

# A PHOTOGRAPHIC FIELD GUIDE TO FISHER REST AND DEN SITES IN THE SIERRA NATIONAL FOREST

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# FISHERS AND FOREST HABITAT

## What is a fisher?

- A mid-sized carnivore in the Mustelid (weasel) family with chocolate brown fur, short legs and a long tail
- Fishers are excellent tree climbers and have a varied diet (e.g., *small mammals, birds, lizards, berries*).

## Why the interest in fishers and fisher habitat?

- Historical fur trapping and loss of suitable mature forest habitat have led to declines in western states
- Fishers use areas with extensive canopy cover, large trees, and other forest features that take time to develop (e.g., *cavities*), thus their habitat requirements need to be considered in forest management plans.

## Purpose of this guide:

- Provide photographic examples of actual structures used by fishers as reproductive dens and rest sites
- Give field crews, wildlife biologists, and forest managers clues about the types of microsites, structures, and habitat that fishers might use





# FISHER REST & DEN SITES

## What are Rest Sites?

Rest sites are protected places where fishers take refuge from the weather, hide from predators, and sleep in between bouts of travel and foraging.

### Examples include:

- Large live trees with cavities, branch clusters, or large limbs
- Snags with cavities, broken tops, or basal hollows
- Structures near the ground – such as hollow logs, rock piles, and burrows.

## What are Reproductive Dens?

Den sites are secure locations where females give birth and care for their kits. Almost all documented fisher dens have been found in tree cavities.

***NATAL DENS** are trees where females give birth and initially keep kits in the early spring*

***MATERNAL DENS** are structures used after natal dens to house kits that are still nursing*

### Examples include:

- Large diameter live hardwoods and conifers or snags with a cavity in the bole of the tree

## Do fishers re-use rest and den sites?

- Males and females use many rest sites throughout their home ranges in a year. Sites may be used more than once by the same or different fishers, but re-use is generally infrequent.
- All females with kits use a natal den, but the number of maternal dens used each year ranges from 0 to 5. Den trees may be used in multiple years, but this is somewhat uncommon.

# MICROSITES

Fishers use a variety of microsites within larger structures for thermal and physical protection. Many fisher microsites share similar characteristics (e.g., cavities, platforms, broken tops) which can help people identify structures that might be suitable for fishers to use. However, sometimes fishers will select microsites that are so well hidden they cannot easily be seen from the ground.

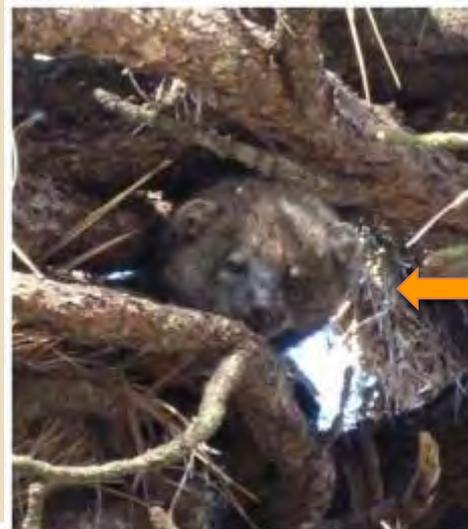
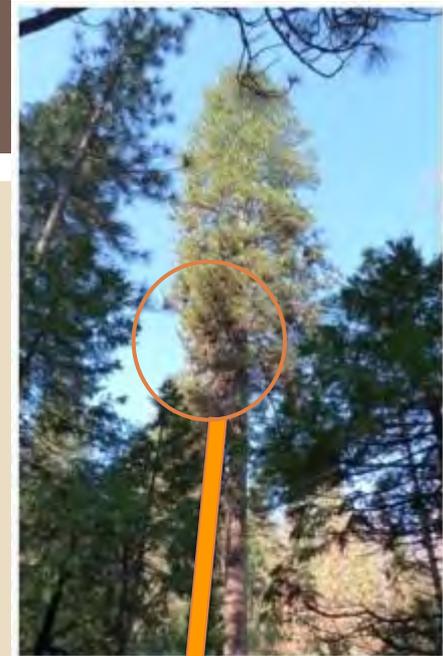
## Microsite types include:

- **Cavities in tree boles or logs**
  - Often accessed through broken limbs, woodpecker holes, scars, or cracks
- **Broken tops of snags**



# MORE MICROSITE EXAMPLES

- **Branch clusters or deformities**  
Often associated with mistletoe
- **Nests/Pine needle-stick clumps**
- **Large branches and tree forks**  
Branches  $\geq 6''$ , often with flat platform
- **Ground burrows/caverns in rocks**



# PHOTO GUIDE TERMS & TIPS

- This guide contains many examples of fisher den and rest sites, but does not represent the full diversity of structures used in the field.
- Examples are presented in the following order 1) natal dens, 2) maternal dens, 3) rest structures, and 4) rest sites used by females with kits during summer/fall.
- Each structure has two slides with photos that provide a feel for the microsite, structure, and surrounding habitat. The first slide for each structure contains measurements and habitat classification on the right.
- **Orange arrows** indicate fishers that are not obvious in photos.
- **Blue arrows** point out microsites in photos when they are not obvious.
- **Structure Type:** conifer/hardwood and live/dead, or an alternative structure
- **DBH:** diameter at breast height (4.5 ft)
- **CWHR** (California Wildlife Habitat Relationship system):
  - Habitat Type
  - Tree Size Class
    - 6 (multi-layered, 5's & 4's or 3's & D cc)
    - 5 (medium/large,  $\geq 24$  in dbh)
    - 4 (small, 11-23.9 in dbh)
    - 3 (pole, 6-10.9 in dbh)
    - 2 (sapling, 1-5.9 in dbh)
    - 1 (seedling,  $< 1$  in dbh)
  - Canopy Cover Class
    - D (dense) – 60-100%
    - M (moderate (39-59.9%))
    - P (open) = 25-39.9%)
    - S (sparse) = 10-24.9%)
    - B (barren) =  $< 10\%$

# NATAL & MATERNAL DEN SITES





## **NATAL DEN**

**TREE #244**

***FEMALE FISHER***

**Structure Type:**  
Live Hardwood

**Tree Species:**  
CA Black Oak

**DBH:**  
27in (69cm)

**Height:**  
74ft (23m)

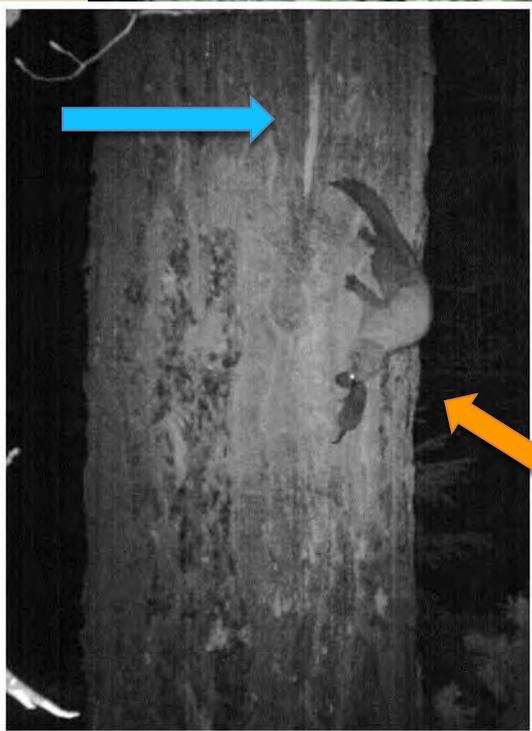
**Microsite:**  
Cavity

**CWHR:**  
Sierran Mixed  
Conifer 4D

**Elevation:**  
4600 ft (1400m)

NATAL DEN: Tree #244  
Live California Black Oak





Female fisher moving young kit at night

**NATAL DEN**

**TREE #1597**

***FEMALE FISHER***

**Structure Type:**

**Live Conifer**

**Tree Species:**

**White Fir**

**DBH:**

**47 in (119cm)**

**Height:**

**108 ft (33m)**

**Microsite:**

**Cavity**

**CWHR:**

**Sierran Mixed  
Conifer 5 M  
(upslope 4 P)**

**Elevation:**

**5200 ft (1590 m)**

NATAL DEN: Tree #1597  
Live White Fir





**NATAL DEN**

**TREE #482**

***FEMALE FISHER***

**Structure Type:**  
**Live Conifer**

**Tree Species:**  
**Ponderosa Pine**

**DBH:**  
**52 in (132 cm)**

**Height:**  
**160 ft (49 m)**

**Microsite:**  
**Cavity**

**CWHR:**  
**Sierran Mixed  
Conifer 5 D  
(upslope 5 M)**

**Elevation:**  
**6800 ft (2070 m)**

NATAL DEN: Tree #482  
Live Ponderosa Pine





## **NATAL DEN**

**TREE #578**

***FEMALE FISHER***

**Structure Type:  
Conifer Snag**

**Tree Species:  
Ponderosa Pine**

**DBH:  
39in (99cm)**

**Height:  
50ft (15m)**

**Microsite:  
Cavity**

**CWHR: Montane  
Hardwood-  
Conifer 4P  
surrounded by  
tall shrubs  
(nearby area 4M)**

**Elevation:  
4200ft (1280m)**

NATAL DEN: Tree #578  
Ponderosa Pine Snag





**NATAL DEN**

**TREE #642**

***FEMALE FISHER***

**Structure Type:  
Live Hardwood**

**Tree Species:  
Canyon Live Oak**

**DBH:  
39in (98cm)**

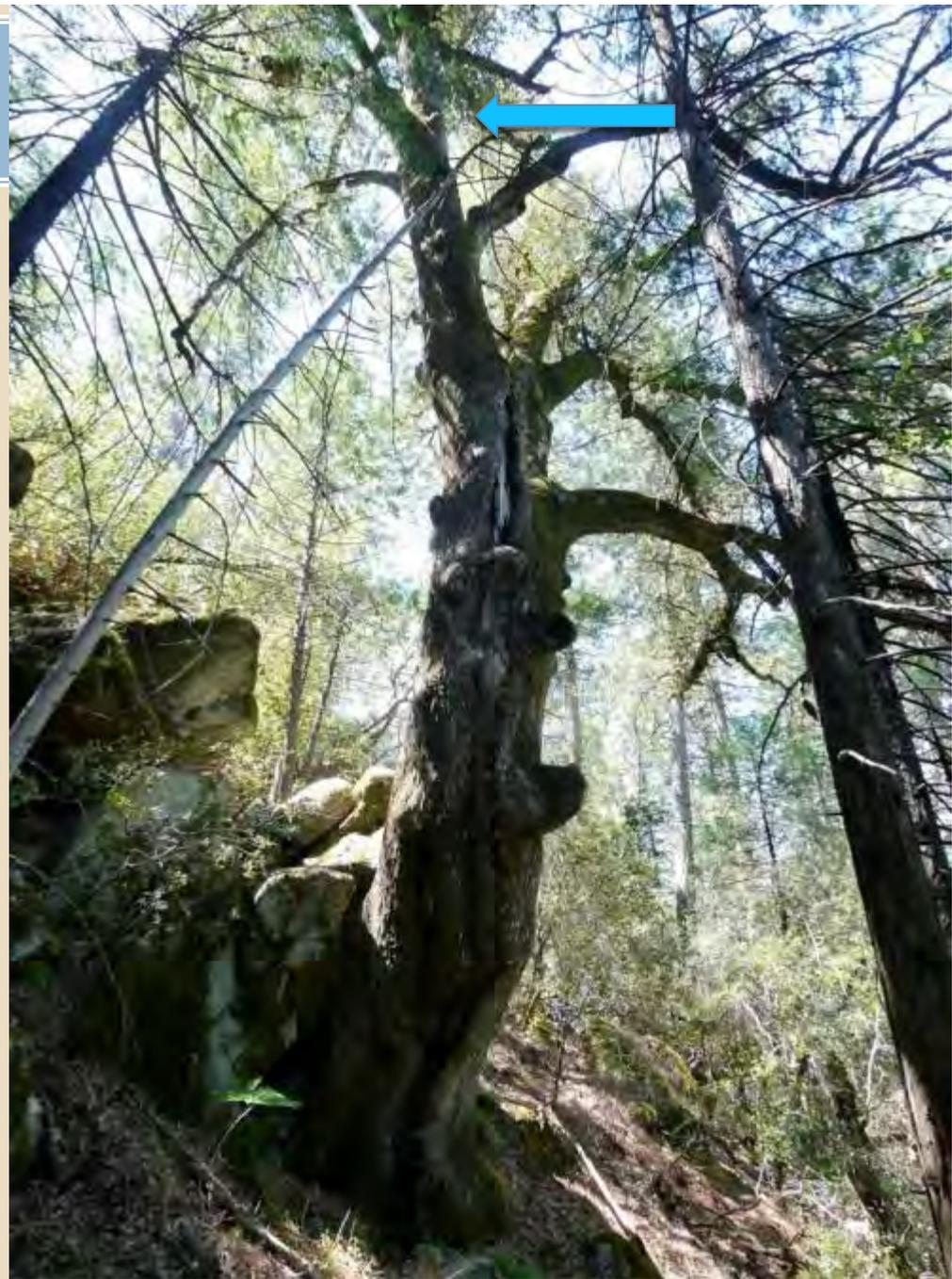
**Height:  
63ft (19m)**

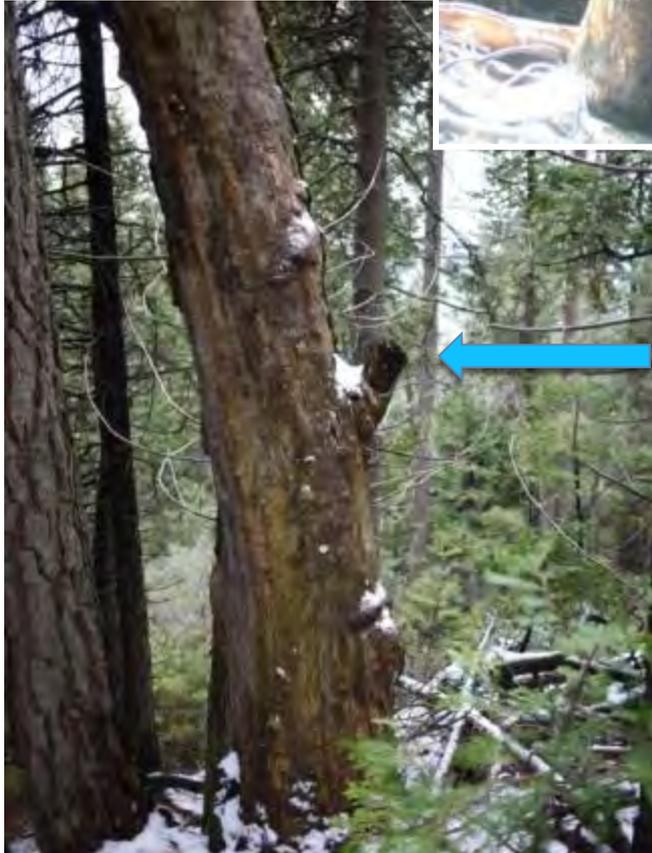
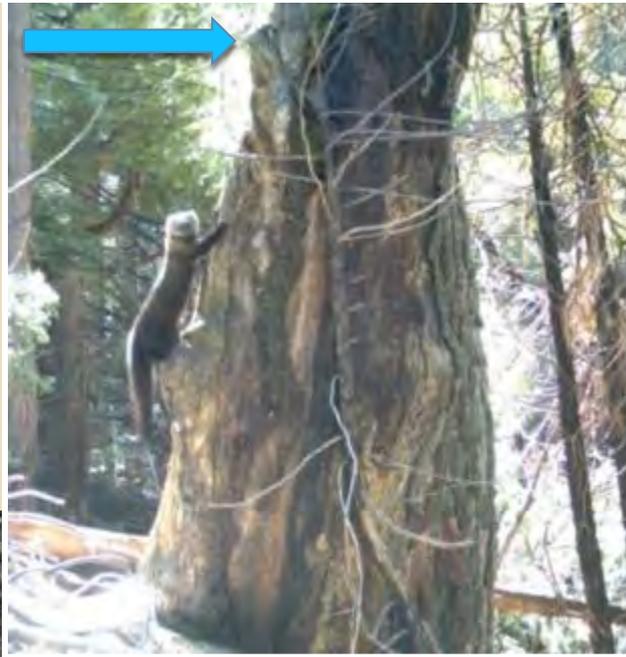
**Microsite:  
Cavity**

**CWHR:  
Sierran Mixed  
Conifer 6D**

**Elevation:  
3700ft (1130m)**

NATAL DEN: Tree #642  
Canyon Live Oak





**NATAL DEN**

**TREE #496**

**FEMALE FISHER**

**Structure Type:**  
Hardwood Snag

**Tree Species:**  
CA Black Oak

**DBH:**  
28in (71.2cm)

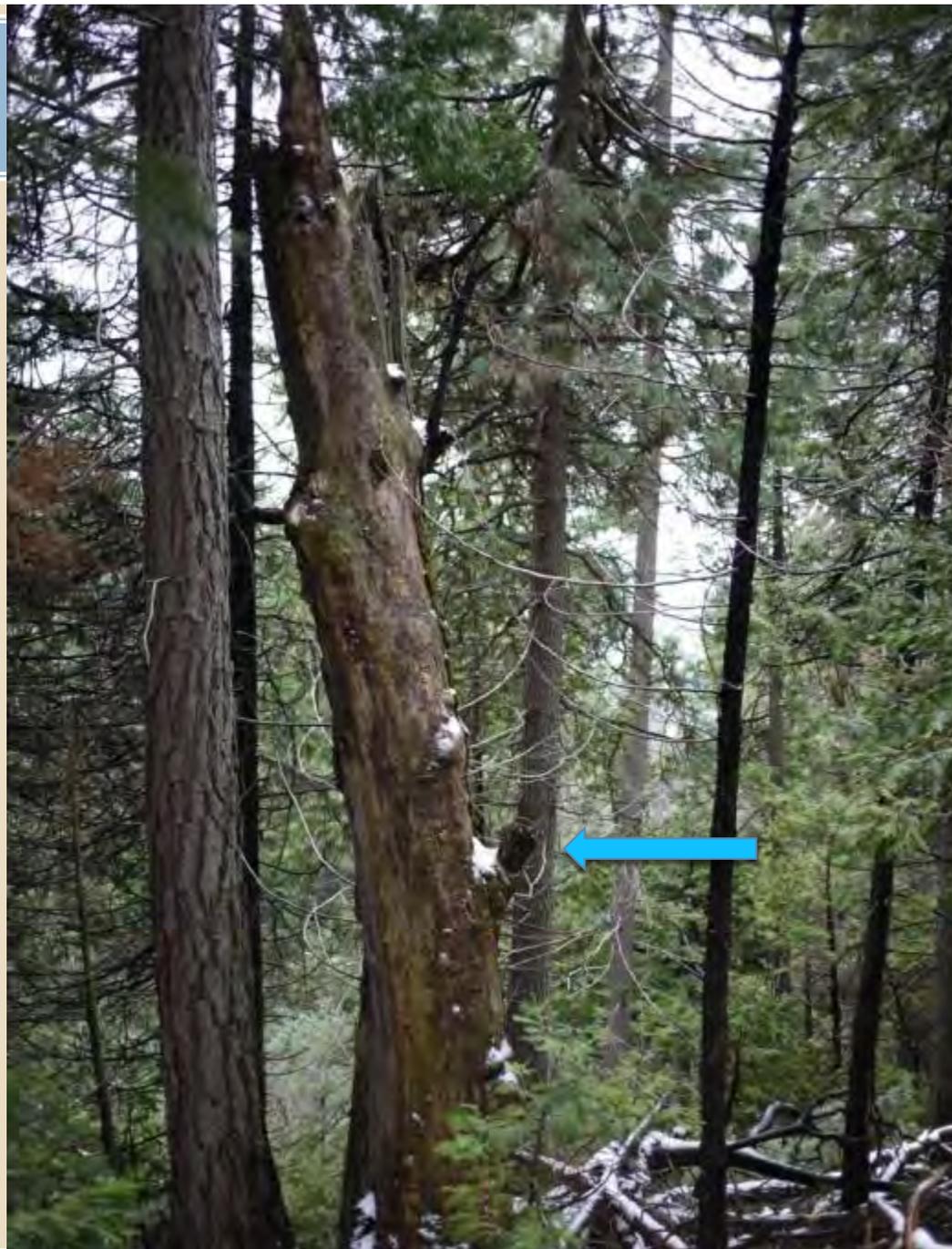
**Height:**  
18.4ft (5.6m)

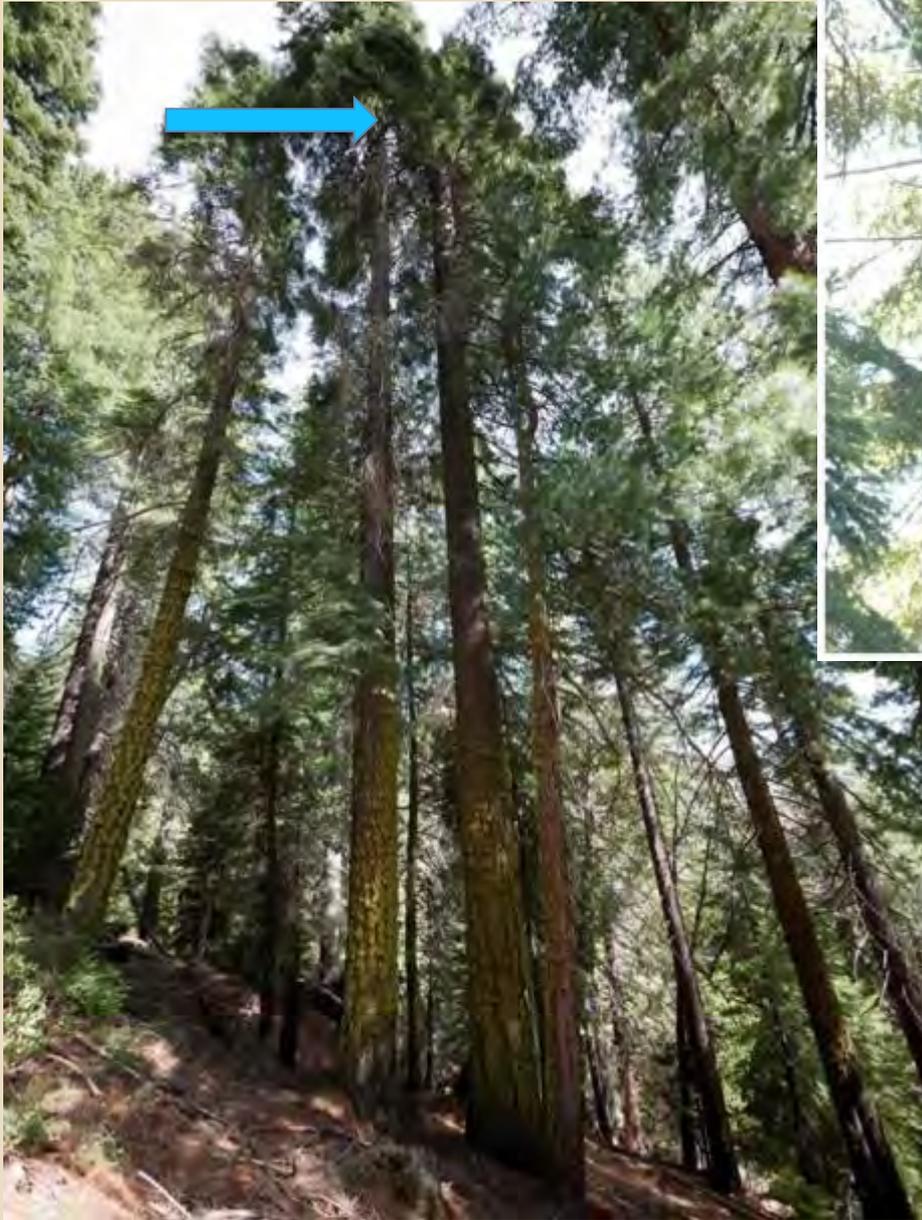
**Microsite:**  
Cavity

**CWHR:**  
Sierran Mixed  
Conifer 6D

**Elevation:**  
4900ft (1490m)

MATERNAL DEN: Tree #496  
California Black Oak Snag





**MATERNAL**

**DEN**

**TREE #802**

***FEMALE FISHER***

**Structure Type:**  
**Live Conifer**

**Tree Species:**  
**White Fir**

**DBH:**  
**40in (102cm)**

**Height:**  
**118ft (36m)**

**Microsite:**  
**Cavity**

**CWHR:**  
**Sierran Mixed  
Conifer 6D  
(close to 5M)**

**Elevation:**  
**6400ft (1950m)**

# MATERNAL DEN: Tree #802

## Live White Fir





**MATERNAL  
DEN**

**TREE #762  
FEMALE FISHER**

**Structure Type:  
Conifer Snag**

**Tree Species:  
White Fir**

**DBH:  
45in (113cm)**

**Height:  
78ft (24m)**

**Microsite:  
Cavity**

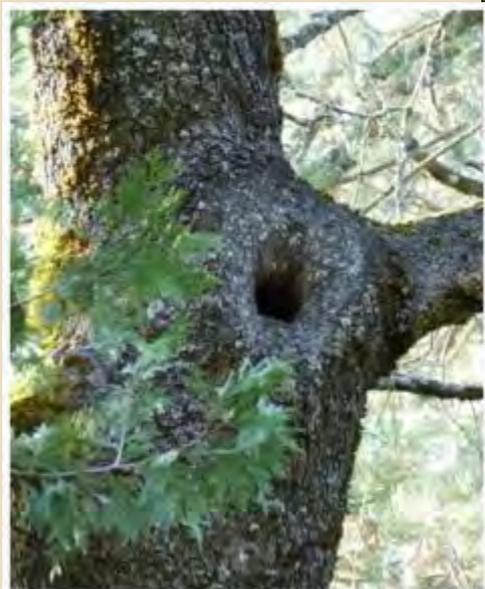
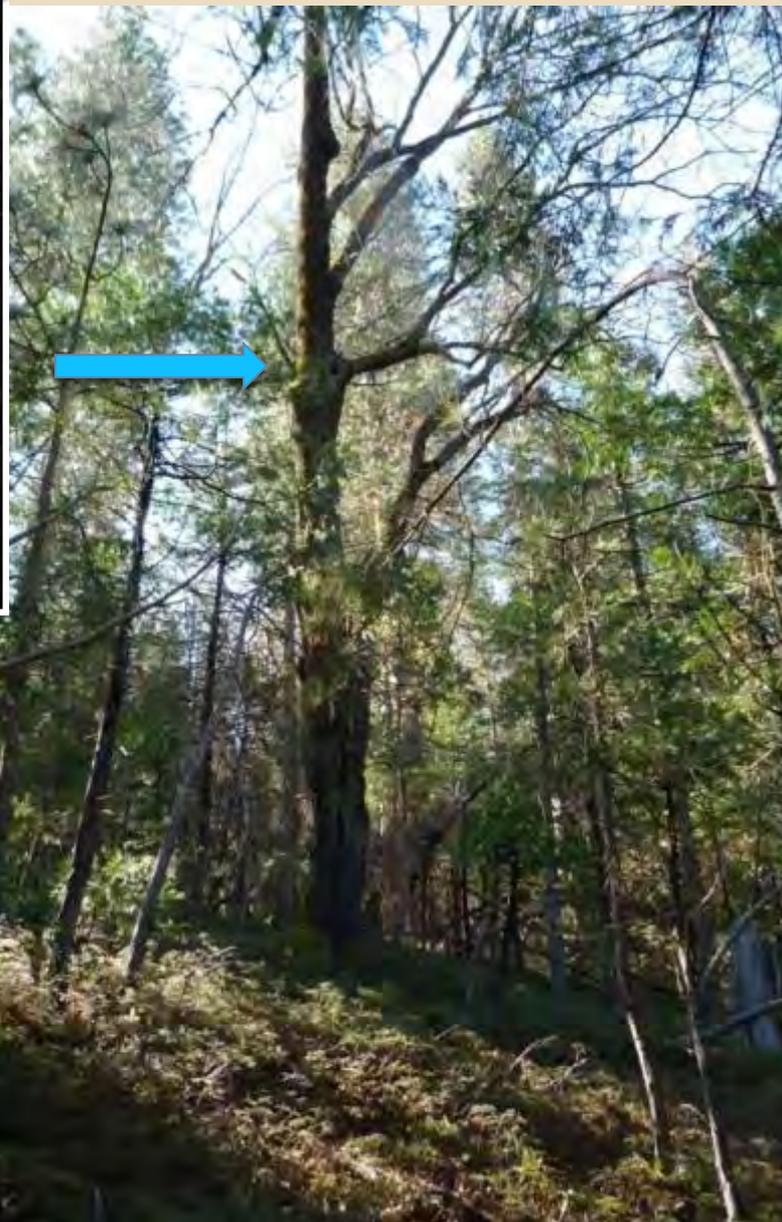
**CWHR:  
Sierran Mixed  
Conifer 5D**

**Elevation:  
5400ft (1650m)**

MATERNAL DEN: Tree # 762  
White Fir Snag



Female fisher moving young kit at night



**MATERNAL  
DEN**

**TREE #700**

**FEMALE FISHER**

**Structure Type:  
Live Hardwood**

**Tree Species:  
CA Black Oak**

**DBH:  
31 in (78cm)**

**Height:  
92ft (28m)**

**Microsite:  
Cavity**

**CWHR:  
Sierran Mixed  
Conifer 5D**

**Elevation:  
3700ft (1130m)**

MATERNAL DEN: Tree #700  
Live California Black Oak





Female moved young kit  
out of snag then along  
neighboring black oak limb  
and down to ground



**MATERNAL  
DEN**

**TREE #391**

**FEMALE FISHER**

**Structure Type:  
Conifer Snag**

**Tree Species:  
Ponderosa Pine**

**DBH:  
38in (97cm)**

**Height:  
29ft (9m)**

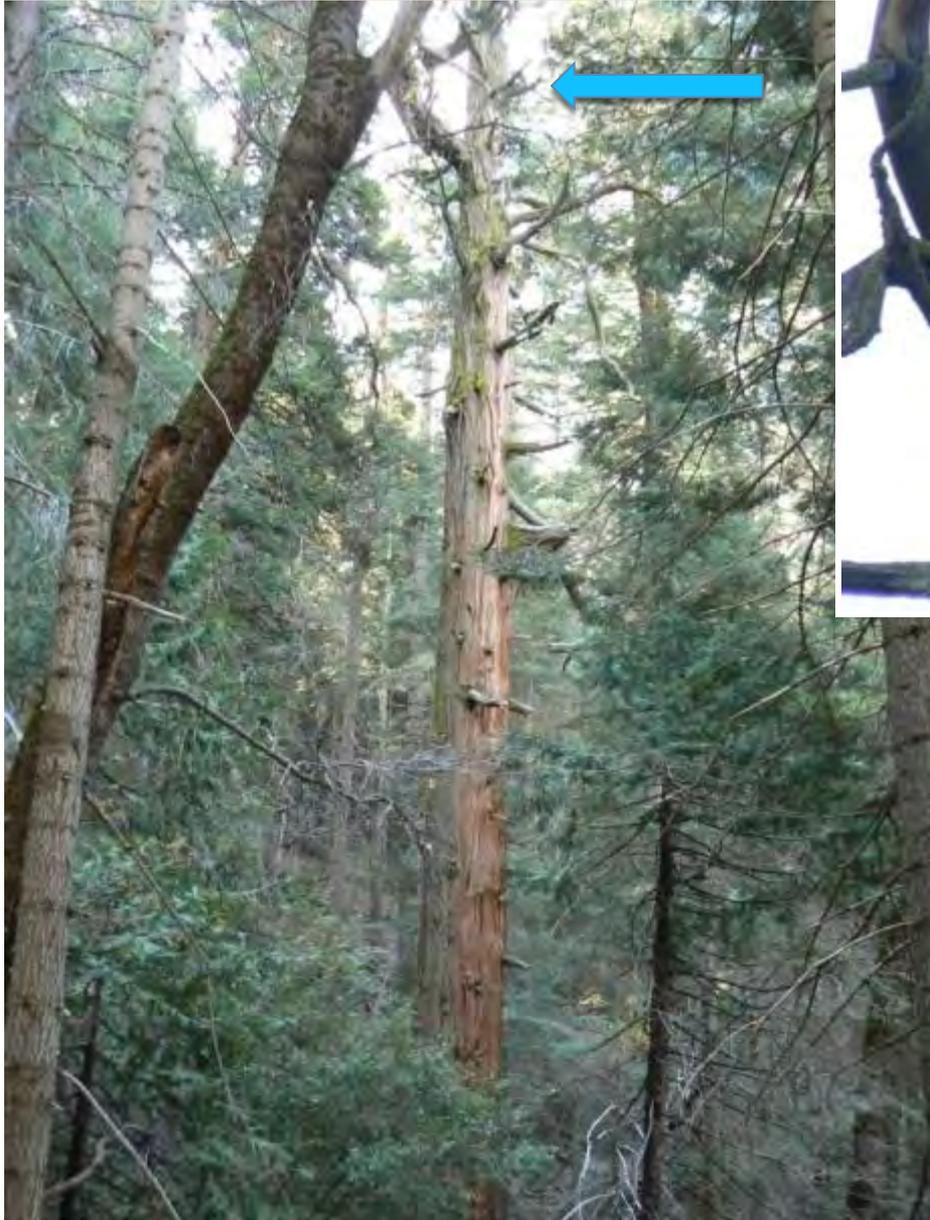
**Microsite:  
Cavity**

**CWHR:  
Sierran Mixed  
Conifer 4M**

**Elevation:  
5500ft (1680m)**

MATERNAL DEN: Tree #391  
Ponderosa Pine Snag





**MATERNAL  
DEN**

**TREE #971  
FEMALE FISHER**

Structure Type:  
Conifer Snag

Tree Species:  
Incense Cedar

DBH:  
58.5in (148.5cm)

Height:  
120.1ft (36.6m)

Microsite:  
Cavity

CWHR:  
Sierran Mixed  
Conifer 6D

Elevation:  
4800ft (1460m)

MATERNAL DEN :Tree #97 I  
Incense Cedar Snag



# REST SITES





## **REST SITE**

**TREE #256**

**FEMALE FISHER**

**Structure Type:  
Live Hardwood**

**Tree Species:  
CA Black Oak**

**DBH:  
27in (68cm)**

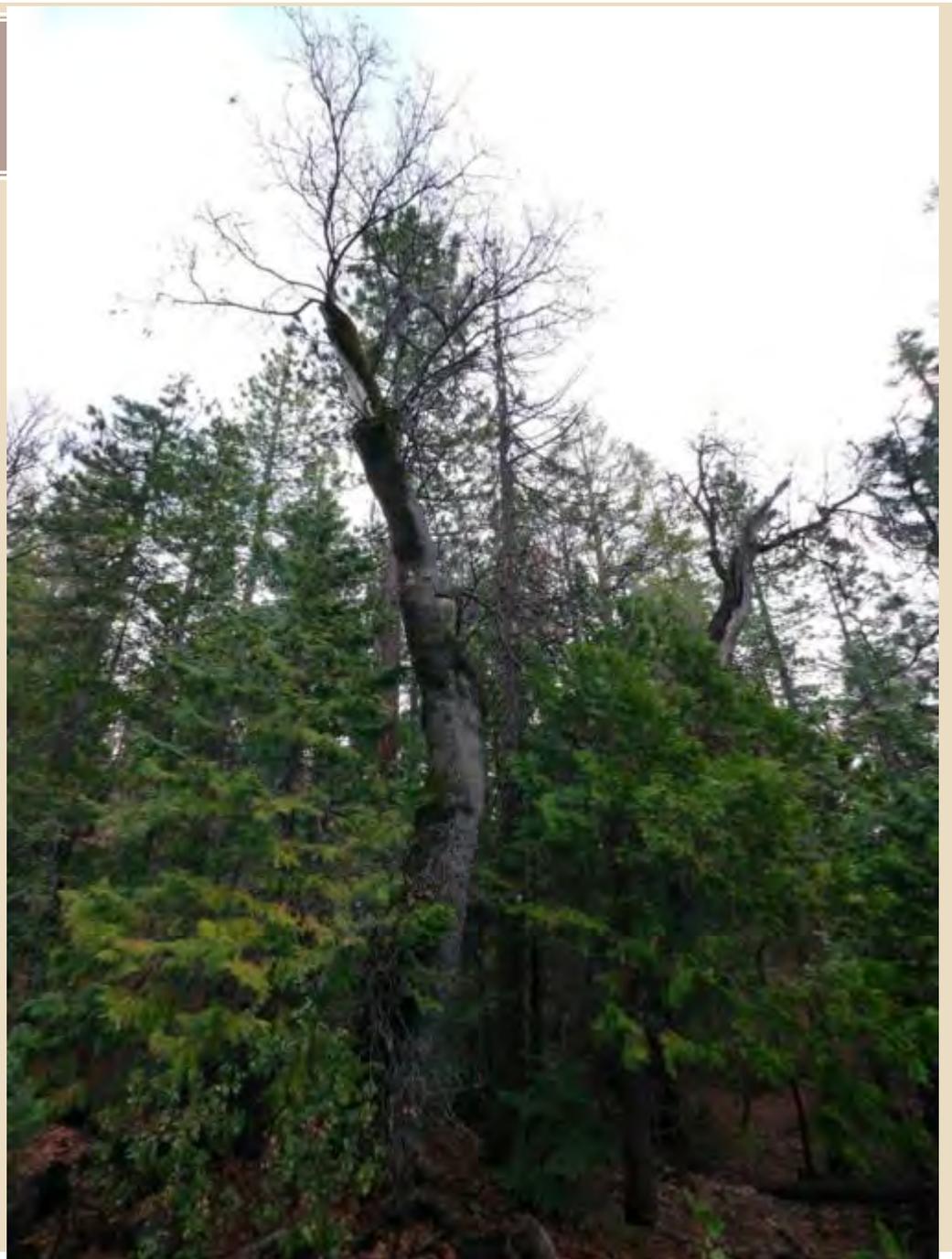
**Height:  
46ft (14m)**

**Microsite: Cavity  
in broken trunk**

**CWHR:  
Sierran Mixed  
Conifer 4M**

**Elevation:  
5800ft (1770m)**

REST SITE: Tree #256  
Live California Black Oak





## **REST SITE**

**TREE #637**

**FEMALE FISHER**

**Structure Type:  
Live Hardwood**

**Tree Species:  
CA Black Oak**

**DBH:  
29in (74cm)**

**Height:  
68ft (21m)**

**Microsite:  
Cavity**

**CWHR:  
Sierran Mixed  
Conifer 4D**

**Elevation: 4500ft  
(1370m)**

REST SITE: Tree #637  
Live California Black Oak





## **REST SITE**

**TREE #593**

**MALE FISHER**

**Structure Type:**

**Live Conifer**

**Tree Species:**

**White Fir**

**DBH:**

**73in (185cm)**

**Height:**

**138ft (42m)**

**Microsite:**

**Large limb/broken  
fork**

**CWHR: Sierran  
Mixed Conifer 6D  
(on an edge of P  
canopy)**

**Elevation:**

**5800ft (1770m)**

REST SITE: Tree #593  
Live White Fir





**REST SITE**  
**TREE #1018**  
**MALE FISHER**

**Structure Type:**  
**Live Conifer**

**Tree Species:**  
**Ponderosa Pine**

**DBH:**  
**35in (89cm)**

**Height:**  
**157ft (48m)**

**Microsite: Branch  
cluster/needle  
clump**

**CWHR:**  
**Sierran Mixed  
Conifer 6D**

**Elevation:**  
**3600ft (1100m)**

REST SITE: Tree #1018  
Live Ponderosa Pine





**REST SITE**

**TREE #435**

***FEMALE FISHER***

**Structure Type:**

**Live Conifer**

**Tree Species:**

**Sugar Pine**

**DBH:**

**59in (150cm)**

**Height:**

**182ft (56m)**

**Microsite:**

**Mistletoe/branch  
cluster**

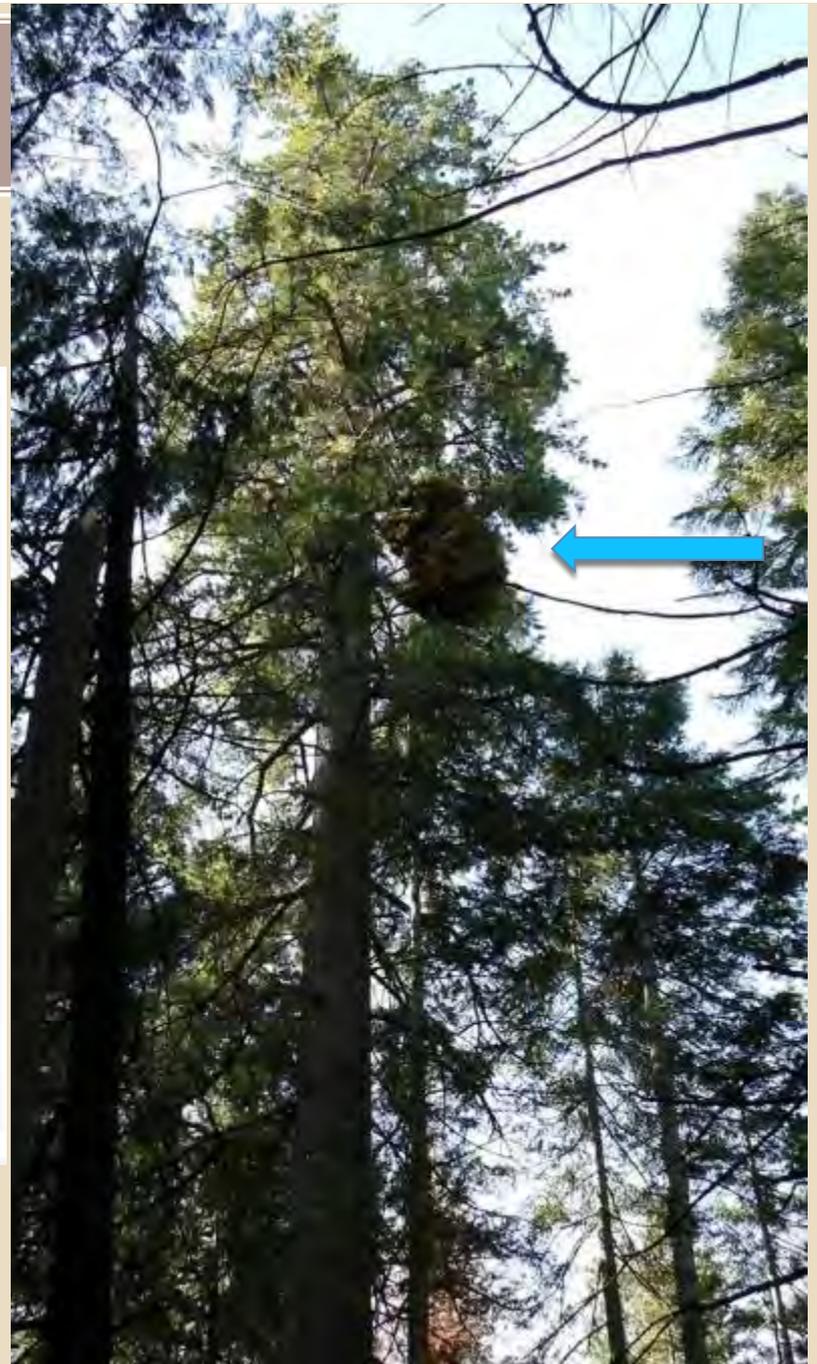
**CWHR:**

**Sierran Mixed  
Conifer 4M**

**Elevation:**

**4400ft (1340m)**

REST SITE: Tree #435  
Live Sugar Pine





**REST SITE**  
**TREE #197**  
**FEMALE FISHER**

Structure Type:  
Live Conifer

Tree Species:  
Ponderosa Pine

DBH:  
22in (57cm)

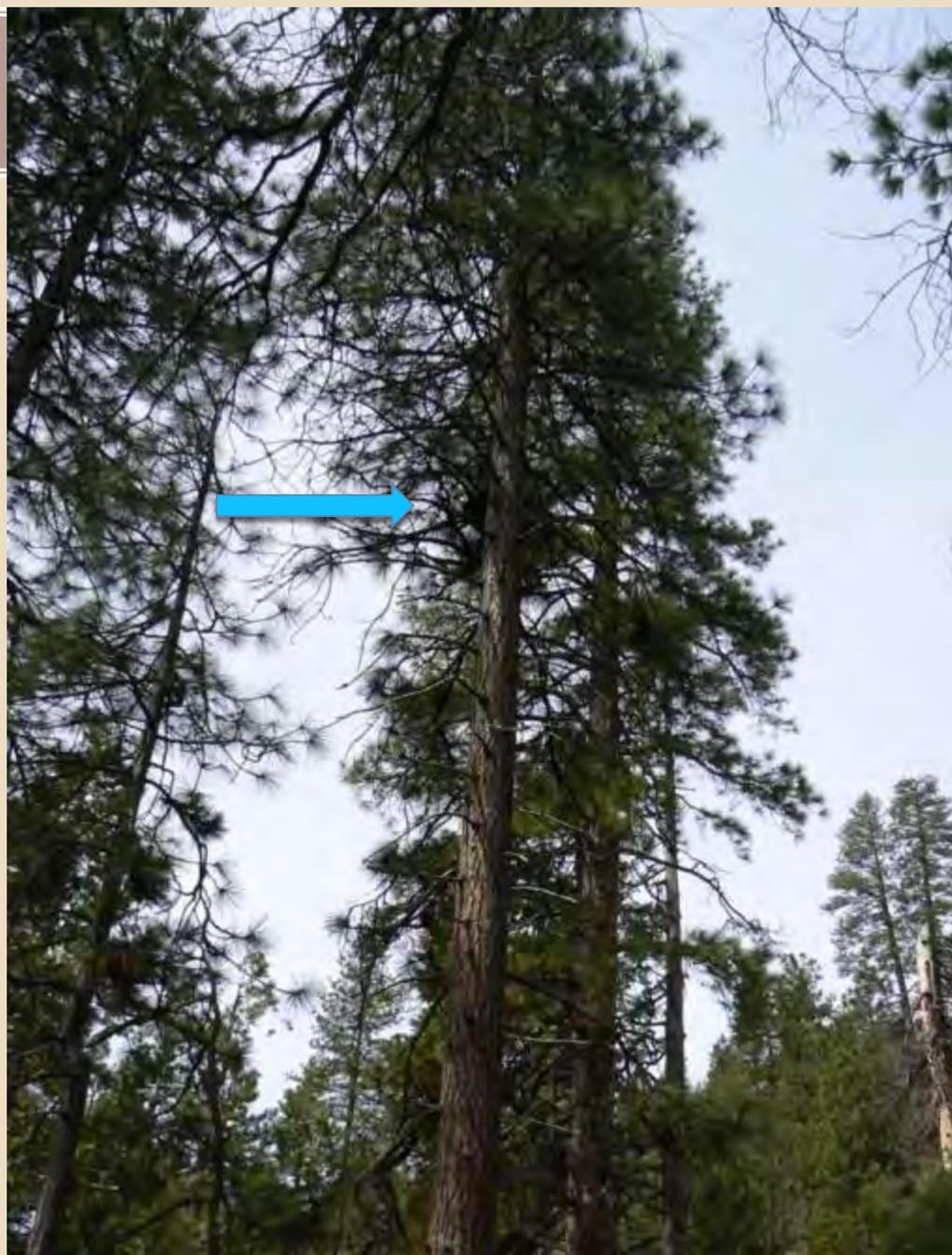
Height:  
75ft (23m)

Microsite:  
Stick/pine needle  
nest

CWHR:  
Ponderosa Pine  
(patchy 3P and  
4M)

Elevation:  
4800ft (1460m)

REST SITE: Tree #197  
Live Ponderosa Pine





## **REST SITE**

**TREE #776**

***FEMALE FISHER***

**Structure Type:  
Conifer Snag**

**Tree Species:  
Incense Cedar**

**DBH:  
54in (136cm)**

**Height:  
102ft (31m)**

**Microsite:  
Cavity created  
by woodpecker**

**CWHR:  
Sierran Mixed  
Conifer 6D (in  
riparian area)**

**Elevation:  
4800ft (1460m)**



REST SITE: Tree #776  
Incense Cedar Snag





## **REST SITE**

**TREE #518**

**FEMALE FISHER**

**Structure Type:**

**Conifer Snag**

**Tree Species:**

**White Fir**

**DBH:**

**36in (92cm)**

**Height:**

**48ft (15m)**

**Microsite:**

**Cavity/broken top**

**CWHR:**

**White Fir 4D**

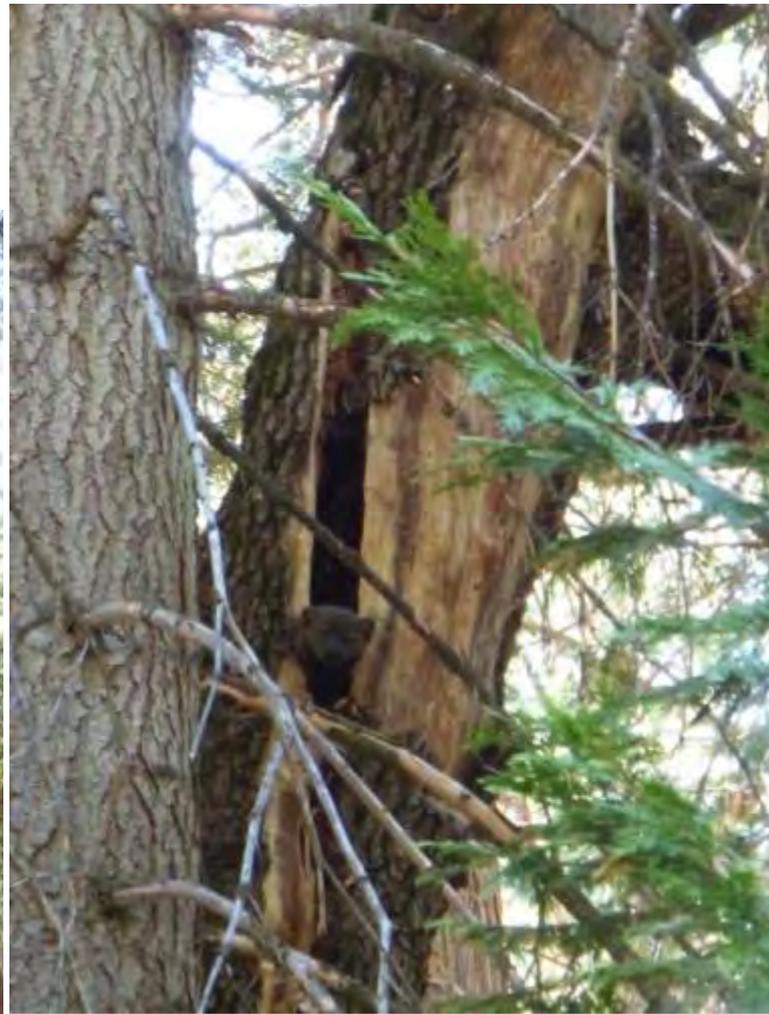
**Elevation:**

**5300ft (1620m)**

REST SITE: Tree #518  
White Fir Snag



Female fisher had been taking a nap on platform inside split near broken top



## **REST SITE**

**TREE #1094**

**MALE FISHER**

**Structure Type:**  
**Hardwood Snag**

**Tree Species:**  
**CA Black Oak**

**DBH:**  
**29.7in (75.5cm)**

**Height:**  
**60.7ft (18.5m)**

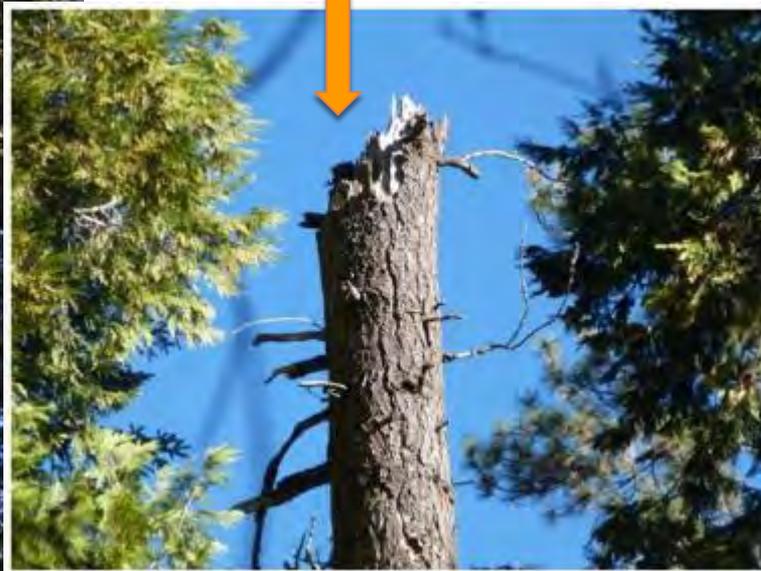
**Microsite:**  
**Cavity accessed  
by split in trunk**

**CWHR:**  
**Sierran Mixed  
Conifer 5D**

**Elevation:**  
**6300ft (1920m)**

REST SITE: Tree #1094  
California Black Oak Snag





## **REST SITE**

**TREE #539**

***FEMALE FISHER***

**Structure Type:  
Conifer Snag**

**Tree Species:  
White Fir**

**DBH:  
45in (114cm)**

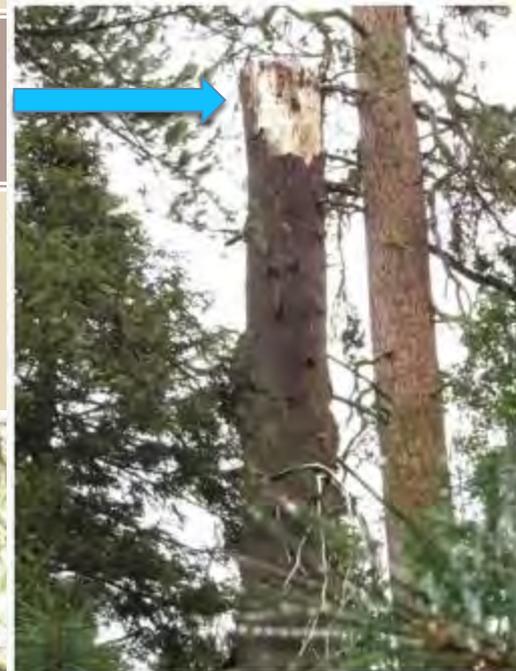
**Height:  
77ft (24m)**

**Microsite:  
Broken Top**

**CWHR:  
Sierran Mixed  
Conifer 6D**

**Elevation:  
4500ft (1370m)**

REST SITE: Tree #539  
White Fir Snag





**REST SITE**

**TREE #177**

**MALE FISHER**

**Structure Type:**

**Conifer Snag**

**Tree Species:**

**Sugar Pine**

**DBH:**

**68.9in (175cm)**

**Height:**

**33.5ft (10.2m)**

**Microsite:**

**Cavity/Broken Top**

**CWHR:**

**Sierran Mixed  
Conifer 5D  
(including Red Fir)**

**Elevation:**

**7000ft (2130m)**

REST SITE: Tree #177  
Sugar Pine Snag





Note that female was photographed here, but when the rest site was initially located she was resting inside the snag which is mostly hollow. We suspect her kit was inside the cavity with her.

**REST SITE**

**TREE #1106**  
**FEMALE FISHER**

**Structure Type:**  
**Hardwood Snag**

**Tree Species:**  
**CA Black Oak**

**DBH:**  
**22in (57cm)**

**Height:**  
**41ft (12m)**

**Microsite:**  
**Cavity**

**CWHR:**  
**Sierran Mixed  
Conifer 4D**

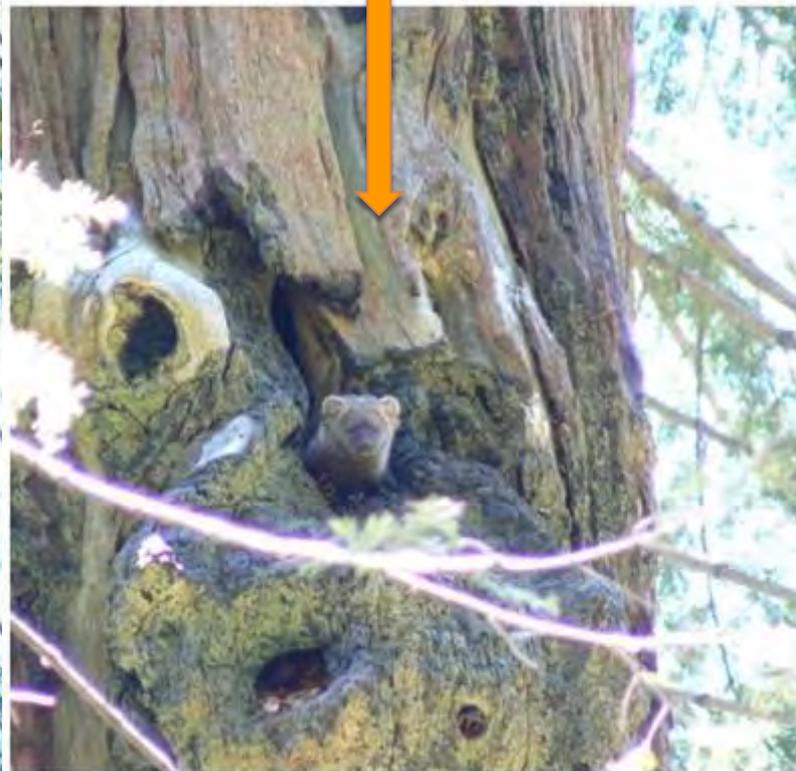
**Elevation:**  
**4900ft (1490m)**

REST SITE: Tree #1106  
California Black Oak Snag





Adult female fisher poking  
head out of cavity



Fisher kit/juvenile poking  
head out of same cavity

## **REST SITE**

**TREE #277**

**FEMALE W/ KIT**

**Structure Type:**  
**Conifer Snag**

**Tree Species:**  
**Incense Cedar**

**DBH:**  
**78in (199cm)**

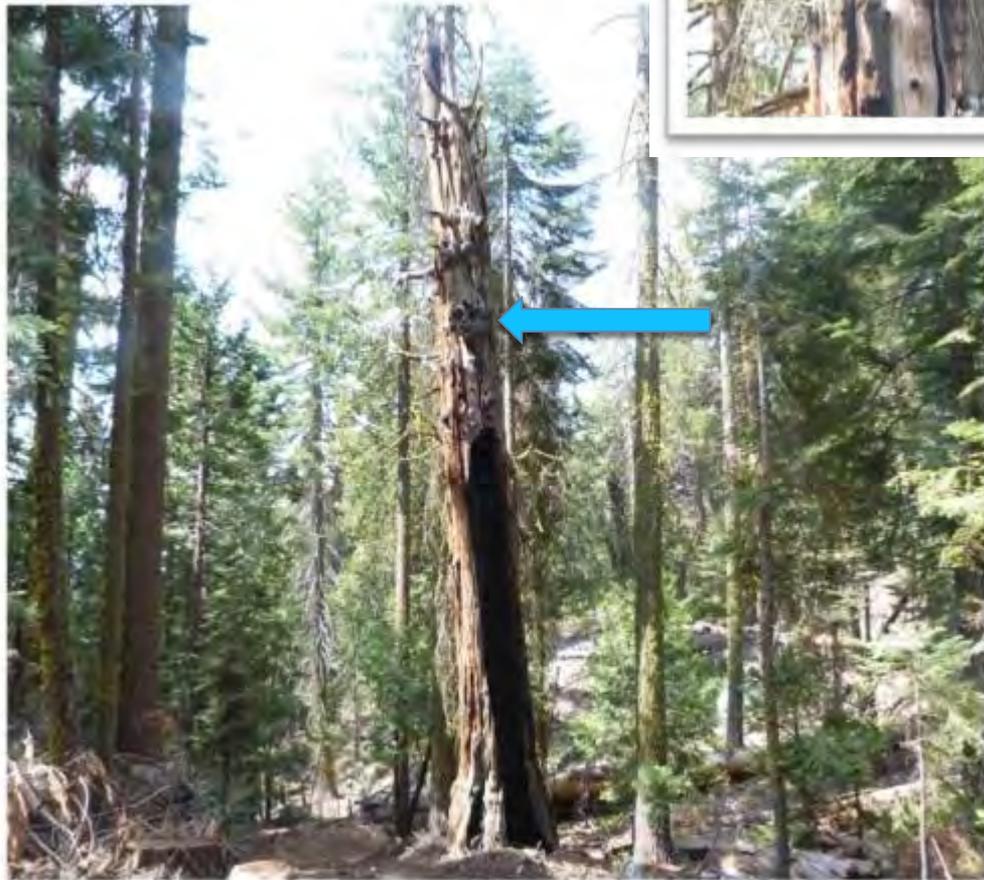
**Height:**  
**60ft (18.2m)**

**Microsite:**  
**Cavity**

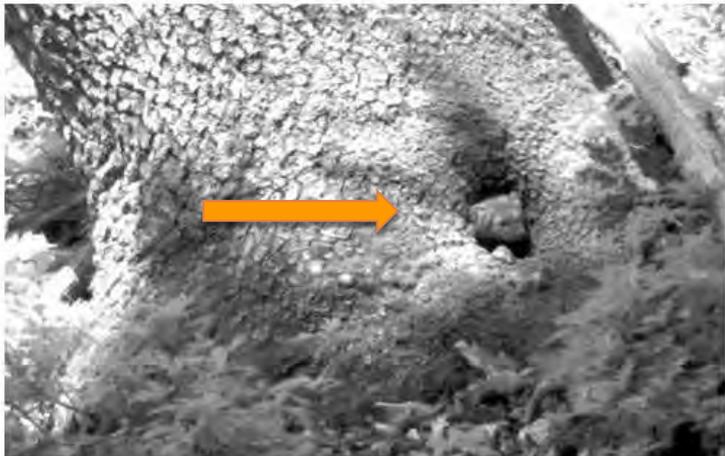
**CWHR:**  
**Sierran Mixed  
Conifer 6D**

**Elevation:**  
**6400ft (1950m)**

REST SITE: Tree #277  
Incense Cedar Snag



Note the photo above was taken after a management treatment



## **REST SITE**

**TREE #780**

***FEMALE W/ KIT***

**Structure Type:**  
**Live Hardwood**

**Tree Species:**  
**CA Black Oak**

**DBH:**  
**28in (71cm)**

**Height:**  
**46ft (14m)**

**Microsite:**  
**Cavity**

**CWHR:**  
**Sierran Mixed  
Conifer 6D**

**Elevation:**  
**5500ft (1680m)**

REST SITE: Tree #780  
Live California Black Oak





## **REST SITE**

**TREE #722**

**FEMALE WI KITS**

**Structure Type:**  
**Hardwood Log**

**Tree Species:**  
**25in (63cm)**

**DBH:**  
**57ft (17m)**

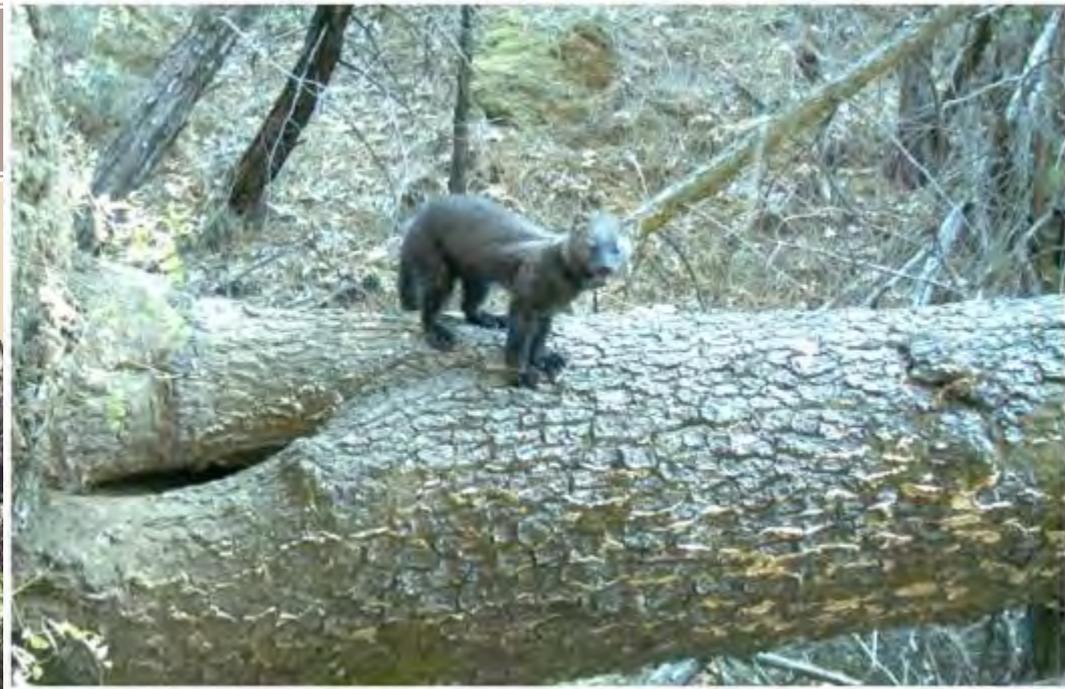
**Length:**  
**57ft (17m)**

**Microsite:**  
**Cavity**

**CWHR: Montane  
Hardwood  
Conifer 4M**

**Elevation:**  
**3800ft (1160m)**

REST SITE: Tree #722  
California Black Oak Log





## **REST SITE**

**TREE #131**

**FEMALE W/ KITS**

**Structure Type:**  
**Conifer Log**

**Tree Species:**  
**Incense Cedar**

**DBH:**  
**31 in (79cm)**

**Height:**  
**75ft (23m)**

**Microsite:**  
**Cavity**

**CWHR:**  
**Sierran Mixed  
Conifer 6D**

**Elevation:**  
**4800ft (1460m)**

REST SITE: Tree #131  
Incense Cedar Log



## What tree species are used as Natal and Maternal Dens?



- Between 2008 and 2014, natal and maternal dens were located on the Kings River fisher project by following radio-collared females each spring during reproduction. The figures on the right show the proportion of tree species used as natal and maternal reproductive dens, as well as live trees used relative to snags.
- Over half of all natal and maternal dens have been in California black oaks, with the majority of those in live trees. Other tree species used by female fishers as dens include white fir, incense cedar, ponderosa pine, sugar pine, and canyon live oak.
- Females used both live trees and snags, but tended to use a higher proportion of live trees as natal dens compared with maternal dens.

Figure 1. Proportion of tree species used as dens by fishers.

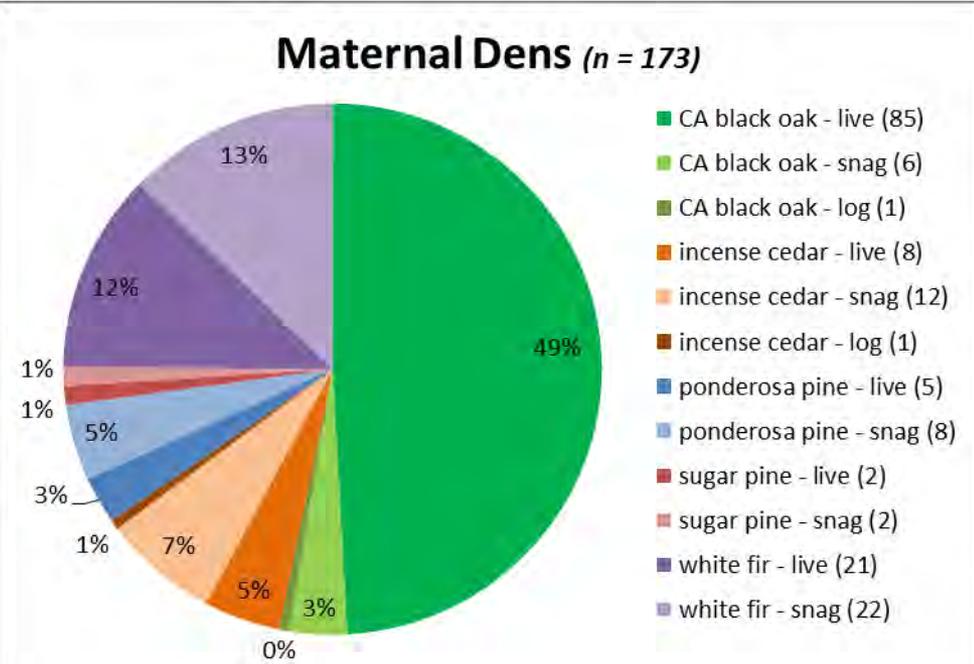
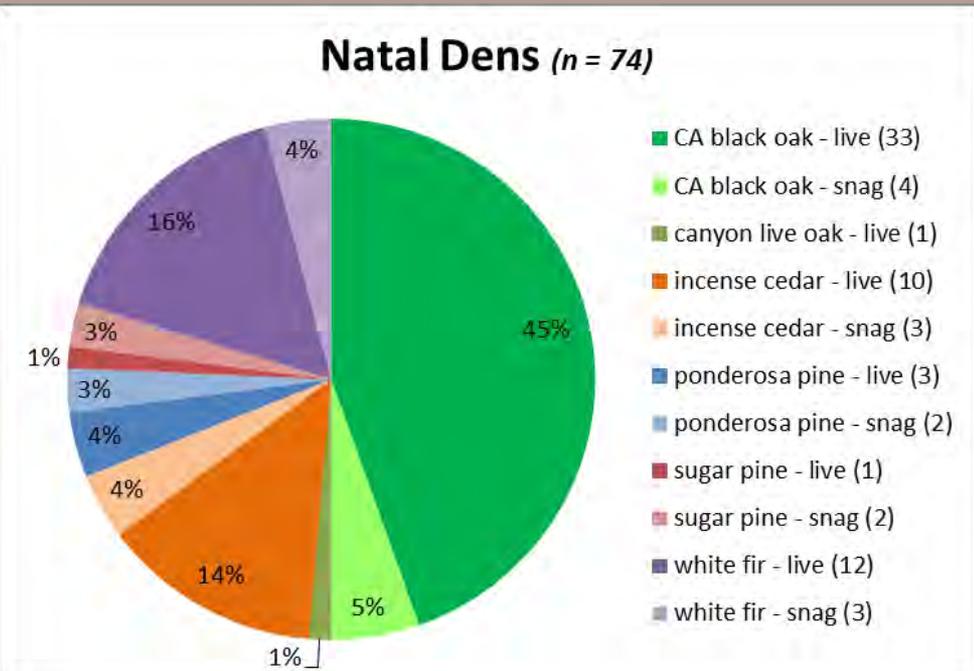


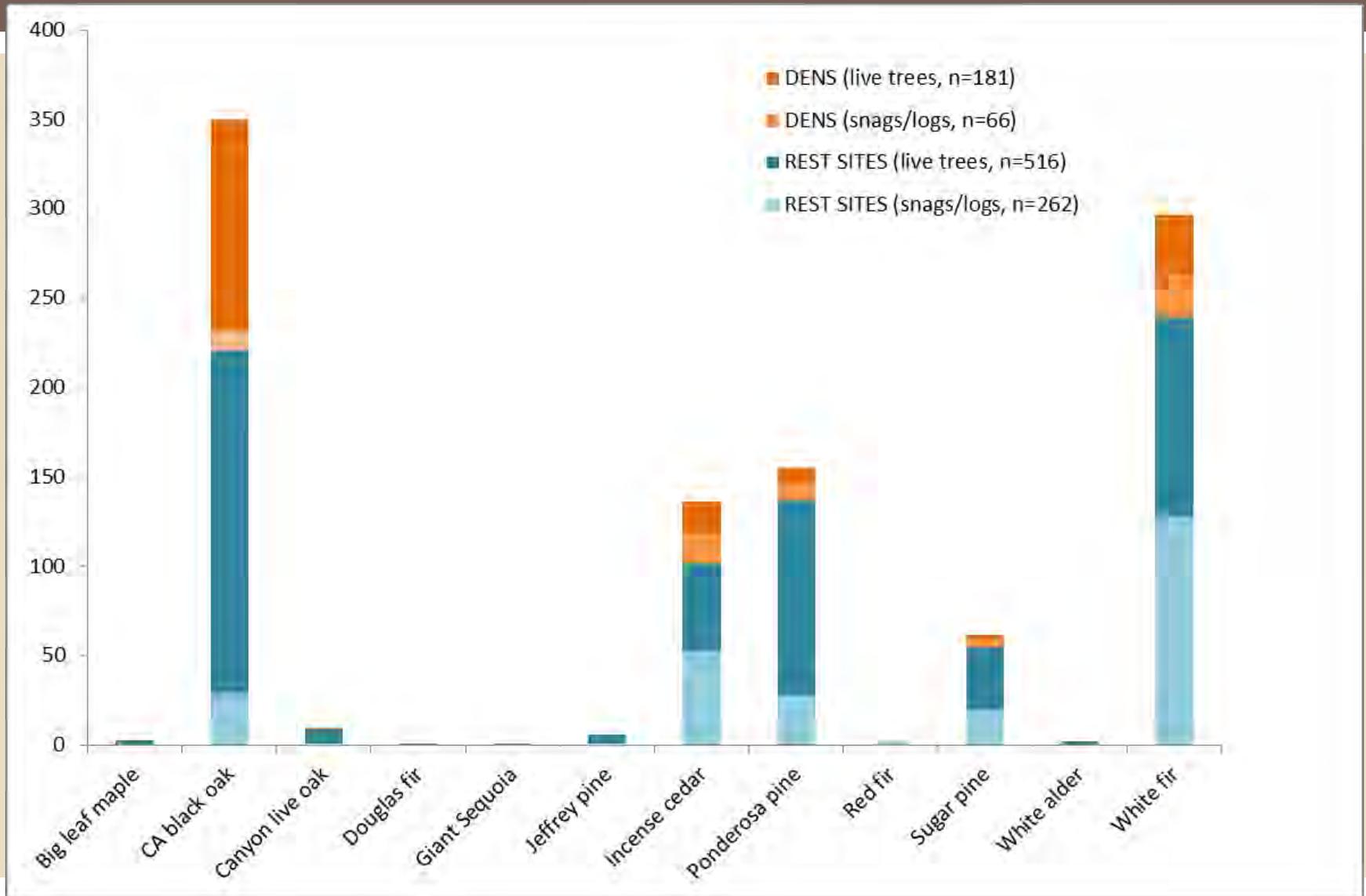
Table 1. Summary of diameter at breast height (dbh) measures for a sampling of natal den, maternal den, and rest structures used by fishers in the Kings River study area. (Note units are in **centimeters**).

<b>TREE SPECIES and TYPE</b>	<b>NATAL DEN mean dbh ± st dev (cm)</b>	<b>MATERNAL DEN mean dbh ± st dev (cm)</b>	<b>REST SITE mean dbh ± st dev (cm)</b>
CA black oak - live	79.4 (±26.5)	75.3 (±19.4)	78.4 (±20.5)
CA black oak - snag	65.6 (±6.7)	73.9 (±16.1)	81.2 (±25.0)
CA black oak - log	---	65	57.6 (±12.1)
Canyon live oak - live	98	---	66 (±12.1)
Giant Sequoia - log	---	---	323.0
Jeffrey pine - live	---	---	107 (±19.6)
Incense cedar - live	128.3 (±18.8)	113.9 (±24.9)	117.3 (±32.4)
Incense cedar - snag	88.3 (±18.4)	103.9 (±24.6)	106.0 (±35.9)
Incense cedar - log	---	121.9	88.4 (±31.8)
Ponderosa pine - live	103.25 (±40.1)	97.4 (±34.2)	87.0 (±30.5)
Ponderosa pine - snag	98.6 (±0)	104.0 (±34.6)	98.6 (±30.8)
Ponderosa pine - log	---	---	101.7 (±44.3)
Sugar pine - live	128.3	133.4	105.6 (±41.0)
Sugar pine - snag	158.25 (±16.2)	118.6 (±65.6)	149.2 (±32.7)
Sugar pine - log	---	---	180.0
White fir - live	100.58 (±23.5)	104.9 (±18.7)	87.1 (±33.5)
White fir - snag	98.3 (±35.8)	101.84 (±28.7)	106.3 (±31.8)
White fir - log	---	---	91.9 (±33.4)

Table 2. Summary of diameter at breast height (dbh) measures for a sampling of natal den, maternal den, and rest structures used by fishers in the Kings River study area. (Note units are in ***inches***).

<b><i>TREE SPECIES and TYPE</i></b>	<b><i>NATAL DEN mean dbh ± st dev (in)</i></b>	<b><i>MATERNAL DEN mean dbh ± st dev (in)</i></b>	<b><i>REST SITE mean dbh ± st dev (in)</i></b>
CA black oak - live	31.3 (± 10.4)	29.6 (± 7.6)	30.9 (± 8.1)
CA black oak - snag	25.8 (± 2.6)	29.1 (± 6.3)	32.0 (± 9.8)
CA black oak - log	---	25.6	22.7 (± 4.8)
Canyon live oak - live	38.6	---	26.0 (± 4.8)
Giant Sequoia - log	---	---	127.2
Jeffrey pine - live	---	---	42.1 (± 7.7)
Incense cedar - live	50.5 (± 7.4)	113.9 (± 9.8)	46.2 (± 12.8)
Incense cedar - snag	34.8 (± 7.2)	40.9 (± 9.7)	41.7 (± 14.1)
Incense cedar - log	---	48	34.8 (± 12.5)
Ponderosa pine - live	40.6 (± 15.8)	38.3 (± 13.5)	34.2 (± 12.0)
Ponderosa pine - snag	38.8	40.9 (± 13.6)	38.8 (± 12.1)
Ponderosa pine - log	---	---	40.0 (± 17.4)
Sugar pine - live	50.5	52.5	41.6 (± 16.1)
Sugar pine - snag	62.3 (± 6.4)	46.7 (± 25.8)	58.7 (± 12.8)
Sugar pine - log	---	---	70.9
White fir - live	39.6 (± 9.3)	41.3 (± 7.4)	34.3 (± 13.2)
White fir - snag	38.7 (± 14.1)	40.1 (± 11.3)	41.9 (± 12.6)
White fir - log	---	---	36.2 (± 13.5)

Figure 2. Summary of den and rest sites used by fishers on the Kings River study (2007-2014) by tree species and whether the tree was live or dead (either snag or log).



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Questions or helpful comments?

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