- 3 nests in Blue Palo Verde, 3 in Ironwood. 8.2 m average substrate height, 51 cm average DBH.
- AZ BBA only one breeding record in region (Kofa NWR), and one fledgling record in Havasu NWR.



# PRBO Conservation Science


Robert Shantz


Mike Danzenbaker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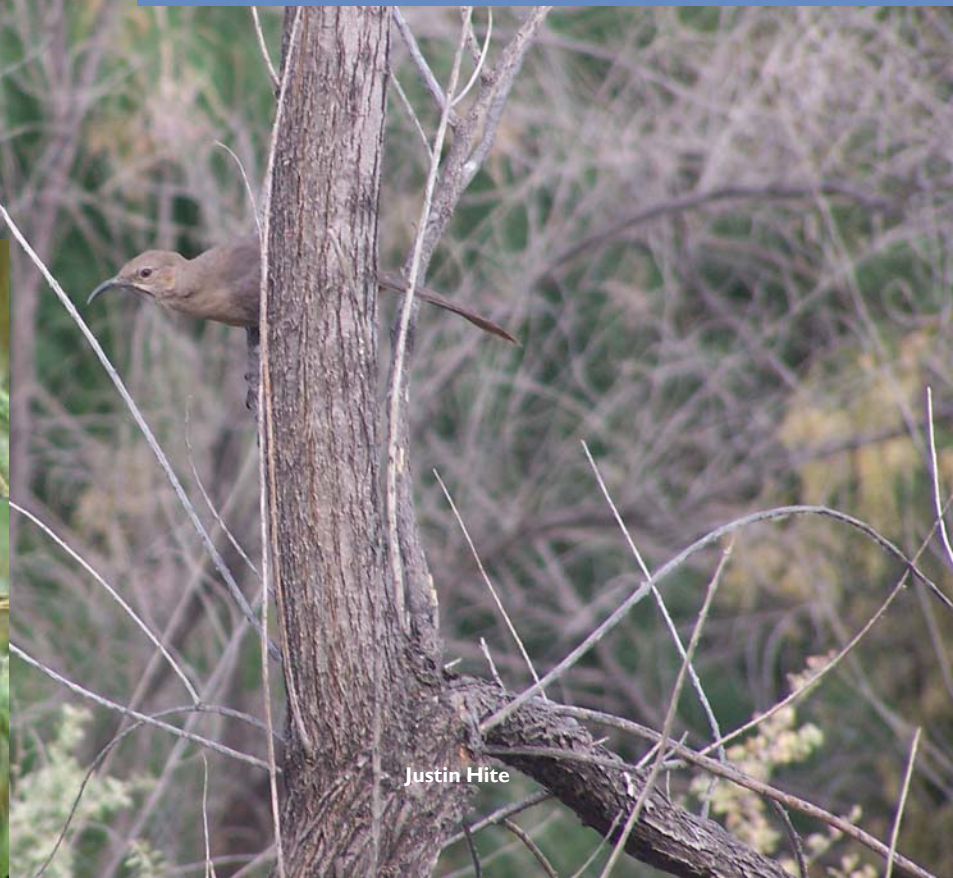
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JH


CM


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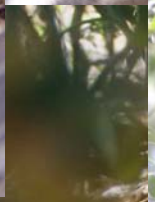
JH


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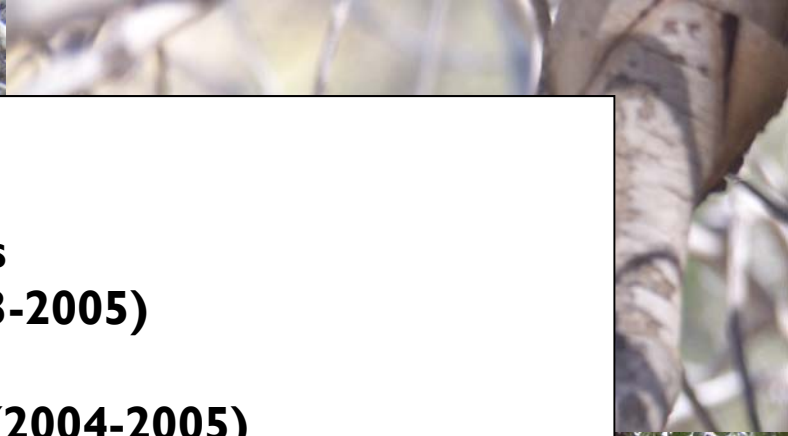
## Nest-site Vegetation Data

- **463 nests located during point count surveys and point count vegetation assessments (2003-2005)**

- **399 monitored nests on Chemehuevi Wash (2004-2005)**

- **Nest vegetation data contributed directly to Desert Bird Conservation Plan and California Species of Special Concern species accounts.**








# Nest substrate frequencies in Xeric Riparian habitats of the Lower Colorado River Valley, 2003-2005 (*n* =463)

| Species | Nests | Blue Palo Verde | Ironwood | Foothills Palo Verde | Smoke tree | Catclaw Acacia | Lycium | Mistletoe | Woodland Species | Average DGH (cm) |
|---|---|---|---|---|---|---|---|---|---|---|
| Phainopepla | 87 | 0.52 | 0.22 | 0.03 | 0.03 | 0.10 | 0.01 | 0.09 | **0.99** | **33.9** |
| Black-tailed Gnatcatcher | 53 | 0.46 | 0.10 | 0.15 | 0.10 | 0 | 0 | 0.15 | **0.98** | **27.2** |
| Ash-throated Flycatcher | 46 | 0.48 | 0.27 | 0.25 | 0 | 0 | 0 | 0 | **1.00** | **48.0** |
| House Finch | 41 | 0.34 | 0.15 | 0 | 0.29 | 0 | 0 | 0.10 | **0.90** | **26.9** |
| Loggerhead Shrike | 39 | 0.67 | 0.15 | 0.05 | 0 | 0 | 0.05 | 0.05 | **0.92** | **24.6** |
| Verdin | 37 | 0.14 | 0.41 | 0.14 | 0.05 | 0.10 | 0 | 0.09 | **0.91** | **41.1** |
| Mourning Dove | 25 | 0.32 | 0.12 | 0.44 | 0 | 0 | 0 | 0 | **0.88** | **25.1** |
| Northern Mockingbird | 20 | 0.10 | 0.05 | 0.30 | 0 | 0.10 | 0.25 | 0.10 | **0.65** | **15.4** |
| Black-throated Sparrow | 19 | 0.05 | 0 | 0.11 | 0.05 | 0 | 0 | 0 | **0.21** | **4.9** |
| Costa's Hummingbird | 16 | 0.69 | 0.06 | 0.13 | 0 | 0 | 0 | 0 | **0.88** | **20.3** |
| Lucy's Warbler | 16 | 0.50 | 0.31 | 0.19 | 0 | 0 | 0 | 0 | **1.00** | **55.6** |
| **ALL NESTS** | **463** | **0.41** | **0.17** | **0.12** | **0.05** | **0.03** | **0.02** | **0.06** | **0.82** | |

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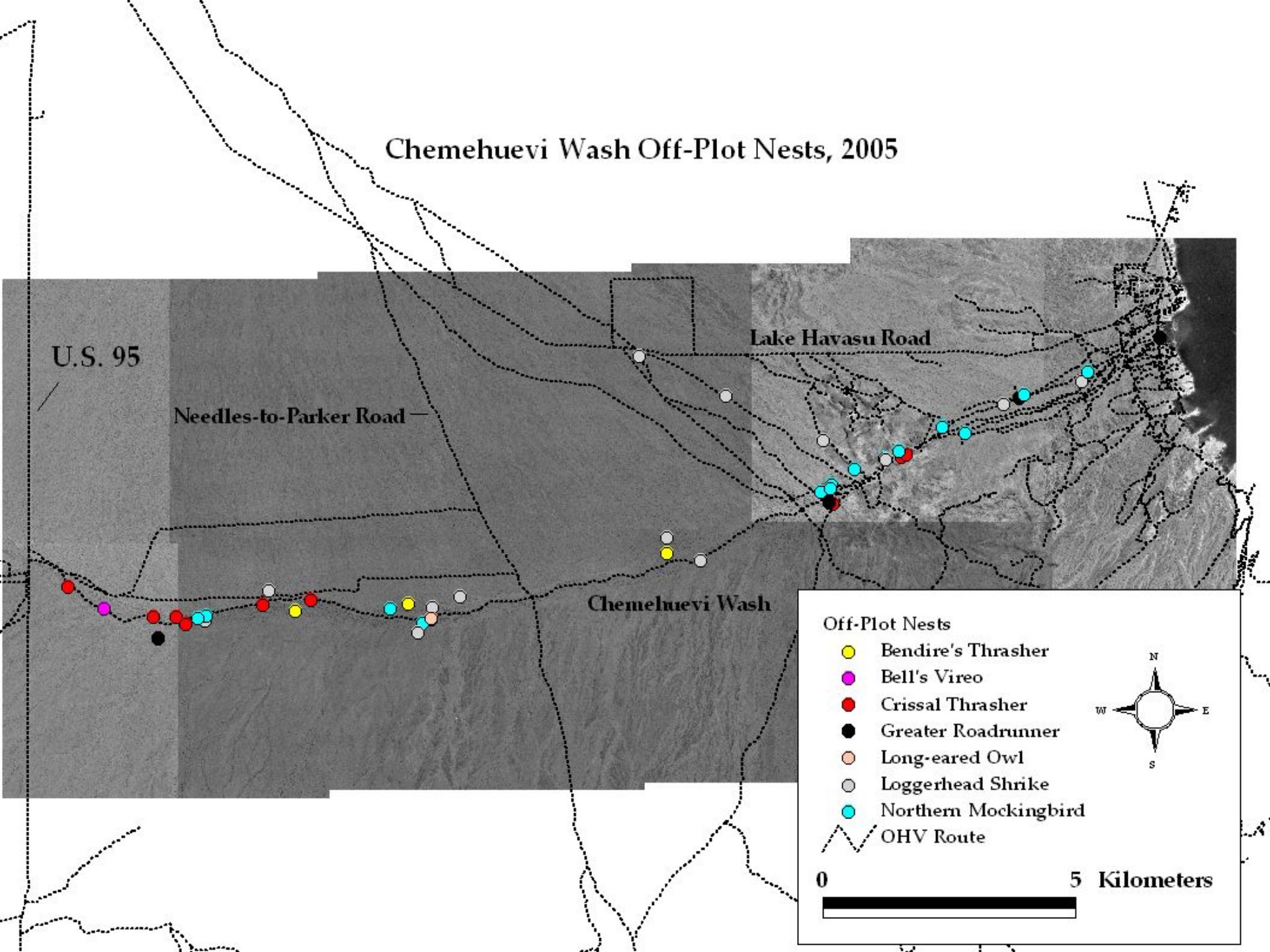
**Table 9. Mayfield estimates of nest success for study species with 10 or more nests at Chemehuevi Wash, 2004-2005 (low-use and high-use plots combined).** Proportional success (Tables 8a and 8b) generally overestimates nest success.

| Species | Number of Nests | Daily Nest Survival | SE | Total Nest Survival |
|---|---|---|---|---|
| Costa's Hummingbird | 14 | 0.98 | 0.01 | **0.48** |
| Ash-throated Flycatcher | 21 | 0.99 | 0.01 | **0.60** |
| Loggerhead Shrike | 16 | 1.00 | 0.00 | **0.87** |
| Verdin | 34 | 0.99 | 0.00 | **0.78** |
| Black-tailed Gnatcatcher | 38 | 0.97 | 0.01 | **0.45** |
| Northern Mockingbird | 14 | 0.99 | 0.01 | **0.68** |
| Crissal Thrasher | 11 | 0.98 | 0.01 | **0.55** |
| Phainopepla | 90 | 0.98 | 0.00 | **0.50** |
| Lucy's Warbler | 15 | 0.98 | 0.01 | **0.54** |
| House Finch | 14 | 0.99 | 0.00 | **0.63** |


Chemehuevi Wash Off-Plot Nests, 2005
U.S. 95
Needles-to-Parker Road
Lake Havasu Road
Chemehuevi Wash
Off-Plot Nests
Bendire's Thrasher
Bell's Vireo
Crissal Thrasher
Greater Roadrunner
Long-eared Owl
Loggerhead Shrike
Northern Mockingbird
OHV Route
N
W
E
S
0
5 Kilometers

# Relative Abundances of Desert Plan Focal Species

| Station | *n* | Verdin | Ash-throated Flycatcher | Phainopepla | Black-tailed Gnatcatcher | Black-throated Sparrow | House Finch | Lucy's Warbler |
|---|---|---|---|---|---|---|---|---|
| Havasu NWR – California | 19 | **0.87** | 0.57 | 0.40 | **0.61** | 0.13 | **0.42** | **0.93** |
| Havasu NWR – Arizona | 15 | 0.43 | 0.59 | 0.03 | 0.37 | 0.32 | 0.18 | 0.18 |
| Upper Chemehuevi Wash | 41 | 0.69 | **0.63** | **0.90** | 0.48 | 0.31 | 0.15 | 0.23 |
| Chemehuevi Wash | 41 | 0.51 | 0.46 | **0.59** | 0.36 | 0.32 | 0.29 | 0.23 |
| Standard Wash | 40 | 0.54 | 0.29 | 0.25 | **0.53** | **0.89** | 0.09 | 0.04 |
| Whipple Mtns. Wilderness | 19 | 0.17 | 0.44 | 0.08 | 0.25 | **0.57** | **0.37** | 0.09 |
| Copper Basin | 22 | 0.58 | 0.58 | 0.07 | **0.55** | **0.65** | 0.32 | **0.27** |
| Vidal Wash | 44 | 0.57 | 0.58 | 0.13 | 0.31 | 0.01 | **0.38** | **0.29** |
| Riverside Mtns. Wilderness | 27 | 0.15 | 0.43 | 0.03 | 0.27 | 0.17 | 0.02 | 0.14 |
| Big Wash | 28 | 0.06 | 0.36 | * | 0.20 | 0 | 0.02 | 0.25 |
| Slaughter Tree Wash | 12 | 0.21 | **0.67** | 0.04 | 0.21 | 0 | 0.25 | **0.29** |
| McCoy Wash | 31 | **0.82** | 0.44 | 0.38 | **0.59** | 0.05 | 0.12 | **0.39** |
| Red Cloud Wash | 24 | **0.77** | 0.42 | 0.13 | 0.44 | **0.90** | **0.65** | 0 |
| Salt Creek | 24 | **0.84** | 0.17 | 0.34 | 0.42 | **0.42** | 0.11 | 0 |
| Palo Verde Mtns. Wilderness | 16 | 0.67 | **0.65** | 0.38 | 0.19 | 0.23 | 0.16 | 0 |
| Milpitas Wash | 90 | **0.80** | **0.65** | **0.86** | 0.42 | 0.03 | 0.32 | 0.13 |
| Picacho Wash | 29 | 0.66 | 0.55 | **0.91** | 0.21 | 0.03 | **0.39** | 0 |
| Unnamed Wash | 28 | 0.45 | **0.66** | 0.16 | 0.07 | * | 0.07 | 0 |
| Little Picacho Wilderness | 12 | 0.71 | 0.54 | **1.19** | **0.54** | 0 | 0.19 | 0.13 |

**In the Lower Colorado River Valley, large, low elevation washes tend to have the highest breeding species diversity, breeding species richness, and relative abundances (with sites on the Havasu NWR on the Colorado River as the exception). These washes also tend to have the highest OHV recreation use. The densest and most diverse Sonoran Desert wash woodland bird communities tend to receive the highest impacts from OHV recreation.**

| Site | Point | Breeding Species Diversity | Breeding Species Richness | OHV Trail Density | Utme | Utmn |
|---|---|---|---|---|---|---|
| Havasu NWR - California | 8 | **10.67** | 13 | • | 734250 | 3833750 |
| Havasu NWR - California | 13 | **10.07** | 12 | • | 732750 | 3840000 |
| Havasu NWR - California | 4 | **9.19** | 10.5 | • | 734250 | 3834000 |
| Havasu NWR - California | 9 | **9.08** | 10.5 | • | 734500 | 3833500 |
| Vidal Wash | 38 | **8.32** | 9 | • | 730250 | 3776250 |
| Chemehuevi Wash | 29 | **8.26** | 9.5 | • | 732500 | 3815000 |
| Chemehuevi Wash | 28 | **8.25** | 10 | • | 733000 | 3815250 |
| Upper Chemehuevi Wash | 7 | **8.13** | 9 | • | 720250 | 3812250 |
| Chemehuevi Wash | 34 | **7.89** | 8.5 | • | 731750 | 3814500 |
| Havasu NWR - Arizona | 2 | **7.88** | 9 | • | 734250 | 3838500 |
| Havasu NWR - California | 17 | **7.84** | 9 | • | 733250 | 3835500 |
| Havasu NWR - California | 20 | **7.64** | 8.5 | • | 734000 | 3835500 |
| Whipple Mountains Wilderness | 7 | **7.59** | 8.5 | • | 751000 | 3795500 |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**2006 Drought**

- **146 consecutive days without rain in Phoenix (October – March)**

- **Nesting initiated 4-6 weeks late for all species**

- **Average LOSH clutch-size dropped from 5 to 3 eggs.**

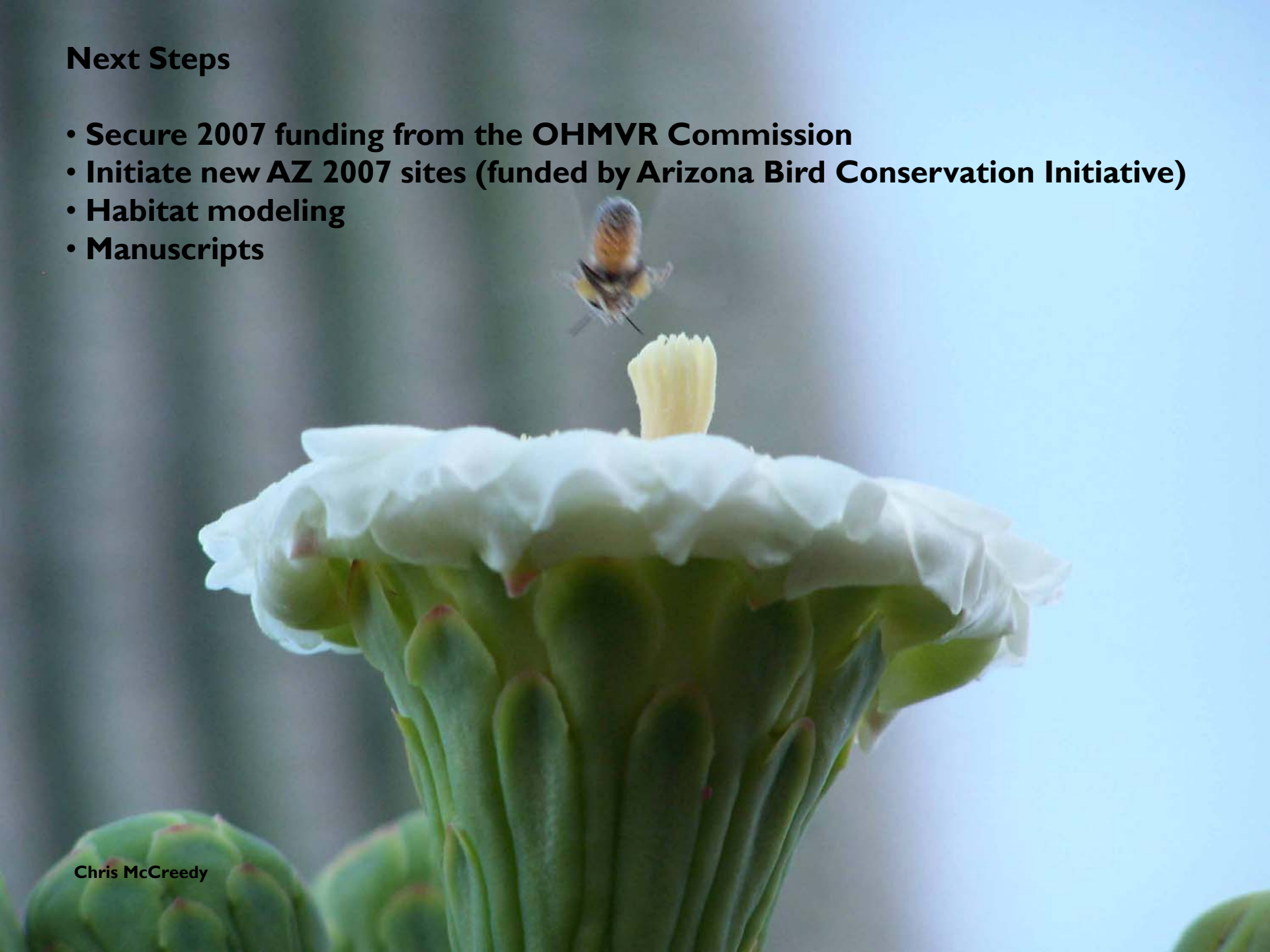
- **BTGN nesting delayed until after arrival of BHCO, nest success around 5%.**

- **Nesting pushed well into June, (most notably, BETH) several late nests failed due to extreme daytime temperatures.**

- **Save a few exceptions, only Verdin, Black-tailed Gnatcatchers, Loggerhead Shrikes, and cavity nesters bred in 2006. Of these, only Verdin and Ladder-backed Woodpeckers seemed to approach nest success of previous seasons.**

## Next Steps

- Secure 2007 funding from the OHMVR Commission
- Initiate new AZ 2007 sites (funded by Arizona Bird Conservation Initiative)
- Habitat modeling
- Manuscripts



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NU-AD
SPF 30
SUN BLOCK
LOTION