Recent Golden Eagle Nest Surveys and Nesting History in Yolo, Solano, and San Luis Obispo Counties, California

Jeff P. Smith, PhD
H. T. Harvey & Associates
Los Gatos, CA
Presentation Objectives

- Summarize recent surveys in three areas of west-central California that yielded information about nesting Golden Eagles

- Discuss nest-site and habitat characteristics

- Summarize productivity data where available

- Review known nesting histories
Study Areas

- Ridges of w Yolo and e Napa Counties
- Montezuma Hills Wind Resource Area, Solano County
- Carrizo Plain and adjacent ranges, San Luis Obispo County
Yolo / Napa County Surveys

- Raptor migration and general activity surveys from several ridgetop and adjacent foothill locations
- 15 days for 2 - 7 hours: 4 April – 13 May 2011
- Detailed mapping of occurrence locations and flight paths enabled general delineation of Golden Eagle nesting territories
- No eagle nest sites specifically located
Ridgetops at 500-700 m; valley floor at ~100 m elevation
Yolo / Napa County Territory Mapping

Likely third territory to SE and possibly fourth to SW

2 km
Yolo / Napa County Nesting History


Surveyed Sites

Occupied Sites

● approximate recent study area location
Yolo / Napa County Nesting History

California Department of Fish & Game
California Natural Diversity Data Base
Montezuma Hills WRA Study Area

Wind Resource Area (~40,300 acres)

Nest Survey Area 2011 (~10-mile radius)
Montezuma Hills Surveys

- Active wind-energy area since early 1990s
- Major on-going expansion/repowering since 2004
- Projected 2013 generating capacity of 970+ MW
- Raptor nest surveys conducted intermittently and at variable geographic scales since 1988
- Some knowledge of Golden Eagle nesting on WRA annually 1981-1996 and most years in 2000s
- Broader 5-10 mile radius surveys conducted in 2007 and 2011
Montezuma Hills Habitat

Former Callahan eagle nest site
Montezuma Hills Nest Surveys

1980/1990s - mostly confined to WRA
- Orloff & Flannery 1992 – CEC tri-county study
- Howell 1997 – SMUD final report

Callahan nest site active on WRA most years 1988-1996

2000s - mostly confined to WRA
- Curry & Kerlinger 2004 – Hamilton Ranch report
- Kerlinger et al. 2005 – Shiloh I risk assessment report
- Kerlinger et al. 2006 – High Winds final report
- Kerlinger et al. 2006 – Shiloh II preconstruction report
- Kerlinger et al. 2011 – Shiloh IV assessment report

Two other nesting areas documented on WRA

Late 2000s - extend 5-10 miles beyond WRA
- Hunt et al. 2007 – Curry & Kerlinger report
- Jackman & Hunt 2011 – Collinsville report

Five other nesting areas documented outside WRA
Montezuma Hills Recent Nesting History

HT Harvey & Associates 2012

• First active nest on WRA since 2007
• 1.2 miles SSW of former Callahan nest site
• 0.6 mi to operating turbine; <0.5 mi from active construction
• Incubated for 2-3 weeks then abandoned
• Pair still in general area as of November – feeding on abundant sheep carcasses

Photos by Robert Shields
# Montezuma Hills WRA Nesting History

## Territory

<table>
<thead>
<tr>
<th>Year</th>
<th>Callahan</th>
<th>Masson</th>
<th>Emigh / Currie Road</th>
<th>Mien’s Landing</th>
<th>Powerline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>East</td>
<td>West</td>
<td></td>
</tr>
<tr>
<td>1988-91</td>
<td>Active</td>
<td>RT / GO</td>
<td>-</td>
<td>-</td>
<td>?</td>
</tr>
<tr>
<td>1993-96</td>
<td>Active</td>
<td>RT / GO?</td>
<td>-</td>
<td>-</td>
<td>?</td>
</tr>
<tr>
<td>2001</td>
<td>Inact?</td>
<td>Active?</td>
<td>-</td>
<td>SWHA</td>
<td>?</td>
</tr>
<tr>
<td>2004</td>
<td>Fledged</td>
<td>Inact</td>
<td>Failed</td>
<td>GHOW</td>
<td>?</td>
</tr>
<tr>
<td>2005</td>
<td>Failed</td>
<td>Inact</td>
<td>Gone</td>
<td>Failed</td>
<td>?</td>
</tr>
<tr>
<td>2007</td>
<td>Fledged</td>
<td>Inact</td>
<td>Gone</td>
<td>RTHA</td>
<td>-</td>
</tr>
<tr>
<td>2009</td>
<td>SWHA</td>
<td>Inact</td>
<td>Gone</td>
<td>RTHA</td>
<td>?</td>
</tr>
<tr>
<td>2010</td>
<td>SWHA</td>
<td>Inact</td>
<td>Gone</td>
<td>RTHA</td>
<td>?</td>
</tr>
<tr>
<td>2011</td>
<td>Gone</td>
<td>Inact</td>
<td>Gone</td>
<td>RTHA?</td>
<td>Fledged</td>
</tr>
<tr>
<td>2012</td>
<td>Gone</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>Failed</td>
</tr>
</tbody>
</table>
Montezuma Hills Area Nest Sites

Mostly in eucalyptus trees
Montezuma Hills Vicinity Nesting History


Surveyed Sites

Occupied Sites

 approximate study area location
Montezuma Hills Vicinity Nesting History

California Department of Fish & Game
California Natural Diversity Data Base
Carrizo Plain Study Area

- California Valley Solar Ranch
- Topaz Solar Farm
- CVSR 10-mile radius survey area
Carrizo Plain Surveys

Two photovoltaic solar facilities under construction will encompass several thousand acres of primarily disturbed ag fields and annual grassland.

Brian Latta 2010: initial survey for USFWS covering 10-mile radius around both projects.


2 - 4 helicopter survey rounds per year.
Carrizo Plain Habitat

Eastern ranges to 1200 m, western ranges to 1,000 m, Valley floor at ~600 m elevation
Carrizo Plain Survey Results

Latta 2010
• Two survey rounds in early and late May
• 22 nest sites comprising 12 occupied territories
• 9 nests produced 14 4-8 week old chicks
• 2 other nests may have failed early
• 9 nests in trees, 8 on transmission towers, 5 on cliffs
Carrizo Plain Survey Results

H. T. Harvey & Associates 2012

- Resurveyed all but one of Latta’s territories
- 25 nest sites comprising 16 occupied territories
- 2 former nests no longer present
- 13 nests in trees (9 oaks, 4 cottonwoods), 8 on transmission towers, 4 on cliffs/outcrops
- 14 nest starts (eggs laid) confirmed
- 2-3 failures: 1 incubation, 1 early brood-rearing, and 1 possible late brood-rearing
- 18-19 fledglings = 1.4-1.5 per nest start

High productivity both years!
Carrizo Plain Nesting Territories

Most nests on east side of Temblor Range or in west-side ranges in sparse oak woodland/grassland areas or on transmission towers crossing open grassland

Study site map showing nest locations not available for public posting.
Carrizo Plain Nesting History


Surveyed Sites

Occupied Sites

approximate CVSR study area location
Conclusions and Relevant Future Efforts

Yolo County

- Western ridges are an important historic and current nesting area for Golden Eagles
- No current plans to develop wind energy on study-area ridges
- 600 MW wind-energy facility being considered for Dunnigan Hills 25 km to NW
- No known eagle nesting in this area, but Swainson’s Hawks commonly nest there
Conclusions and Relevant Future Efforts

Solano County

• Montezuma Hills historically supported low density of nesting eagles

• Crop agriculture and wind facilities mostly incompatible with continued nesting in WRA, but resident / transient eagles often forage in area

• WRA nearly built out, unless expand to north

• Newer and some existing wind projects now faced with obtaining Golden Eagle take permits

• General avian activity surveys and ground-based monitoring of eagle nesting will continue in several areas for next 2-3 years
Conclusions and Relevant Future Efforts

San Luis Obispo County

- No eagle nesting on Carrizo Plain itself except possibly on transmission lines
- Neighboring ranges and foothill oak woodlands support moderate density of nesting eagles – recently very productive
- No other solar facilities currently planned for Carrizo Plain, but others likely to north
- Eagle nesting surveys will continue annually through 2016 around CVSR to determine if loss of foraging habitat due to solar development influences local nesting population