Humboldt marten denning ecology in a managed redwood-dominated forest landscape

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Keith Slauson and Bill Zielinski
U.S. Forest Service Pacific Southwest Research Station, Arcata CA

Courtesy: Matthew Delheimer
Historical Distribution of Pacific Martens (*Martes caurina*) in California

Grinnell et al. 1937
Collected at track plate station, Siskiyou Co., California. Identity deduced from characteristics.
California Forest Practice Rules

Aquatic Habitat Conservation Plan and Candidate Conservation Agreement with Assurances

GREEN DIAMOND RESOURCE COMPANY

FINAL

October 2006 • Volume 2 (Appendices)
• North-South transect
  • 1 km west of Six Rivers National Forest
• ~54 remote camera stations
  • 500-m intervals
Photos Courtesy of Mark Herse
• 33 captures
  • 18 males, 15 females
• 24 radio-marked
  • 13 males, 11 females
• Additional un-marked individuals
Objectives

- Rest & Den Sites
  - Document and characterize structures
  - Stand characteristics
  - Natal vs maternal den use
  - Site fidelity
- Reproductive Efforts
- Kit Production
- Denning Phenology

Courtesy: Max Marquez
• Natal Dens – site of parturition
• Maternal Dens – Sites where kits are present exclusive of parturition
• > 2,000 telemetry locations
• 150 Rest Sites
• 34 Confirmed Dens

Courtesy: Matthew Delheimer
• Females localize movements mid-March through early April
• Earliest confirmed den = March 17\textsuperscript{th}
• Earliest confirmation of kits = April 9\textsuperscript{th}
• Consistent with other studies
  • (Strickland et al. 1982)
  • (Henry and Ruggiero 1994)
Den Structures

Number of Dens

- Live Tree
- Snag
- Log / Rock Pile
- Artificial Rest Box
- Subterranean

Natal
Maternal

Courtesy: Max Marquez
Location on Den Structure

![Bar chart showing the number of dens in different locations on a den structure. The chart includes categories for Cavity, Chamber, Platform, Chamber/Burrow, and Unknown. The chart compares 'Natal' and 'Maternal' dens.](image)

Courtesy: Max Marquez
Den Structures – Live Trees & Snags

- Larger diameter trees (n=28)
  - Average DBH = 3’
  - DBH Range = 1.5’ – 6’

Courtesy: Matthew Delheimer
Den Structures – Live Trees & Snags

Trees with complex features

- Broken Top
- Dead Top
- Large Limbs
- Complex Branching
- Basal Hollows
- Multiple Cavities
Den Location

Variable Height
(underground – 65+ feet)

Cavity Entrance

Rock Pile
Den Location
Variable Height
(Underground – 65 feet)

Courtesy: Matthew Delheimer

Courtesy: Max Marquez
Range = 20’ to 2,000’
F05 Den Sites (2014-2015)

Subterranean
<table>
<thead>
<tr>
<th>Year</th>
<th>Females Monitored (≥ 1 yr)</th>
<th>Reproductive Attempts</th>
<th>Successful Females</th>
<th># Kits Produced</th>
<th># Kits Weaned</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>7</td>
<td>5</td>
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<td>2015</td>
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<td>2016</td>
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75% F05 and two kits (2015)
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• Females that attempted reproduction were at least 2 yrs of age but majority (67%) >2 yrs
• Females <2 yrs did not attempt reproduction
• Successful females produced an average of 1.8 kits per female per year
  • Range = 1-3 kits per female
  • 73% produced ≥ 2 kits per year
Den Site Fidelity

• Den Reuse
  • 60 % Within Season (n=5)
    • F04
    • F06
    • F15
  • 50% From Previous Season (n = 4)
    • F04
    • F06
## F04 - Den Site Fidelity

<table>
<thead>
<tr>
<th>Year</th>
<th>Kits</th>
<th>Total Dens</th>
<th>Unique Dens</th>
<th>Within Season</th>
<th>From Previous Season(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>1 (Maternal Den)</td>
<td>NA</td>
</tr>
<tr>
<td>2015</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1 (Natal Den)</td>
<td>1 (2014 natal den)</td>
</tr>
<tr>
<td>2016</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>1 (2014-2015 natal den)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7</strong></td>
<td><strong>9</strong></td>
<td><strong>6</strong></td>
<td><strong>2</strong></td>
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</tr>
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### Reuse

- **2015 Natal Den**
- **2016 Natal Den**
F05 & Kits With a Mole
Next Steps........

• Rest/Den Sites
• Vegetation Plots for Rest/Den Sites
• Use vs. Availability
• Home Range Analyses
• Collar New Martens?
  • Juveniles, Females......
• Analyze and Publish!!!!!
Past & Present Field Crew
Brent Barry
Trevor Bentz
Matt Delheimer
Josh Easter
Carol Gress
Max Marquez
Conor McNamara
James Mizoguchi
Ashley Morris
Rob Nagal
Patrick Tweedy
Jay Vance

– David Lamphear
– Ric Schlexer
– IERC (Mourad & Greta)
– Humboldt Marten Conservation Group
– The Yurok Tribe
– Chris West
– Kent Barnes
– U.S. Forest Service – RSL
– Green Diamond