

# Humboldt Marten on a Managed Forest Landscape

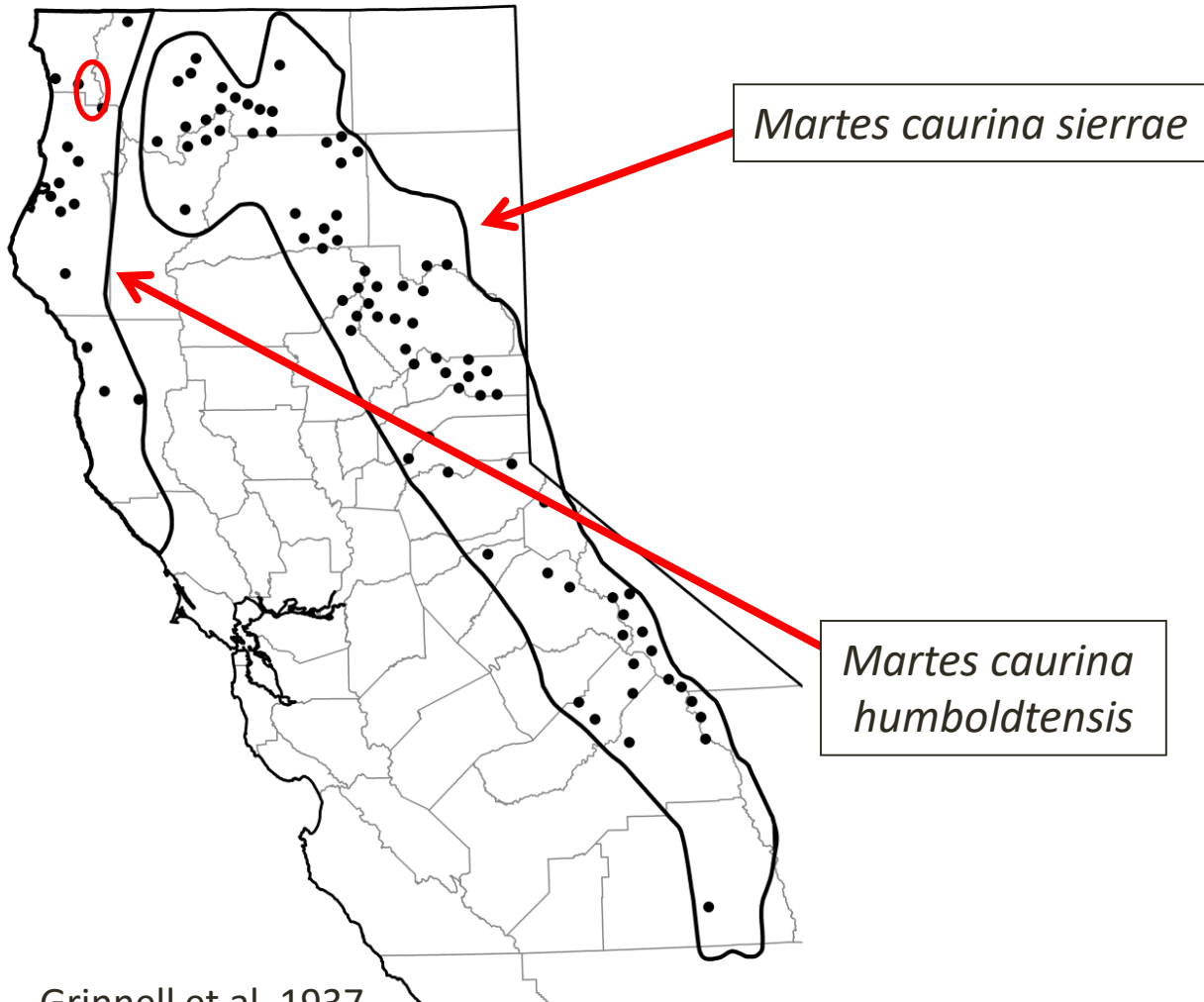


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*Green Diamond Resource Company, Korbelt CA*

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



# Historical Distribution of Pacific Martens (*Martes caurina*) in California



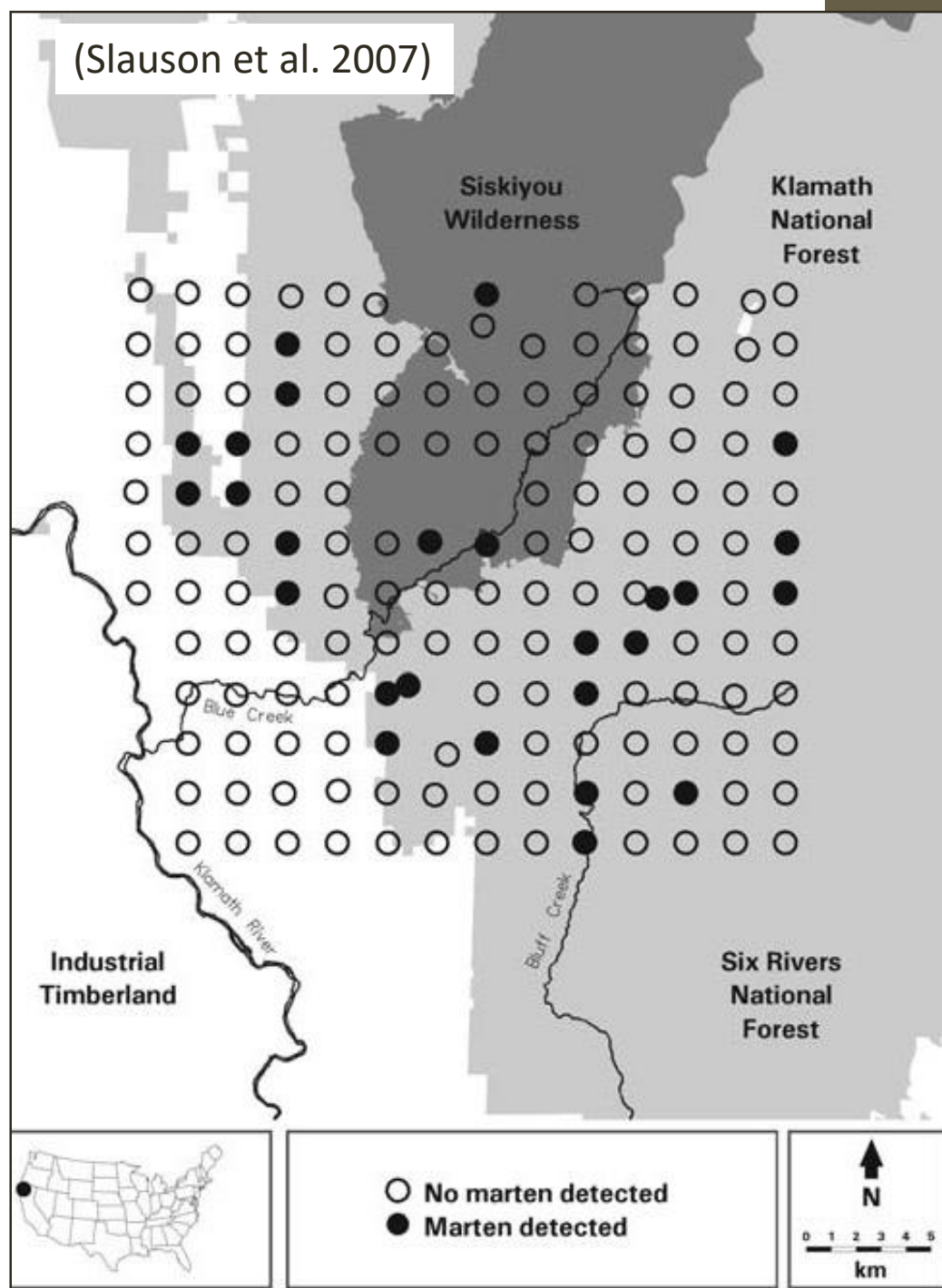


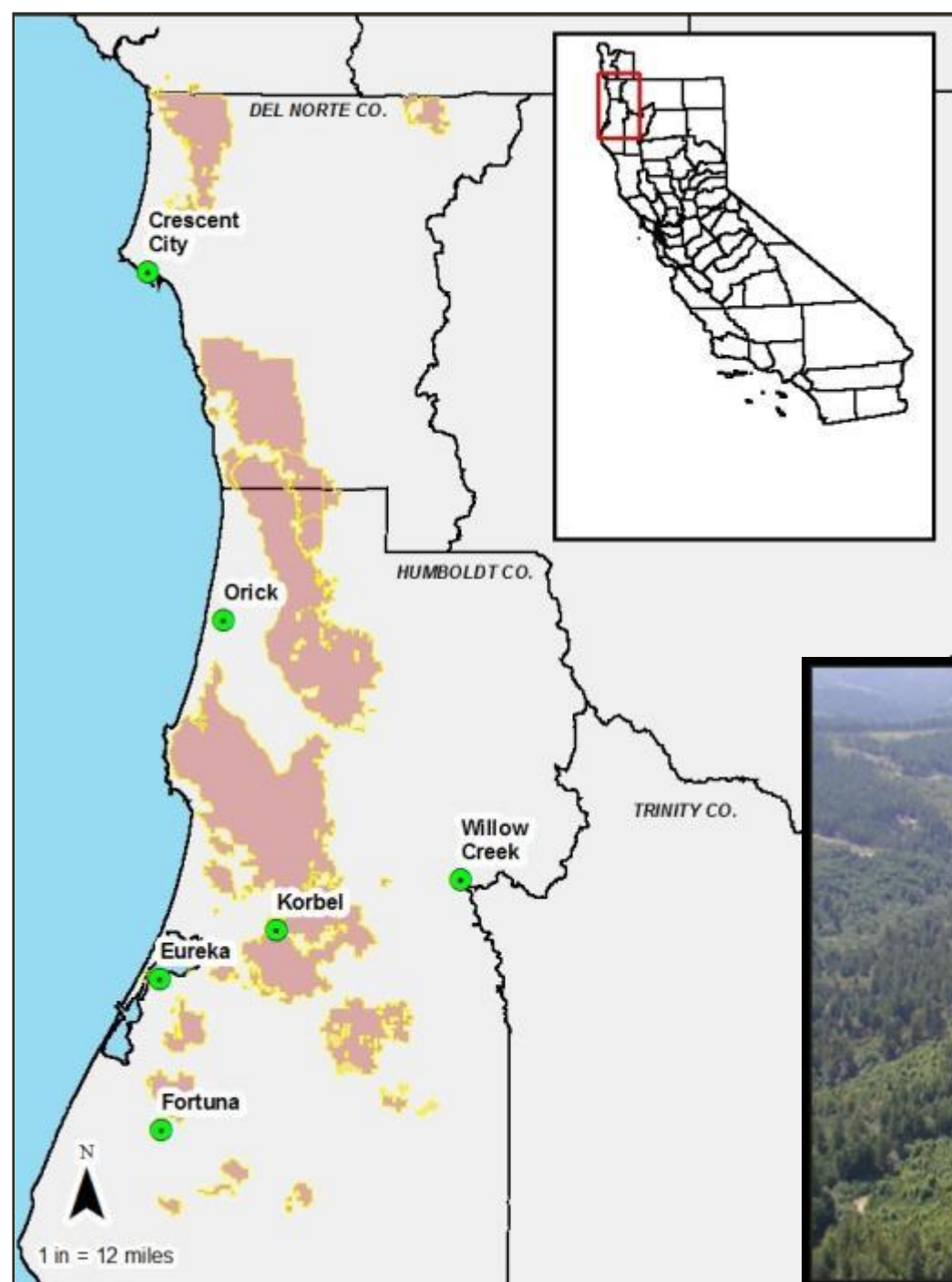


Collected at track plate station, Siskiyou Co., California. Identity deduced from characteristics.



(Slauson et al. 2007)





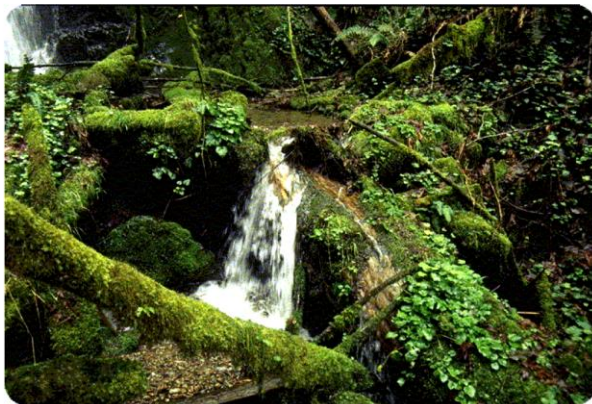


DEL NORTE CO.

Crescent  
City

 **GREEN DIAMOND  
RESOURCE COMPANY**

Aquatic Habitat Conservation Plan and  
Candidate Conservation Agreement with Assurances



FINAL

October 2006 • Volume 2 (Appendices)

**HABITAT CONSERVATION PLAN**

U.S. Fish & Wildlife Service

Deadwood  
nt Plan

**FE  
REE**  
SOURCE

**MOND  
COMPANY**

OWL

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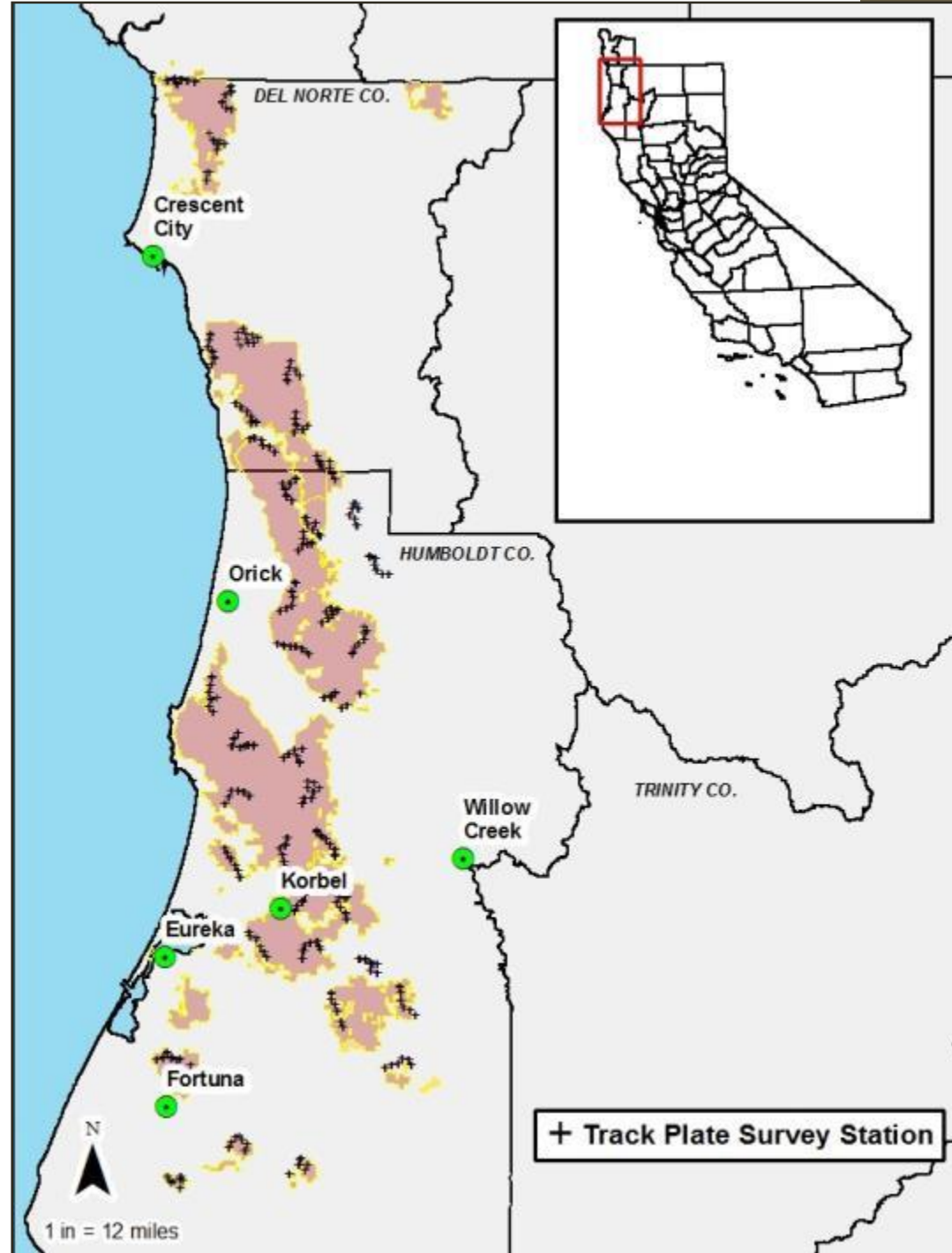
1 in = 12 miles



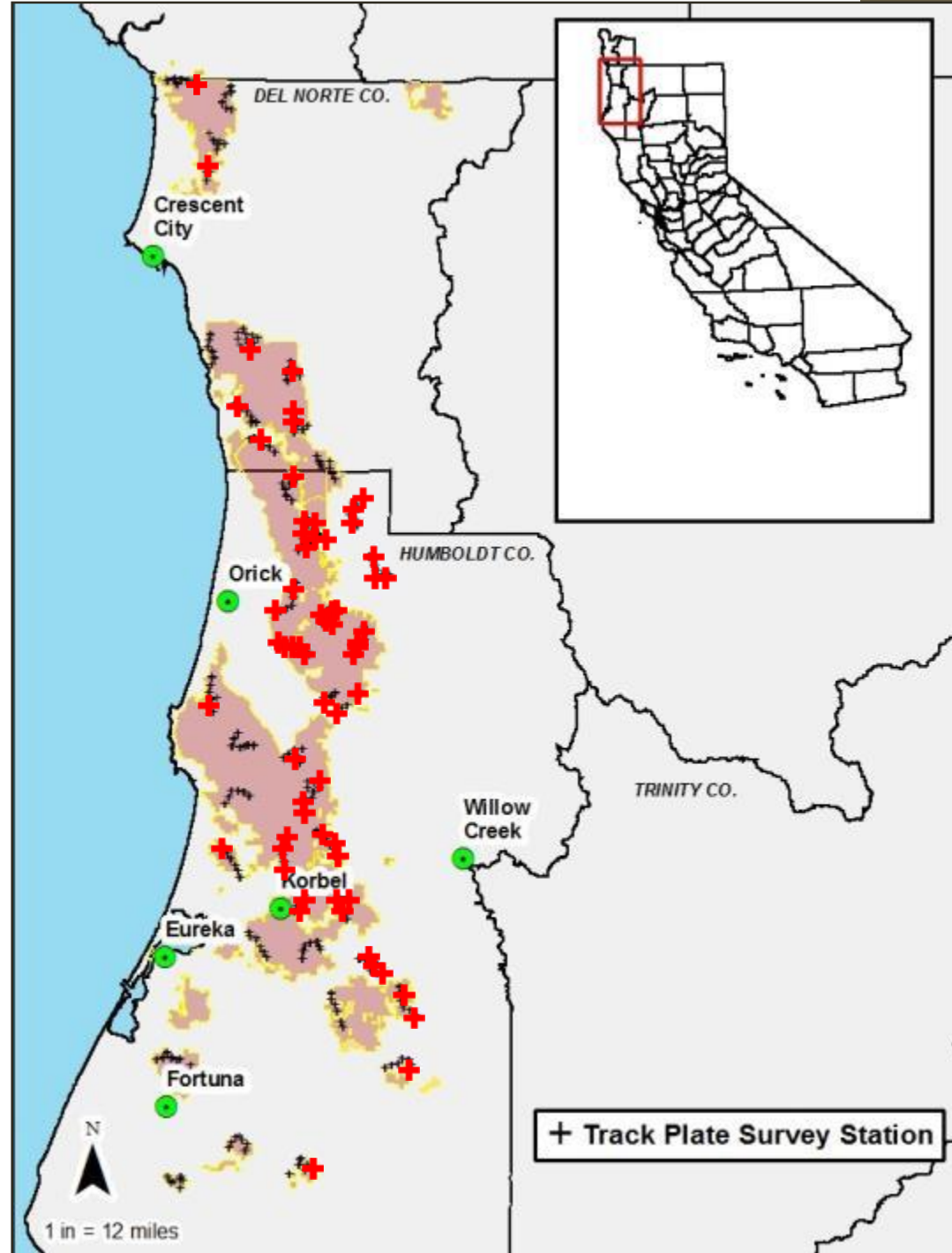
# Fisher Rest Site

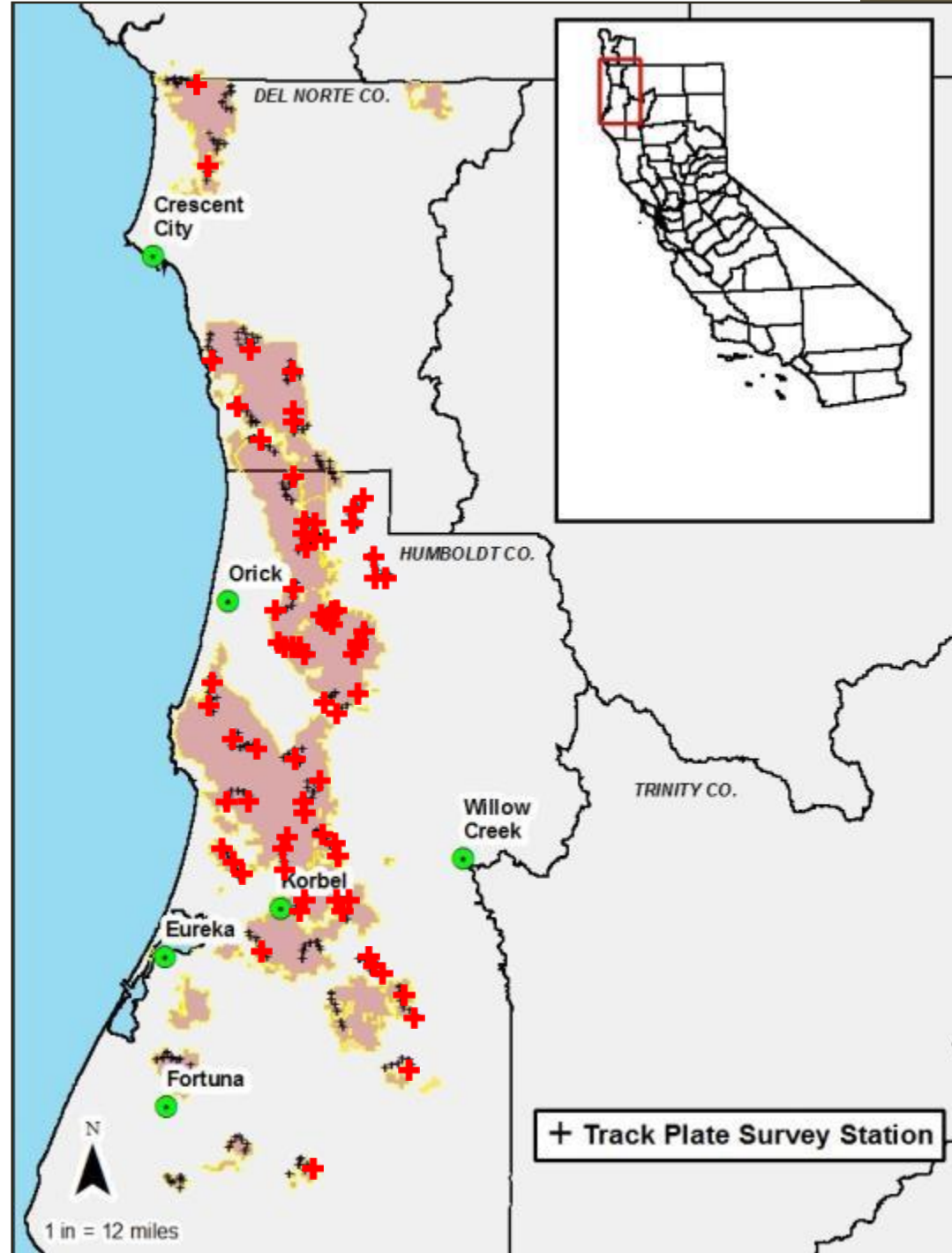




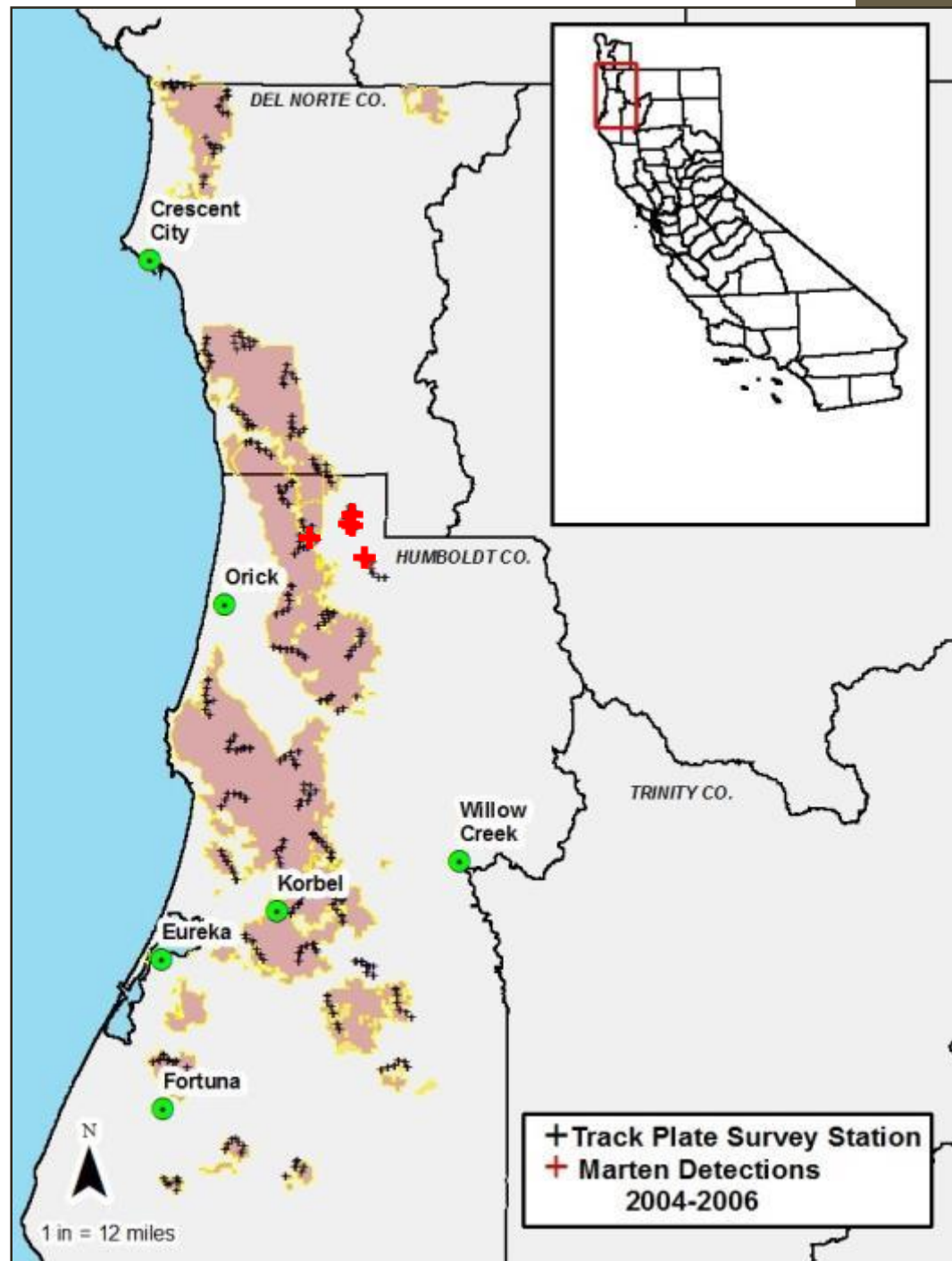


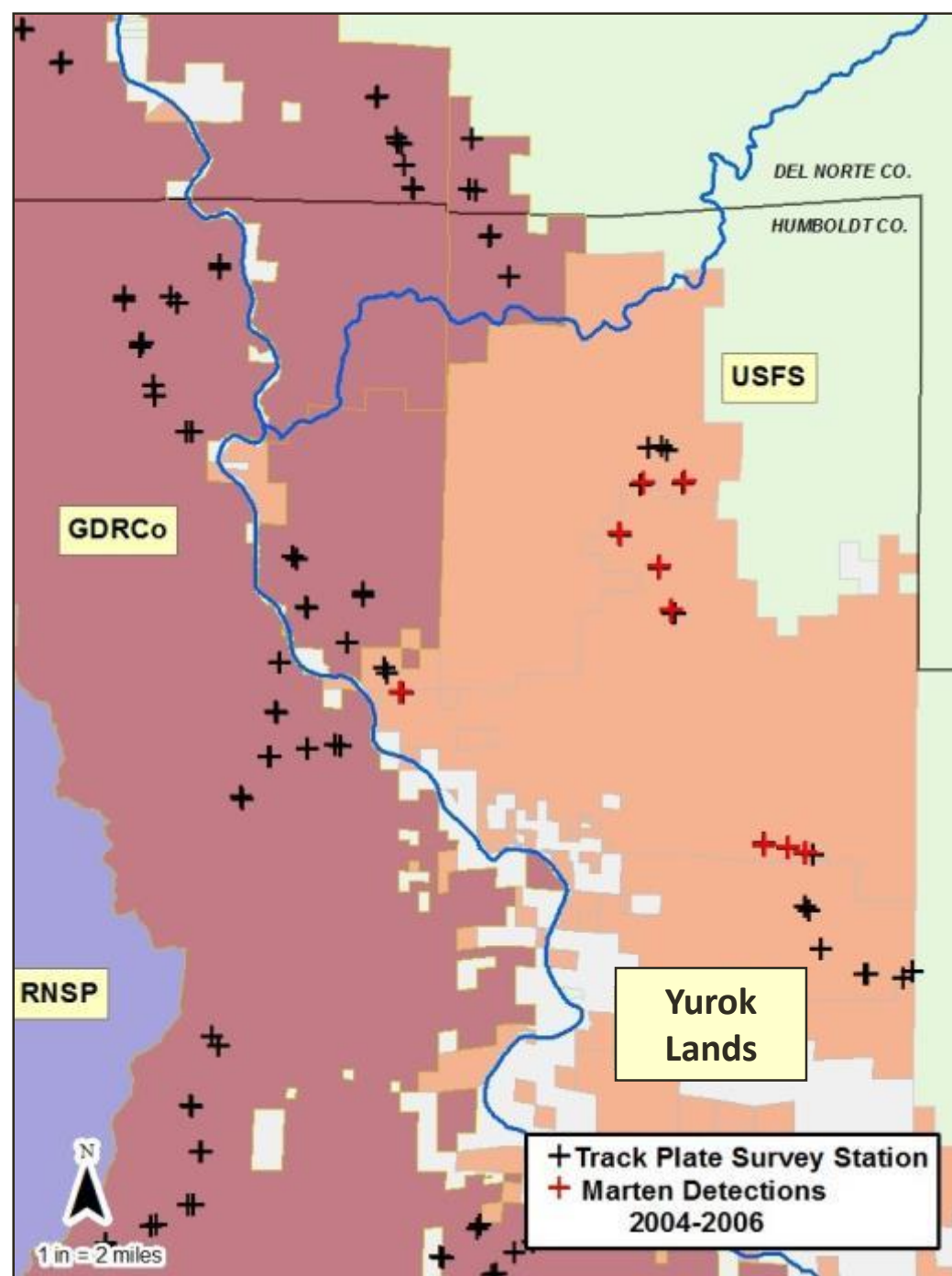




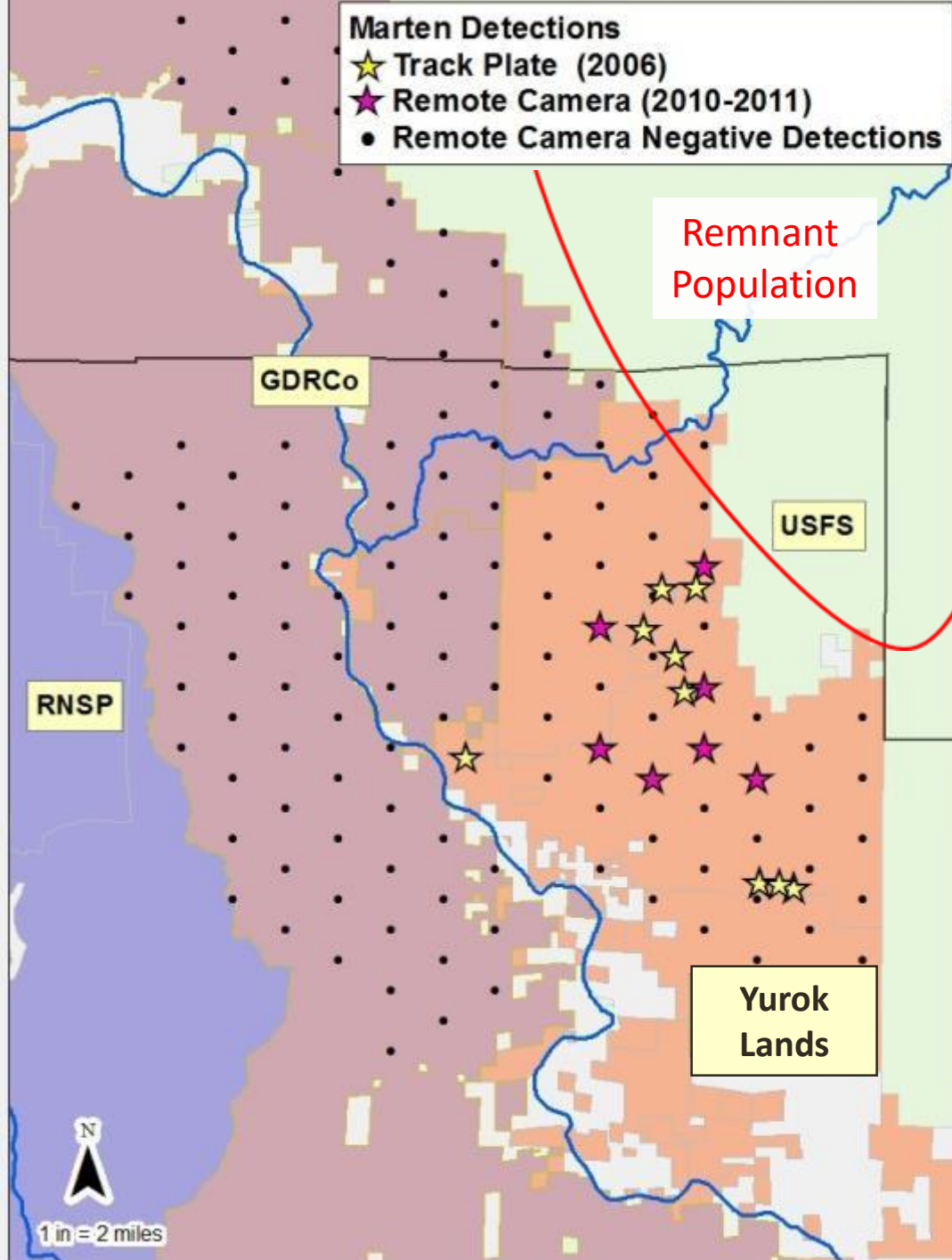


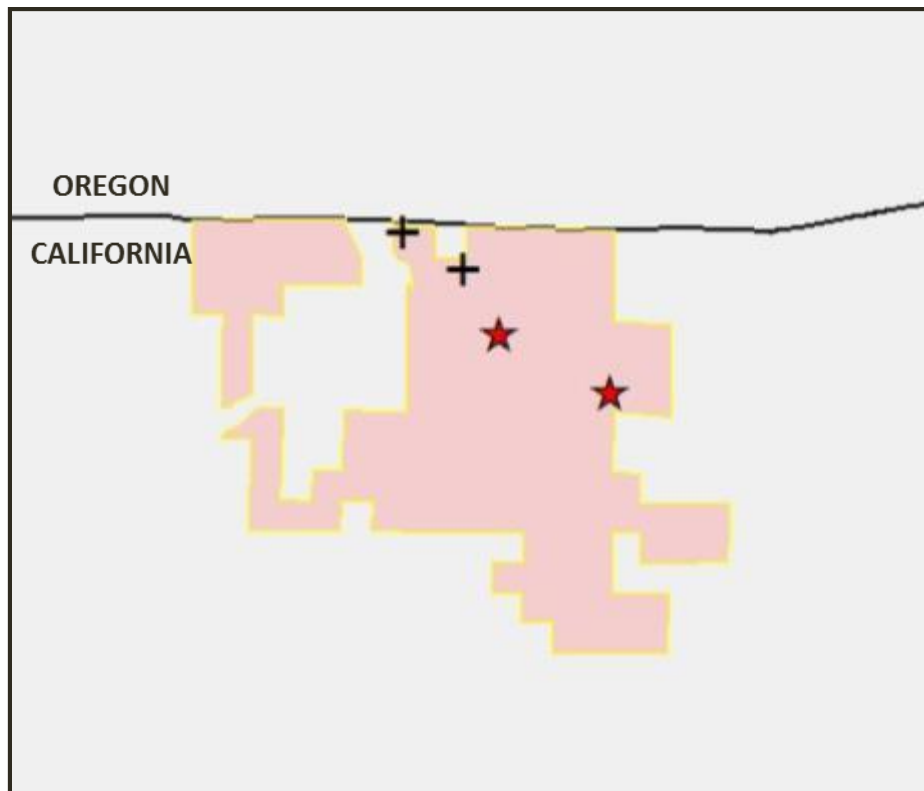
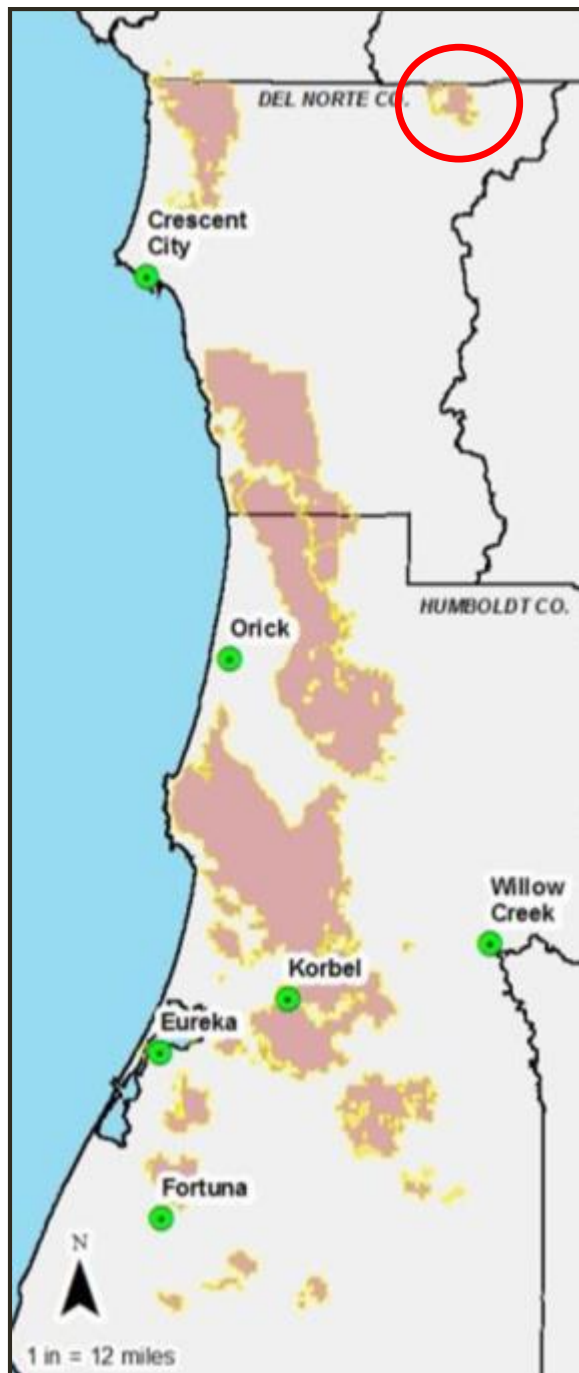
















**Pacific  
Southwest  
Research Station  
(RSL)**

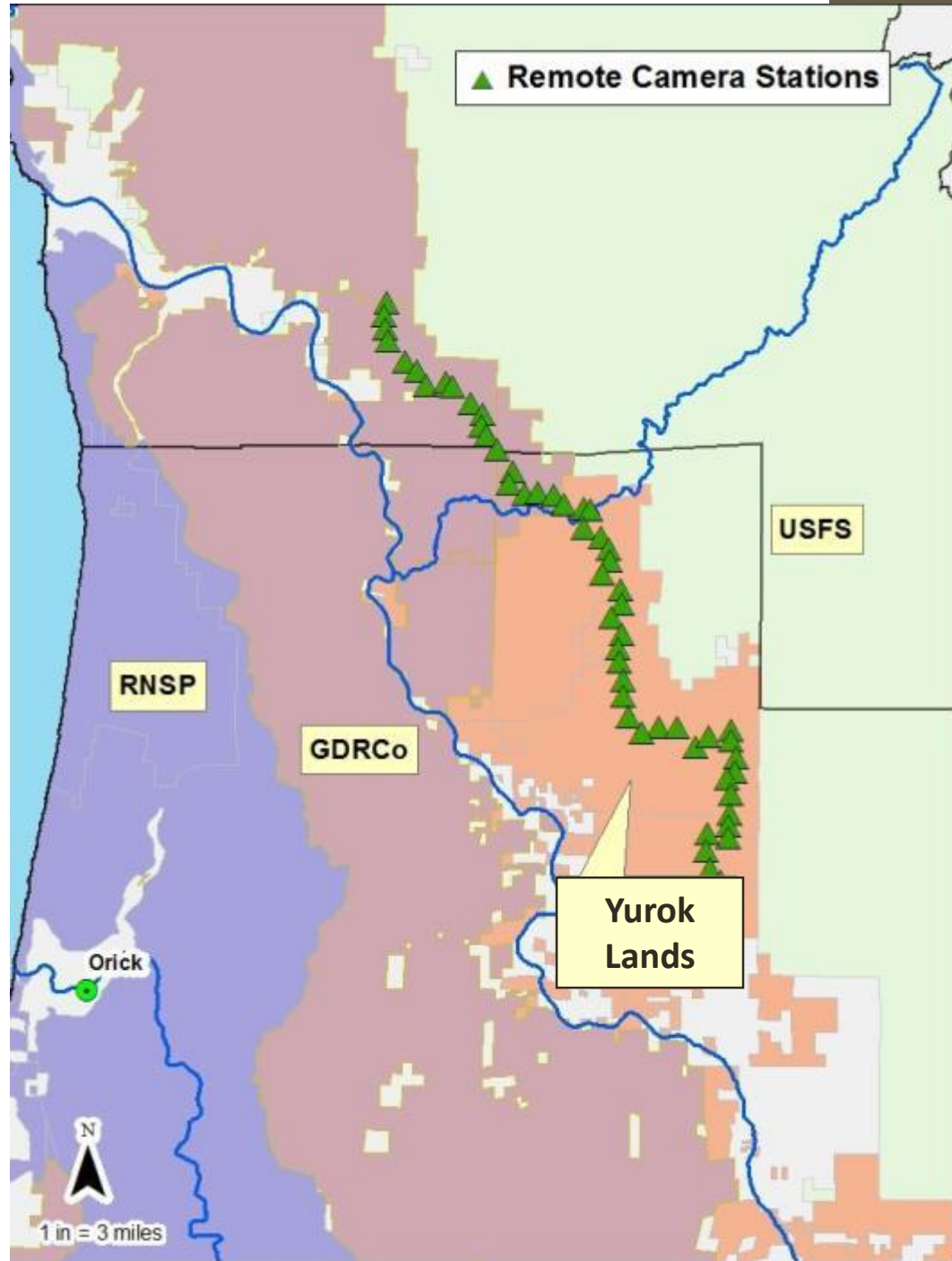


**Yurok Tribe**

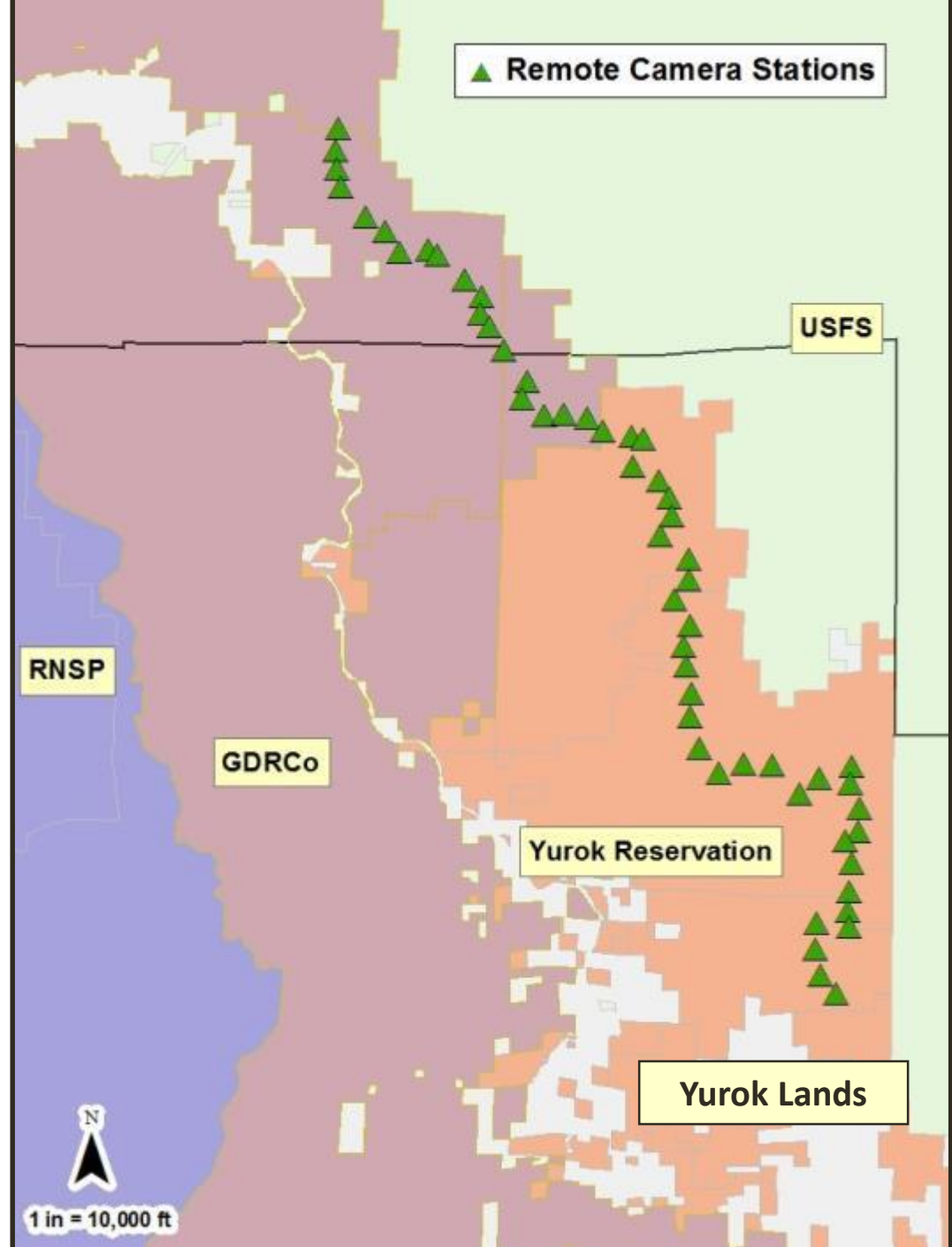
 **GREEN DIAMOND  
RESOURCE COMPANY**



**California Department  
of Fish & Wildlife**



- 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

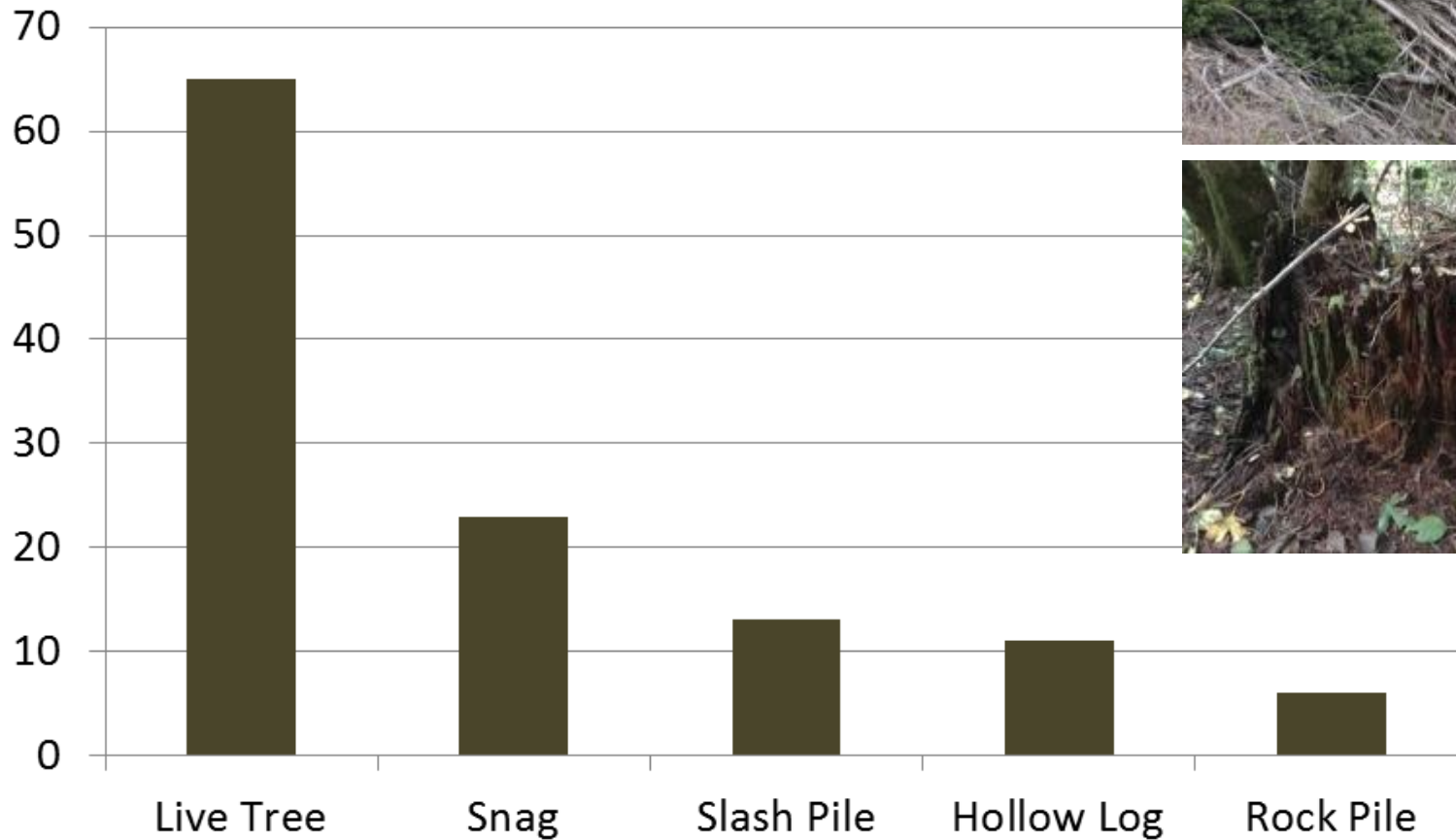


- > 2,000 telemetry locations
- 125 Rest Sites
- 33 Confirmed Dens





# Rest Structures

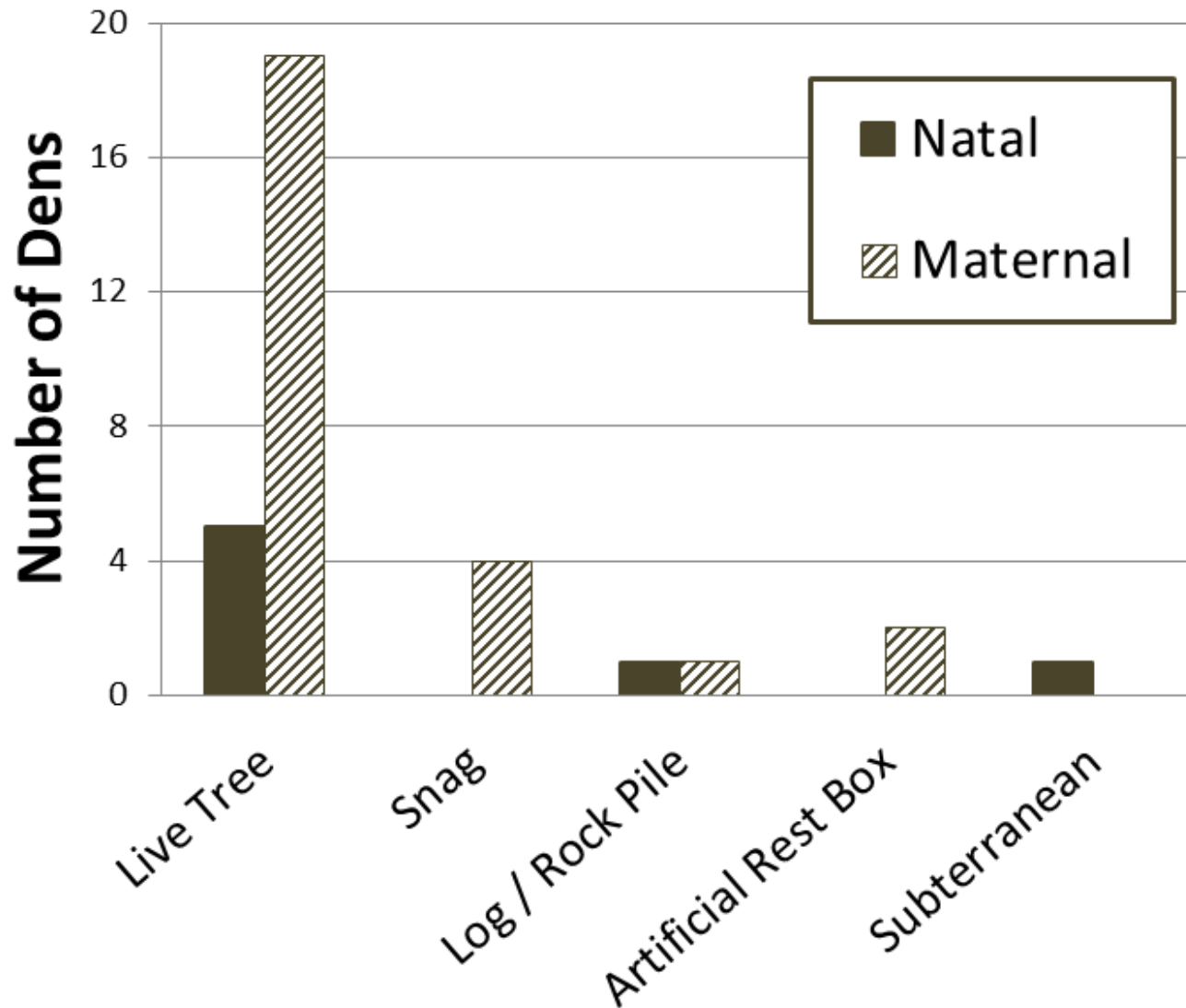


- Females localize movements mid-March through early April
- Earliest documented localization= March 17<sup>th</sup>
- Earliest confirmation of kits = April 9<sup>th</sup>
- Consistent with other studies
  - (Strickland et al. 1982)
  - (Henry and Ruggiero 1994)



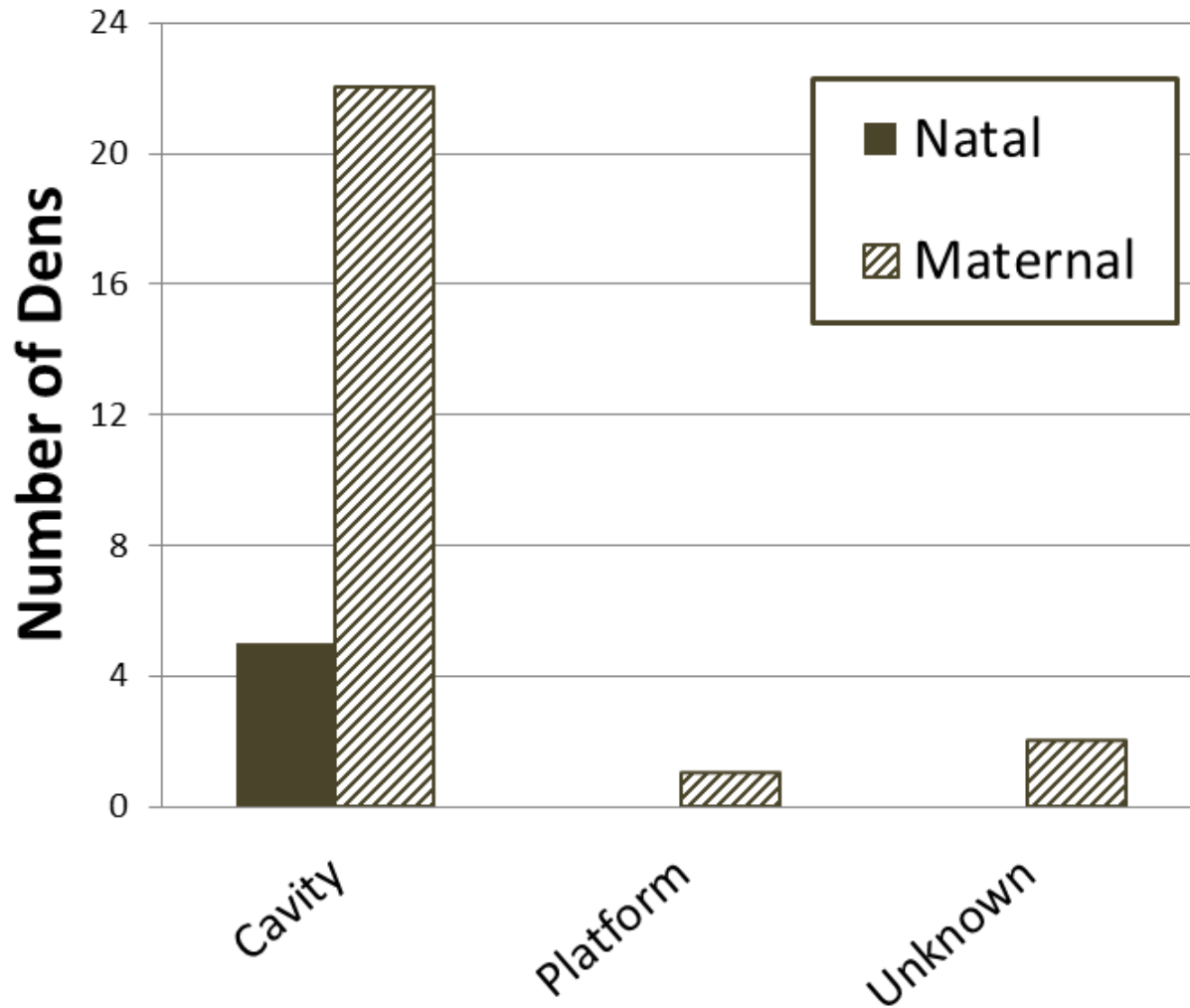


# Den Structures



Courtesy: Max Marquez

# Location on Den Tree/Snag





# Den Structures – Live Trees & Snags

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



# Den Structures – Live Trees & Snags

## Trees with complex features

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





## F15 – 2016 Maternal Den



Photos by Max  
Marquez



## F15 – 2016 Maternal Den



Courtesy: Max Marquez



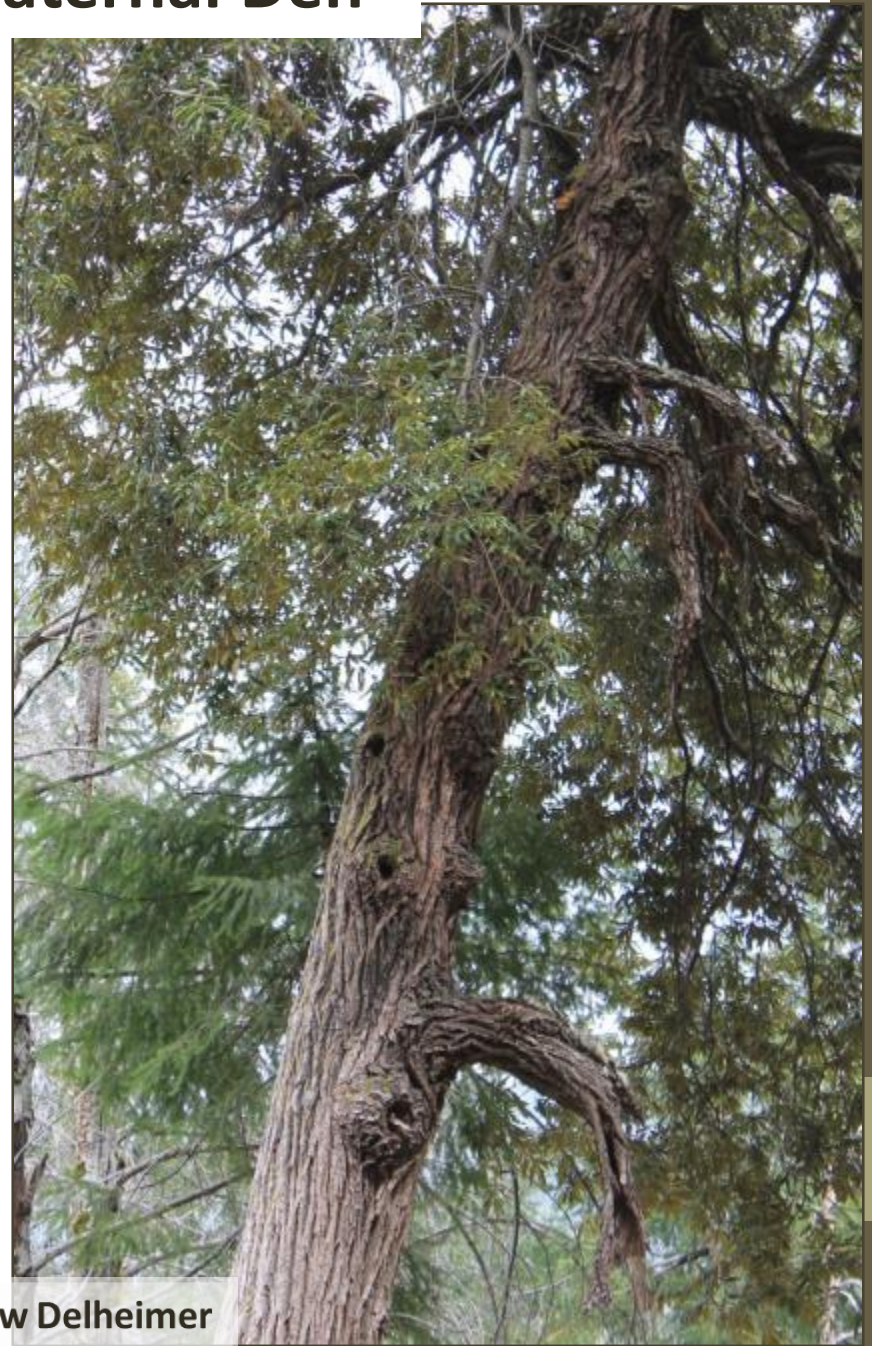
## F06 – 2016 Maternal Den



Courtesy: Max Marquez



## F05 – 2015 Maternal Den



Courtesy: Matthew Delheimer



## F06 – 2016 Maternal Den





# Den Location

Variable Height  
(underground – 65+ feet)



Rock Pile



Cavity Entrance



Cavity Entrance



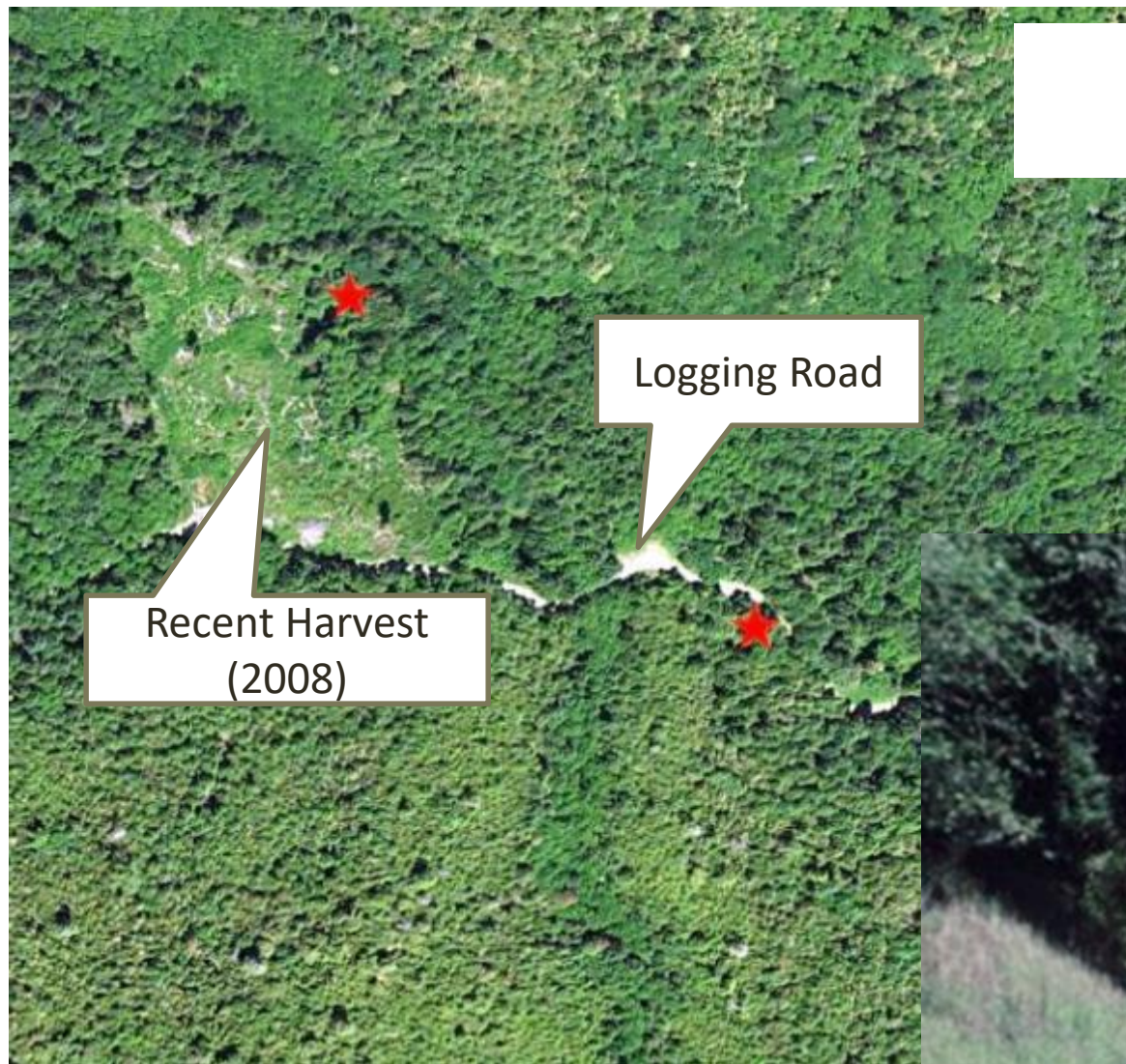
# Den Location

Variable Height  
(Underground – 65 feet)





Range = 20' to 2,000'





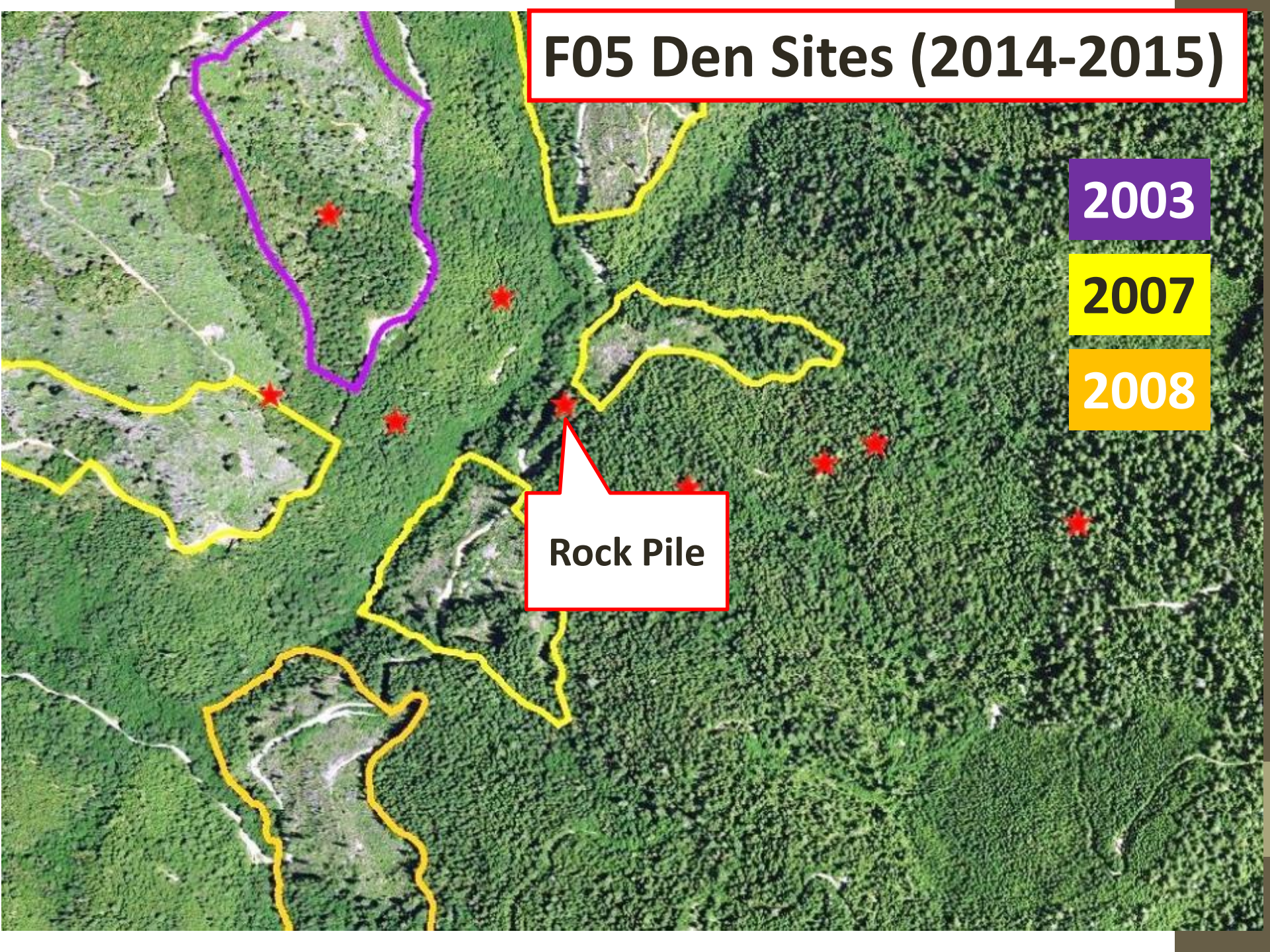
# F05 Den Sites (2014-2015)

2003

2007

2008

Rock Pile





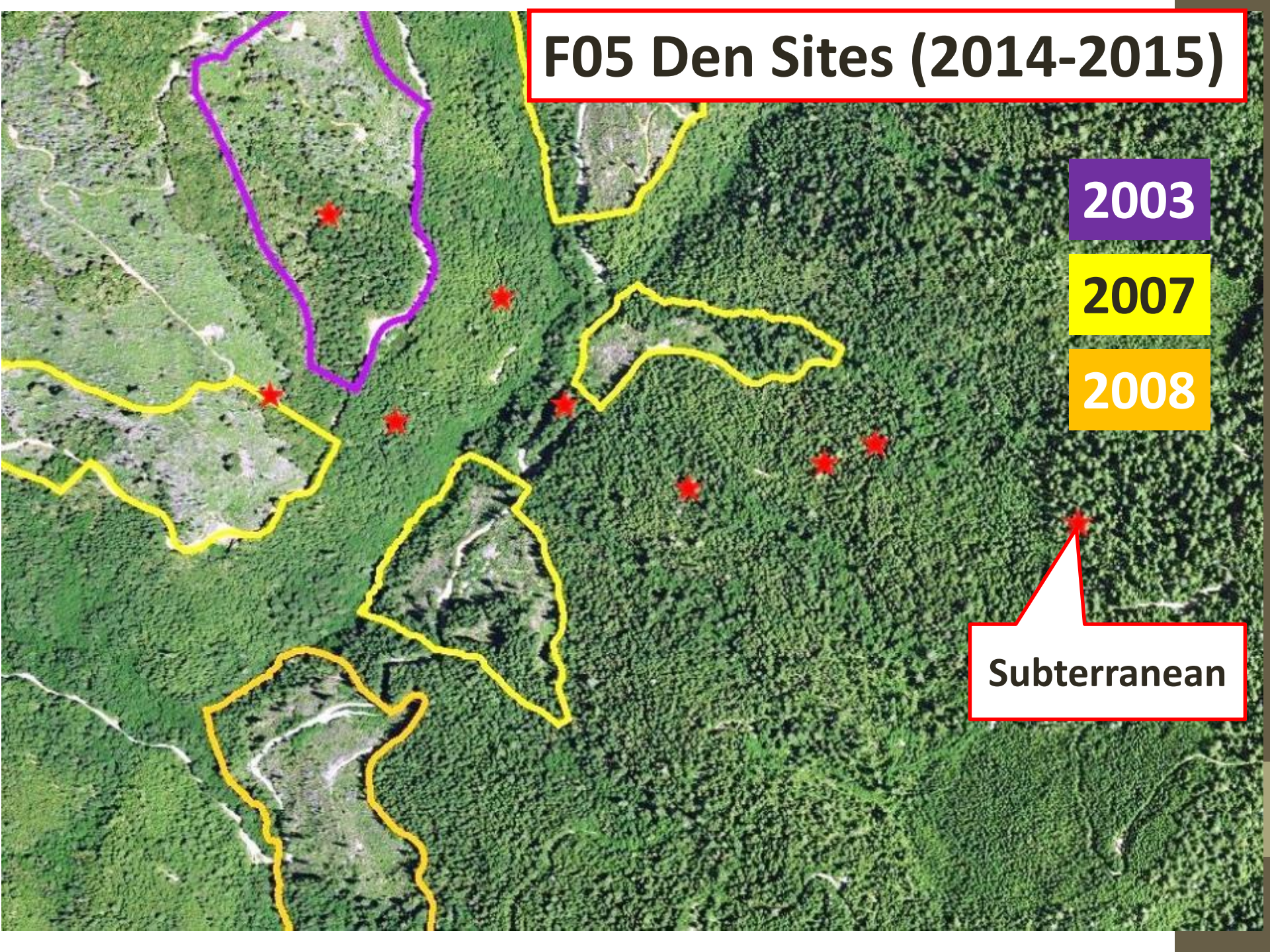
# F05 Den Sites (2014-2015)

2003

2007

2008

Subterranean





<b>Year</b>	<b>Females Monitored (≥ 1 yr)</b>	<b>Reproductive Attempts</b>	<b>Successful Females</b>	<b># Kits Produced</b>	<b># Kits Weaned</b>
<b>2014</b>	<b>7</b>	<b>5</b>	<b>75%</b>	<b>7</b>	<b>6</b>
<b>2015</b>	<b>5</b>	<b>4</b>		<b>6</b>	<b>6</b>
<b>2016</b>	<b>4</b>	<b>3</b>		<b>7</b>	<b>5</b>
<b>Total</b>	<b>16</b>	<b>12</b>	<b>11</b>	<b>20</b>	<b>17</b>



F05 and two kits (2015)

<b>Year</b>	<b>Females Monitored (<math>\geq 1</math> yr)</b>	<b>Reproductive Attempts</b>	<b>Successful Females</b>	<b># Kits Produced</b>	<b># Kits Weaned</b>
<b>2014</b>	<b>7</b>	<b>5</b>	<b>5</b>	<b>7</b>	<b>6</b>
<b>2015</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>6</b>	<b>6</b>
<b>2016</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>7</b>	<b>5</b>
<b>Total</b>	<b>16</b>	<b>12</b>	<b>11</b>	<b>20</b>	<b>17</b>





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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  $\geq 2$  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

Year	Kits	Total Dens	Unique Dens	Reuse	
				Within Season	From Previous Season(s)
2014	2	4	3	1 (Maternal Den)	NA
2015	2	2	1	1 (Natal Den)	1 (2014 natal den)
2016	3	3	2	0	1 (2014-2015 natal den)
<b>Total</b>	<b>7</b>	<b>9</b>	<b>6</b>	<b>2</b>	<b>2</b>







**Courtesy: Matthew Delheimer**

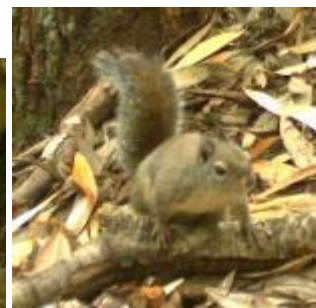
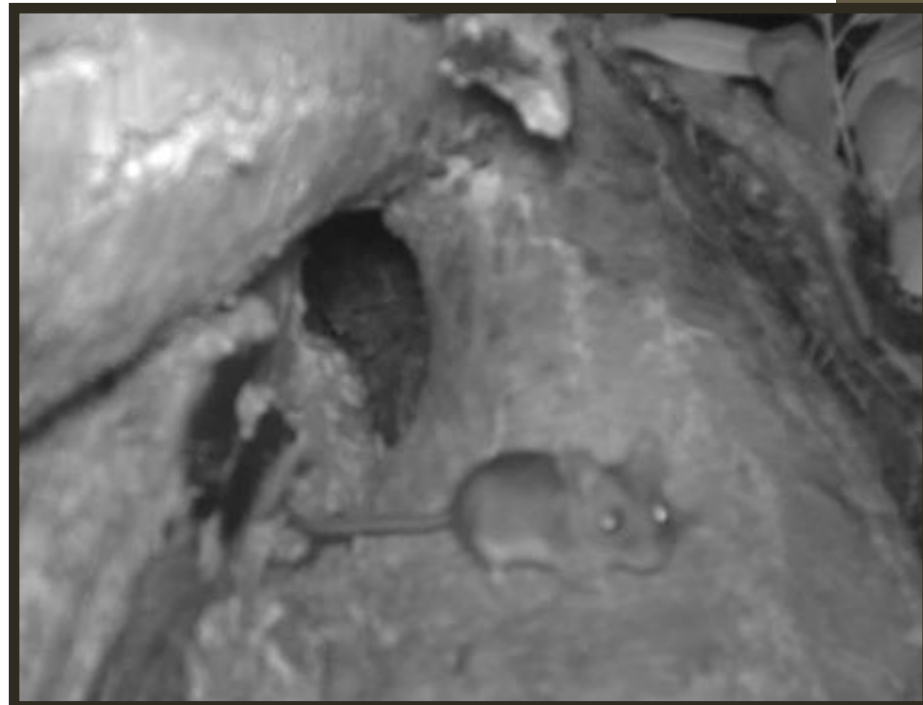
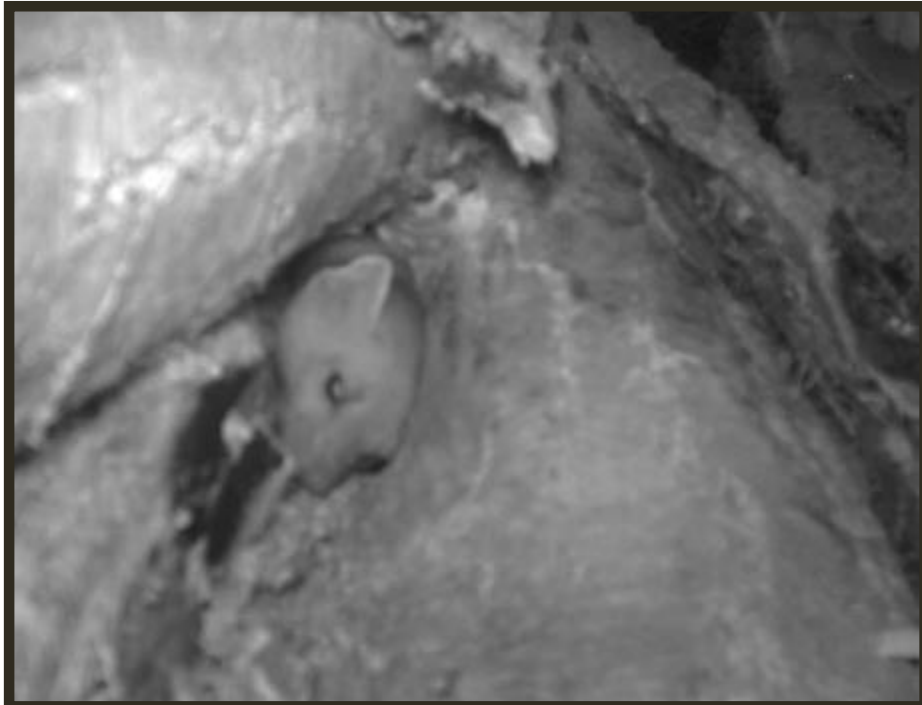




Fisher Den Site













F05 & Kits With a  
Mole



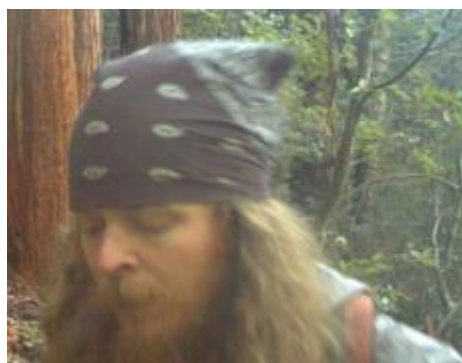
# Next Steps.....

- Rest/Den Sites
- Vegetation Plots for Rest/Den Sites
- Use vs. Availability
- Home Range Analyses
- Other studies...
- Analyze and Publish
- Marten Safe Harbor Agreement



Courtesy Max Marquez





## Past & Present Field Crew

Brent Barry

Trevor Bentz

Matt Delheimer

Josh Easter

Carol Gress

Ian Holl

Lynda Manden

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



