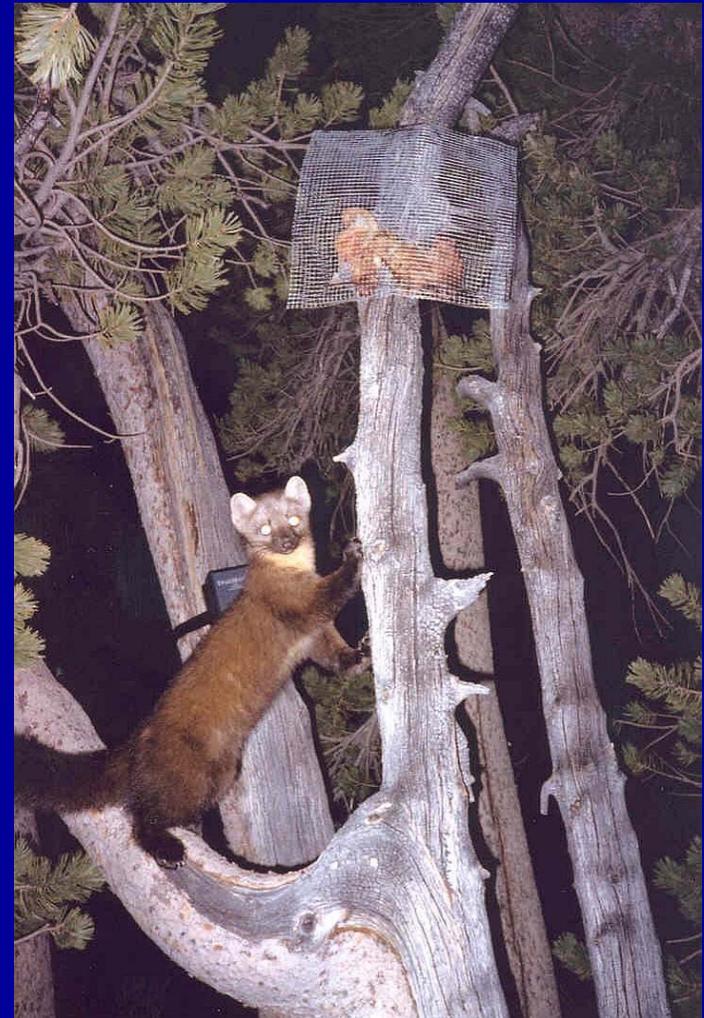


Interactions Between Fishers and Martens in California and Implications for their Conservation.



**William Zielinski, Janet Werren,
Thomas Kirk and Keith Slauson**

USDA Forest Service, Pacific Southwest
Research Station, Arcata, CA



Community Ecology Theory:

Phylogenetic Similarity ~ Ecological Similarity

Martes — *M. americana*
 — *M. pennanti*

Competition for food
and other resources
expected to be
significant

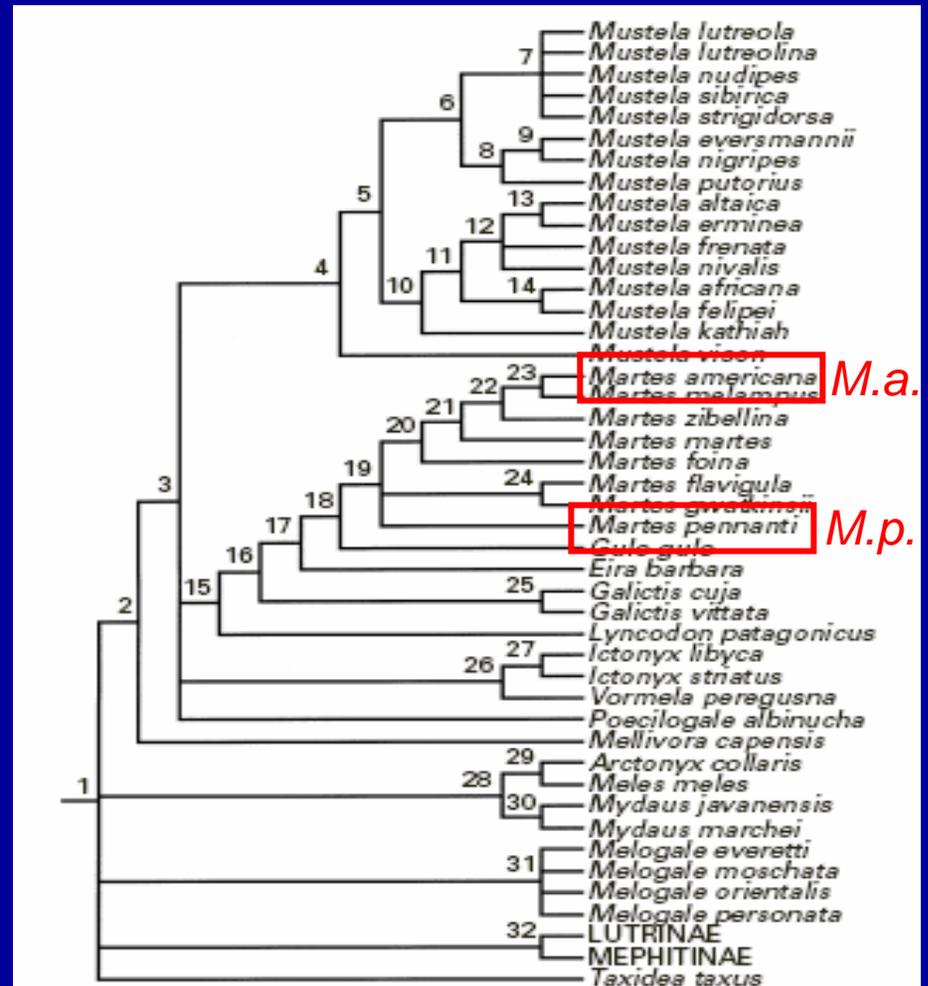


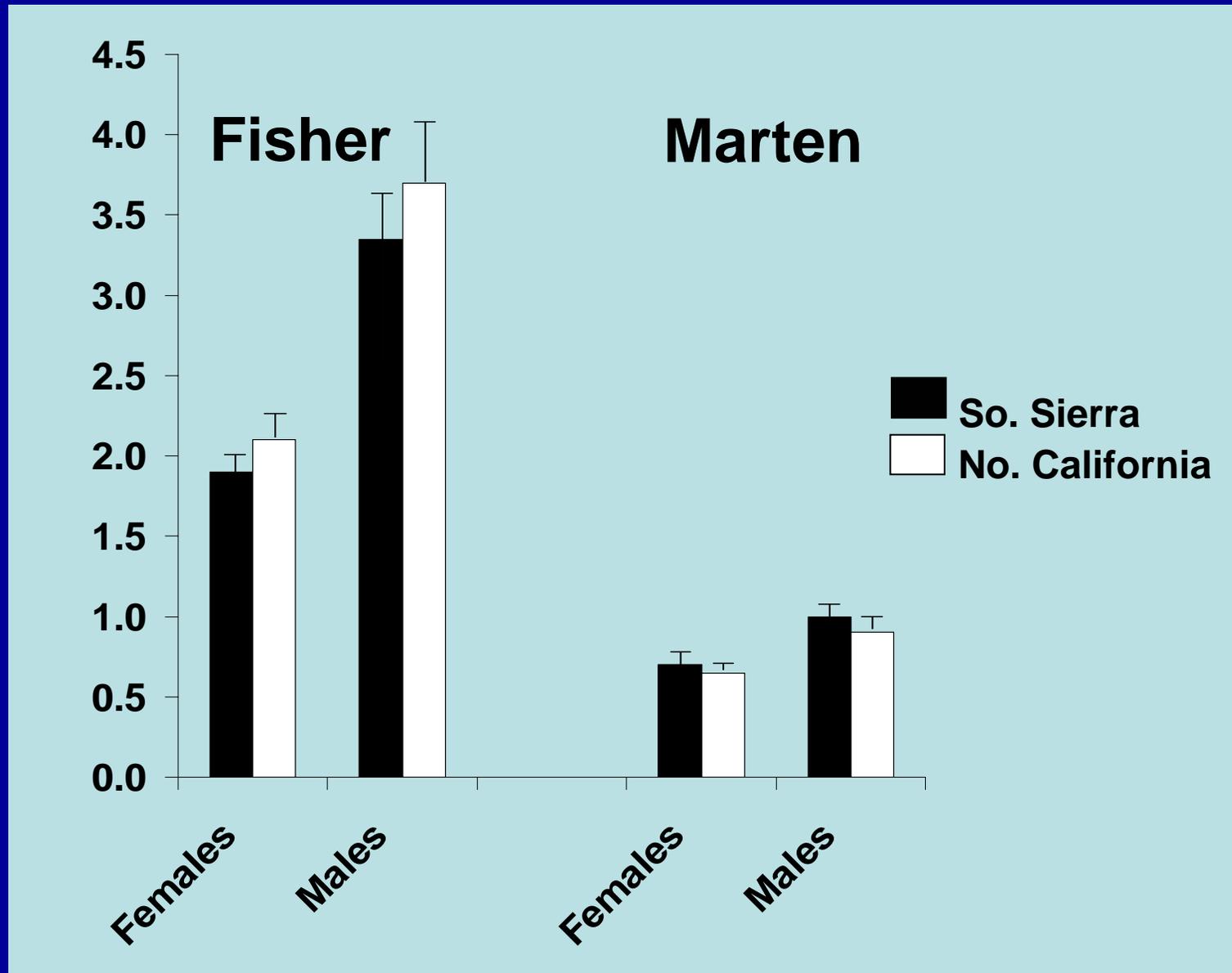
Fig. 2. The composite tree for Mustelidae (exclusive of Lutrinae and Mephitinae). Node numbers refer to Table 3, other details are as in Fig. 1.

Bininda-Emonds et al. (1999)

Negative Fisher - Marten Interactions: the Literature

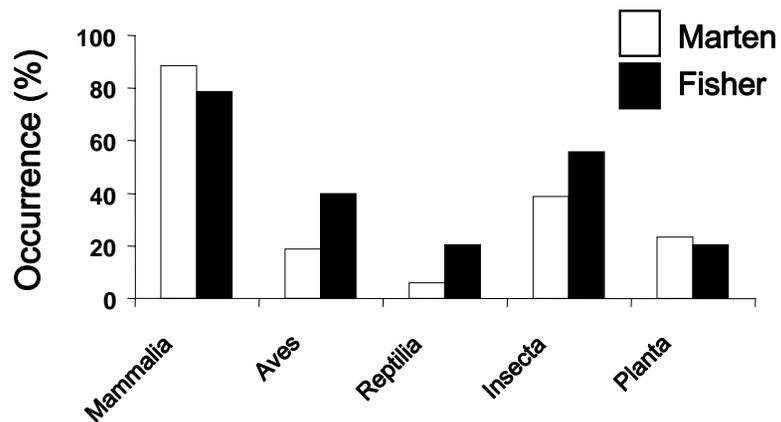
Location	Comments	
ME	Inverse relationship: commercial harvest	Hardy (1907)
CA	Trapper opinion	Grinnell et al. (1937)
Ontario	Inverse relationship: commercial harvest	de Vos (1952)
NH	Biologist opinion	Silver (1957)
Ontario	Marten remains in fisher stomach	Daniel (1960)
Ontario	Biologist opinion	Clem (1977)
Manitoba	Martens eaten by fishers	Raine (1981)
Ontario	Inverse relationship: commercial harvest	Douglas & Strickland (1987)
ME	Inverse relationship: commercial harvest	Krohn et al. (1995)
ME	Radio'd martens killed by fishers	Hodgman et al. (1997)
CA	Regional covariance: fisher & marten	Krohn et al. (1997)
CA	Local covariance: fisher & marten	Slauson & Zielinski (2004)

Body Size [kg]



(unpubl. data)

Marten and Fisher Diets



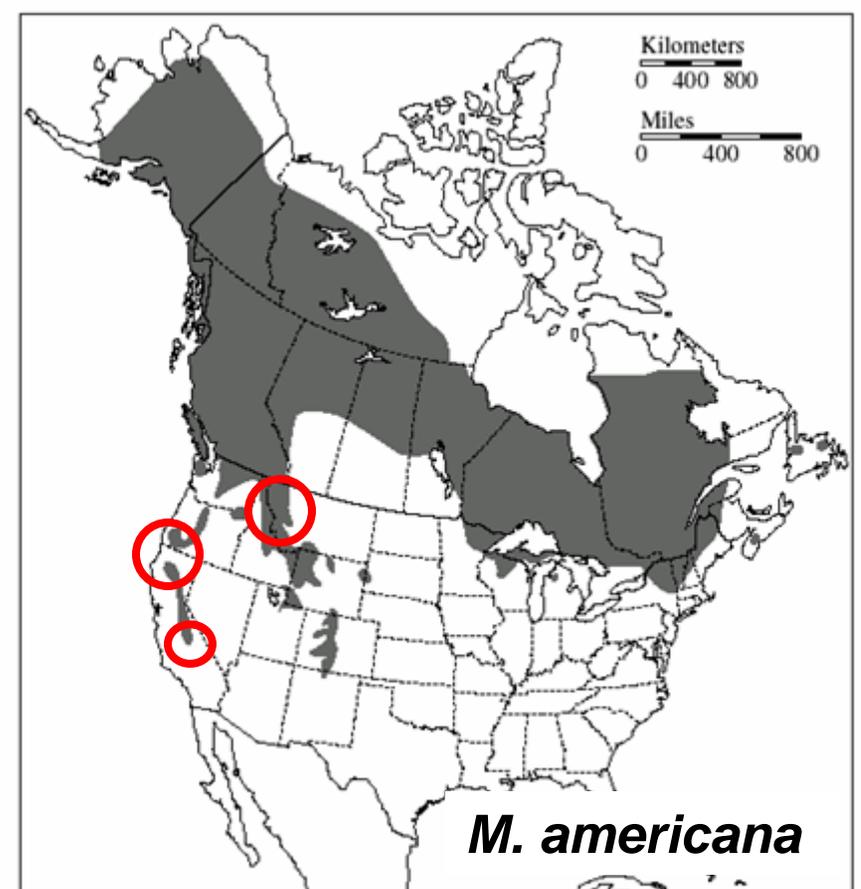
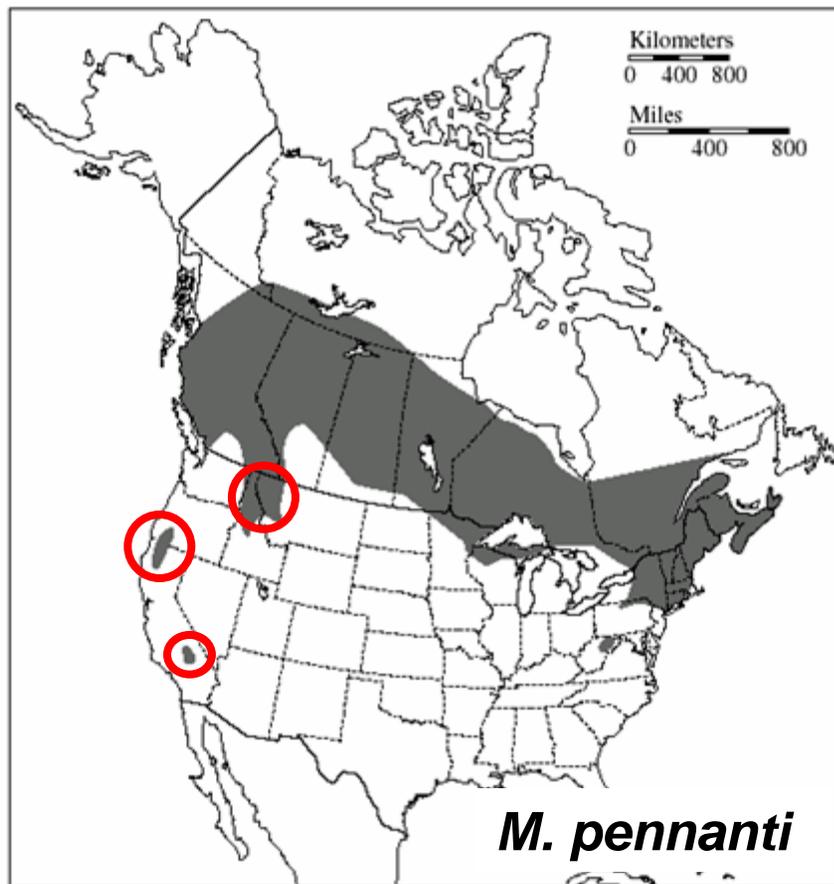
Hypogeous fungi in scats	Marten	Fisher
N	34	24
% samples w/ spores	44.1	91.7
Number of fungal taxa	5	7+

	Marten	Fisher
Levin's Niche Breadth	0.36	0.39
Shannon Diversity	2.84	3.16

Zielinski and Duncan (2004): Sierra Nevada

Continental Distributions Overlap but Regional Allopatry Occurs, Especially in West

- local separation by elevation and forest type
- divergent morphological and physiological (?) adaptations



Predominant California Wildlife Habitat Relations (CWHR) types

Fisher	Marten
White Fir	White Fir
Sierra Mixed Conifer	Sierra Mixed Conifer
Douglas-Fir	Douglas-fir
Montane Hardwood	Red Fir
Montane Hardwood-Conifer	Subalpine Conifer
Ponderosa Pine	Jeffrey Pine
Klamath Mixed Conifer	Lodgepole Pine
	Aspen
	Eastside Pine

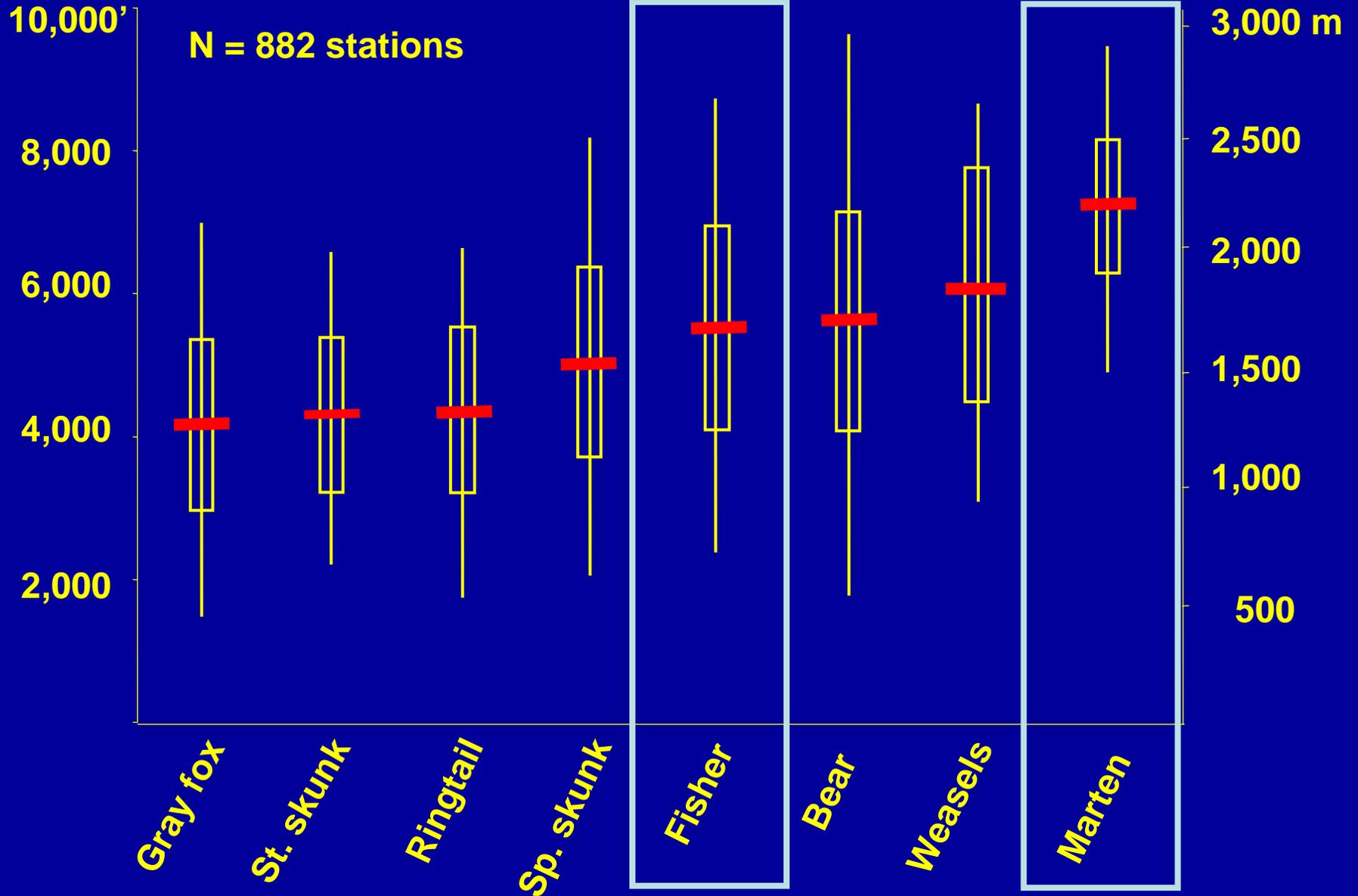
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Klamath Mixed Conifer	Lambert Pine
	Eastside Pine

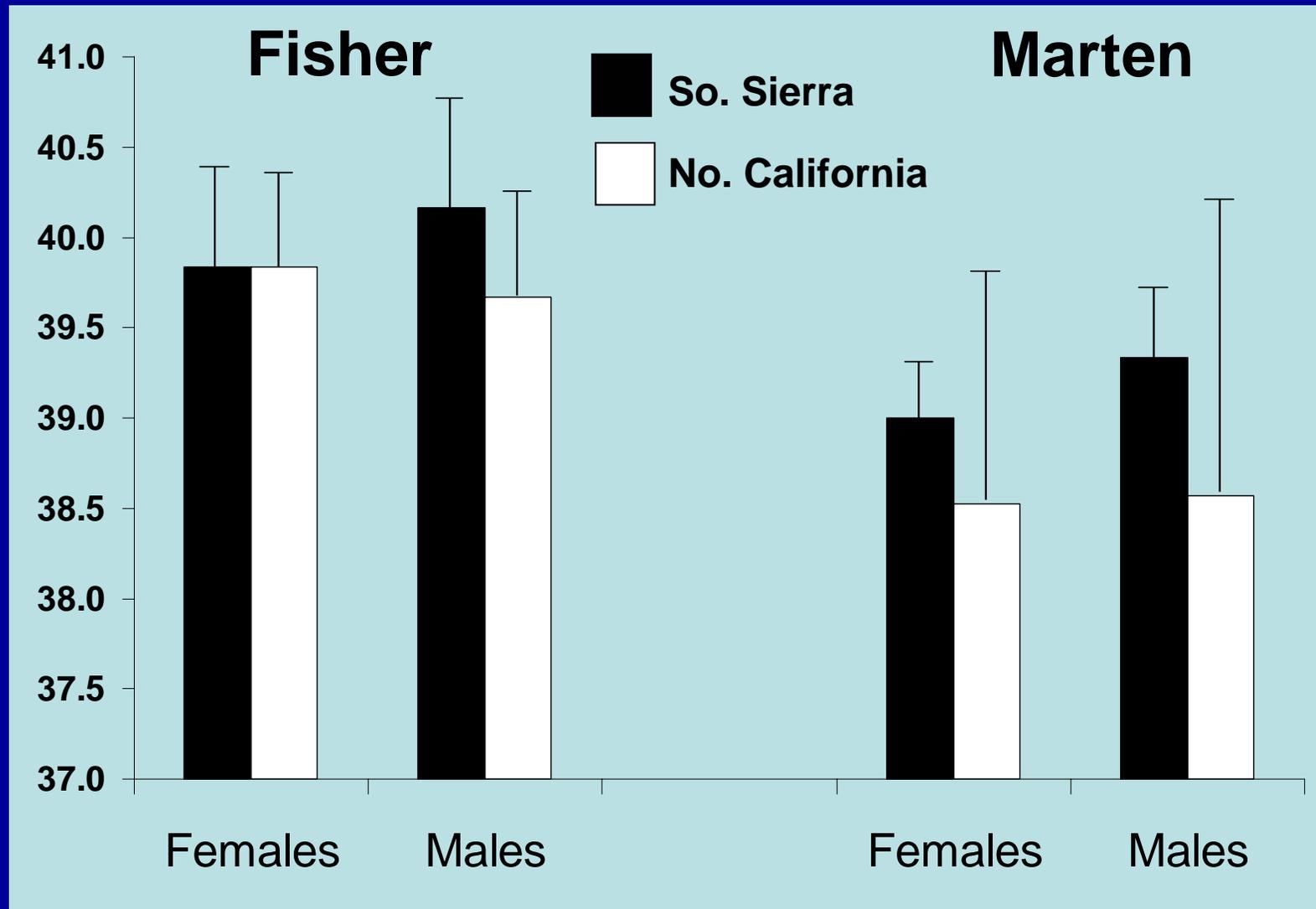
Mid Elevation Types

High Elevation Types

Elevations – Sierra Nevada

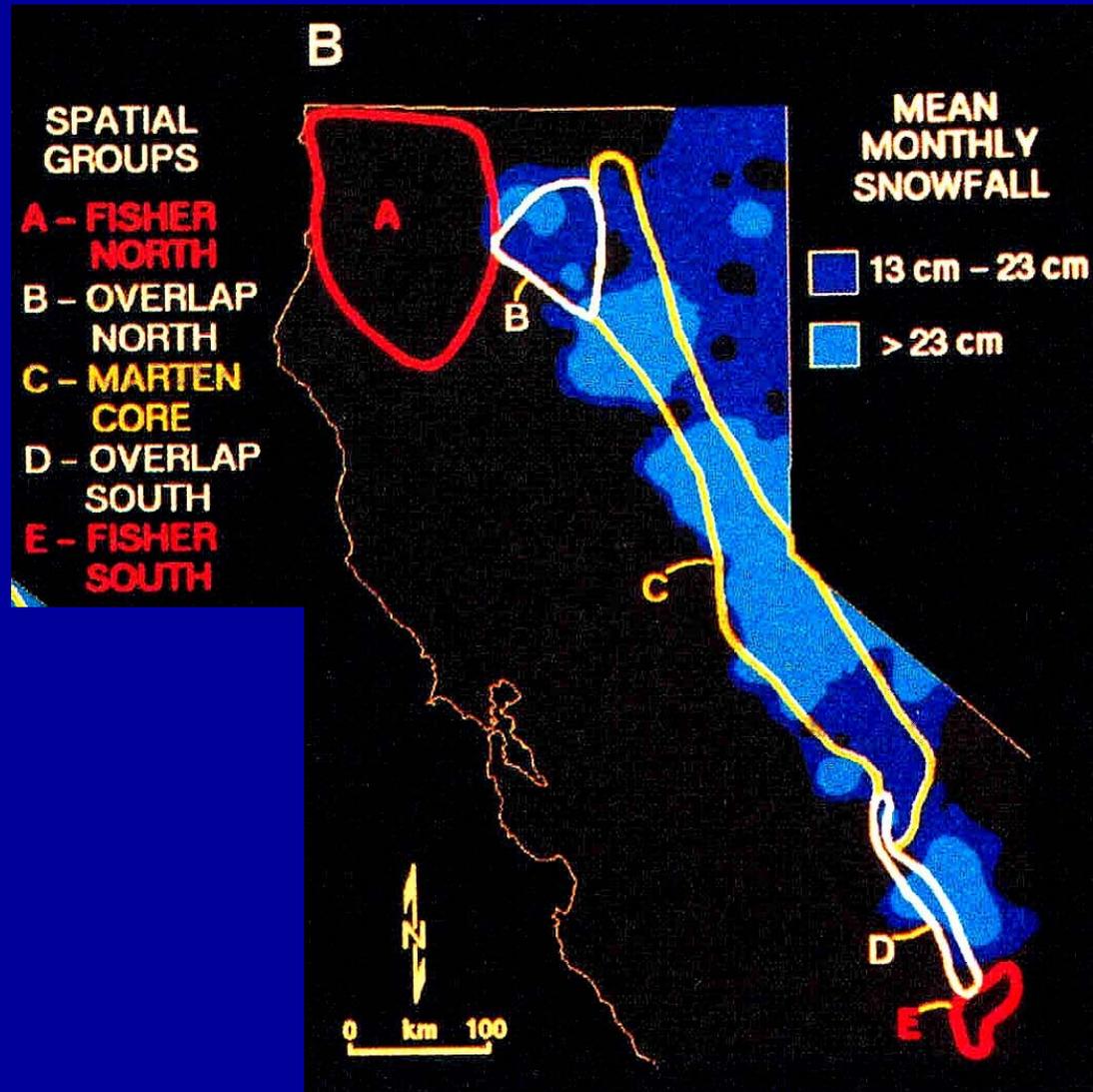


Body Temperature -initial [°C]



(unpubl. data)

The Influence of Physical Factors: Snow



Krohn et al. (1997)

$$\text{Foot loading} = \frac{\text{Body weight (g)}}{\text{Area of 4 feet (cm}^2\text{)}}$$

	Females	Males
Fishers	21.1 ± 6.7	32.0 ± 4.2
Martens	10.1 ± 0.9	12.2 ± 1.5
Ratios	2.1	2.6



Krohn et al. (2004)



Body Size Implications



Advantage: Fisher		Advantage: Marten
X	Interference Competition	
X	Exploitative Competition: Diet breadth	
	Mobility in Snow	X

Why do we care?

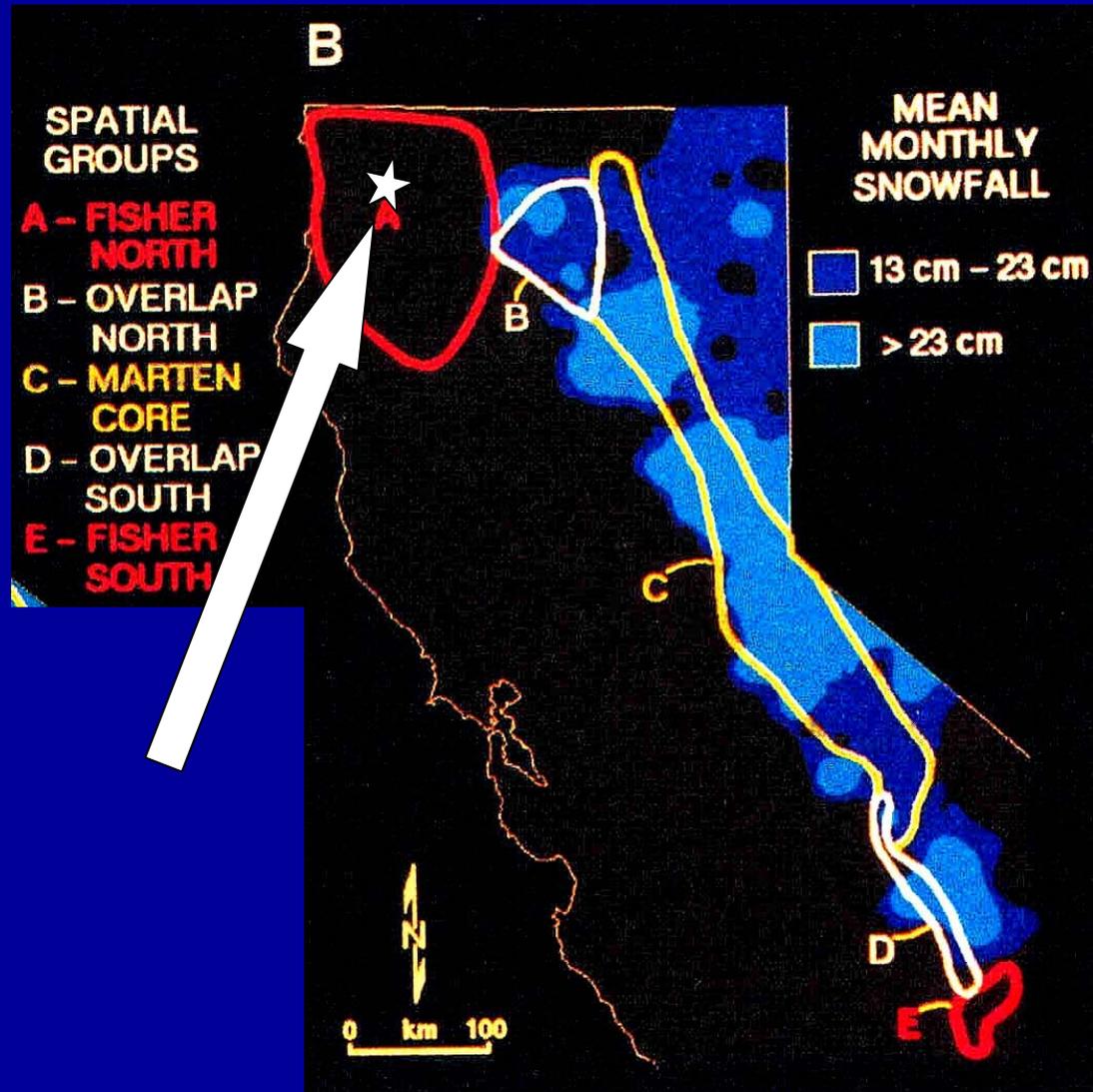
1. Marten recovery in North Coast

2. Concern about effects of a fisher reintroduction on martens in the Sierra

3. Conservation planning for each species

- Can the same areas be managed for both species?

The Influence of Physical Factors: Snow



Krohn et al. (1997)

Habitat Selection by Coastal Martens

Stand Scale

+ Dense Shrub Cover

+ Old Gr., Shrub
+/- Late-mature
- Other 3 Stages

+ Conifer Dominated

Home Range Scale

**+ Large Patches of
OG or OG & LM**

**- Amount of
Area Logged**

**+ Large Areas of
Serpentine Forest**

Marten Habitat

Shrub Cover in Coastal Forests

Characteristics

Dense & Spatially extensive

Surface Complexity

Dominated by mast Producers

Importance

Overhead Cover

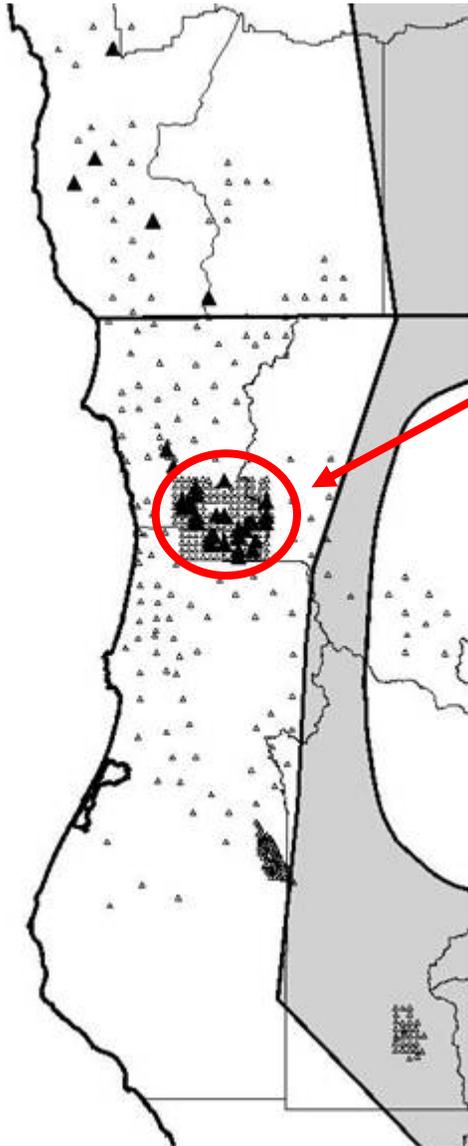
Food

Rest Sites

Competitive advantage



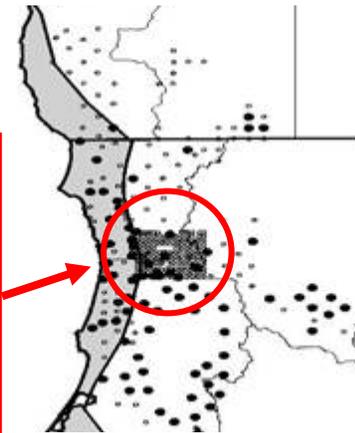
Marten Survey Results



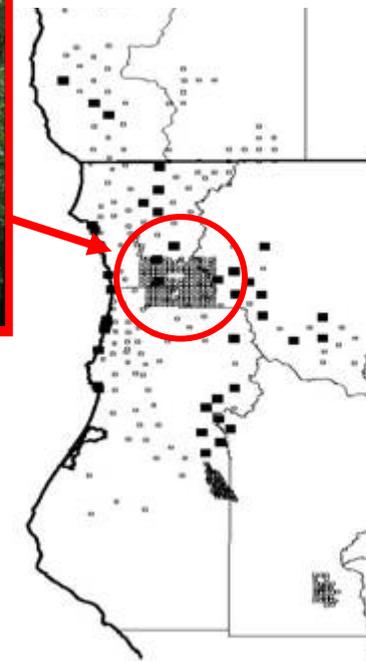
Dense Shrubs



Fisher



Gray fox





Body Size Implications



Advantage: Fisher		Advantage: Marten
X	Interference Competition	
X	Exploitative Competition: Diet breadth	
	Mobility in Snow	X
	Mobility in Dense Shrub (?)	X

- *Deep snow or dense shrub areas may provide refugia for martens*

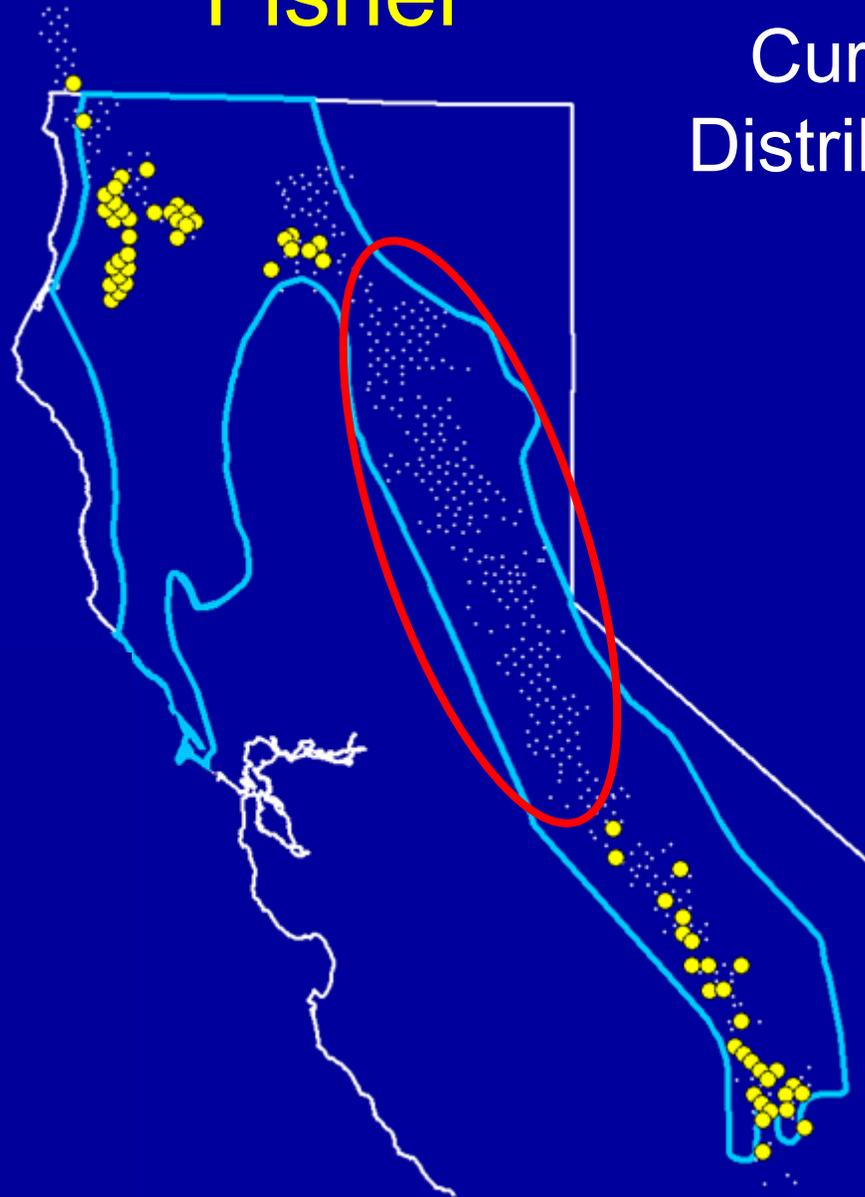
Why do we care?

1. Marten recovery in North Coast
2. Concern about effects of a fisher reintroduction on martens in the Sierra
3. Conservation planning for each species
 - Can the same areas be managed for both species?

Effects of Fisher Reintro on Martens

Fisher

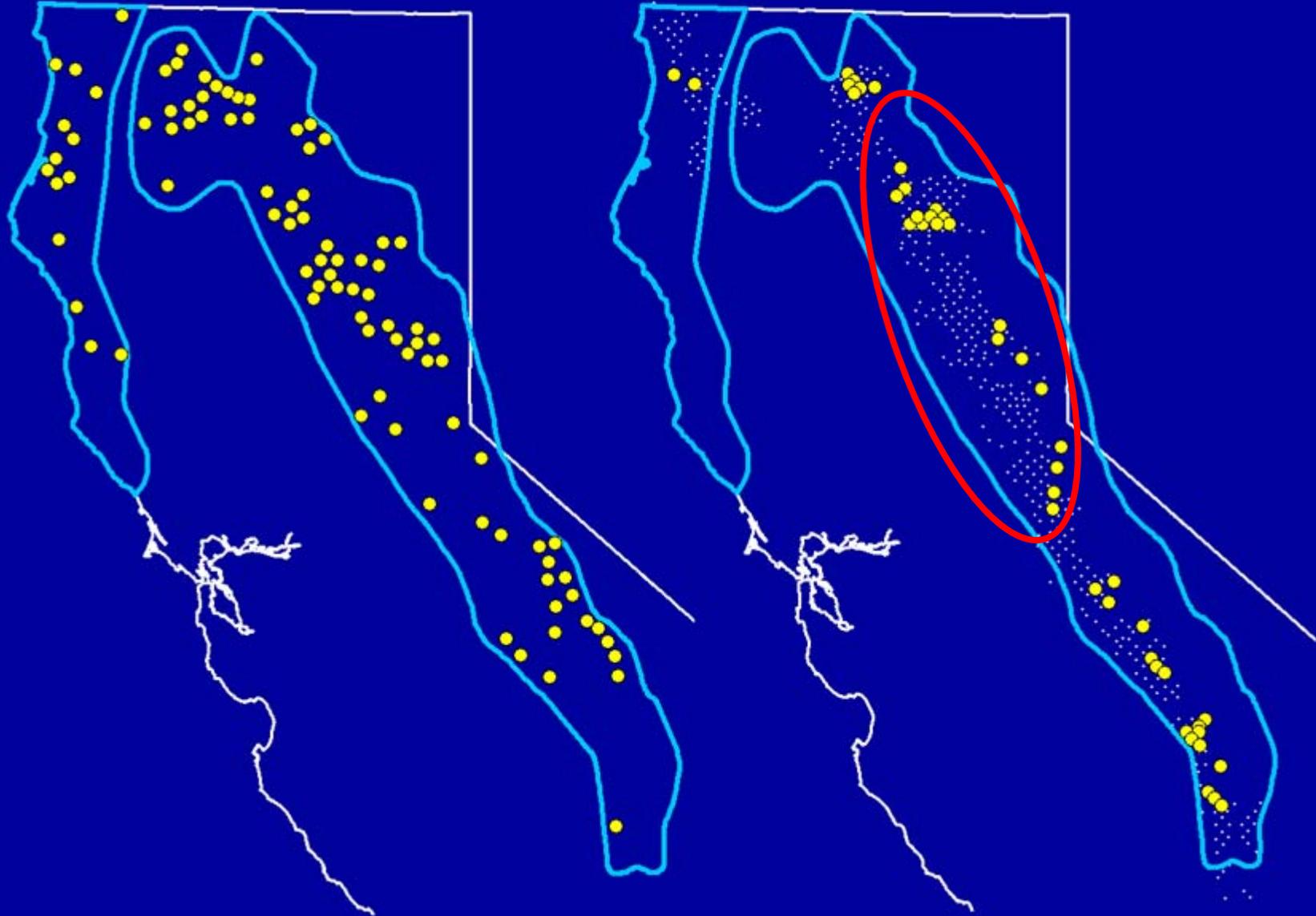
Current
Distribution



Effects of Fisher Reintro on Martens

Historical **Marten**

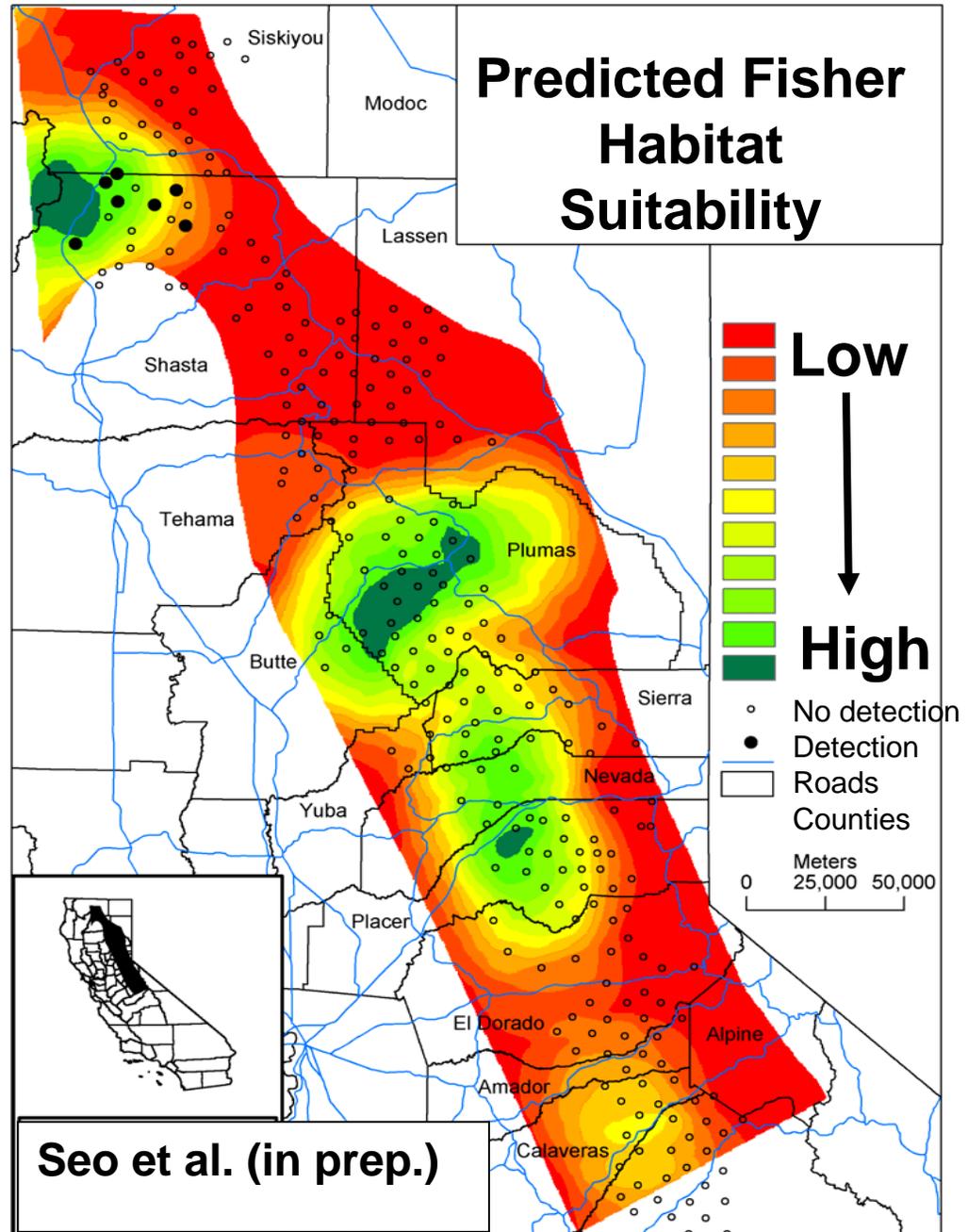
Contemporary

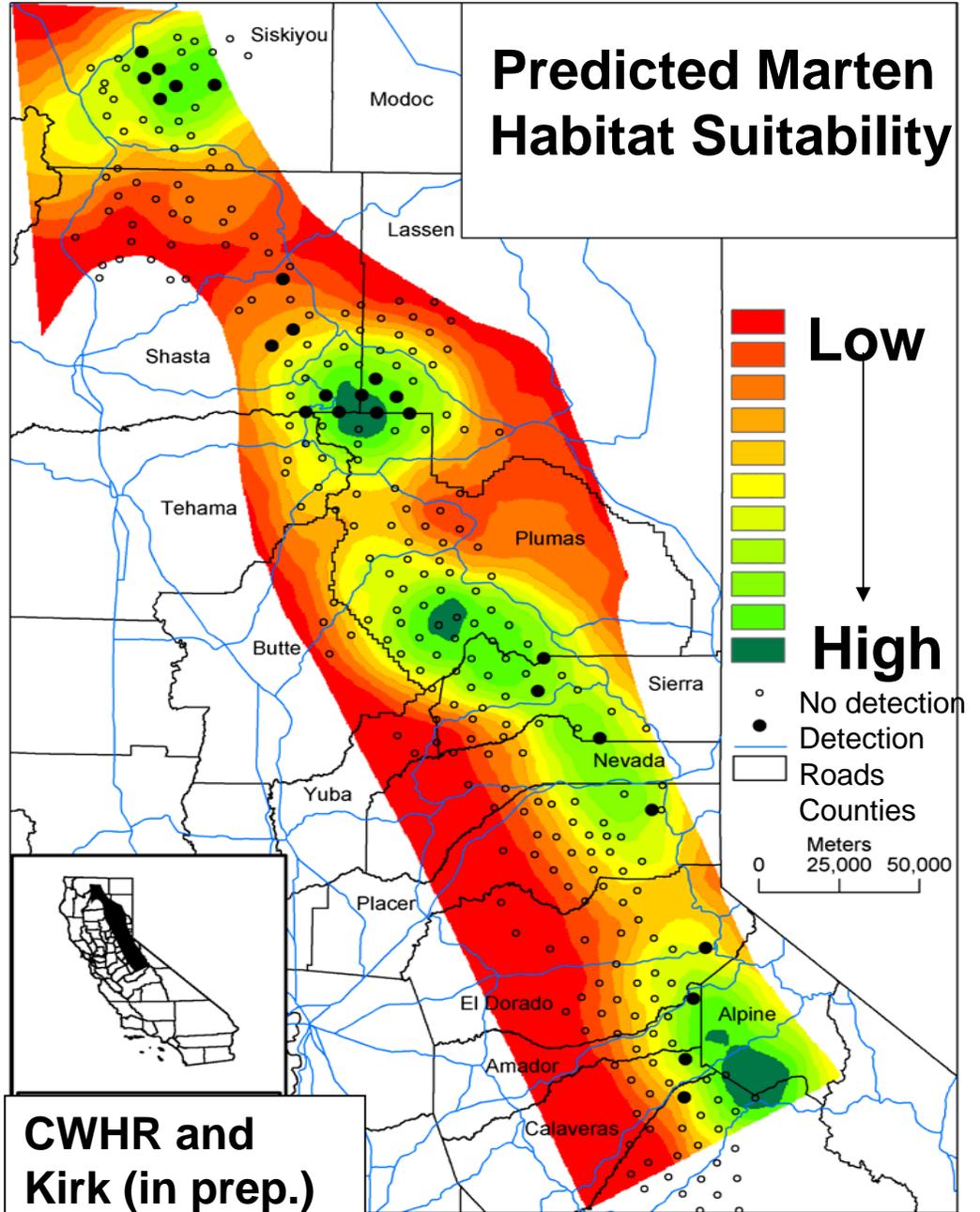


Where are the best place(s) in the northern Sierra for fisher restoration that also minimize potential negative effects on martens?

Approach:

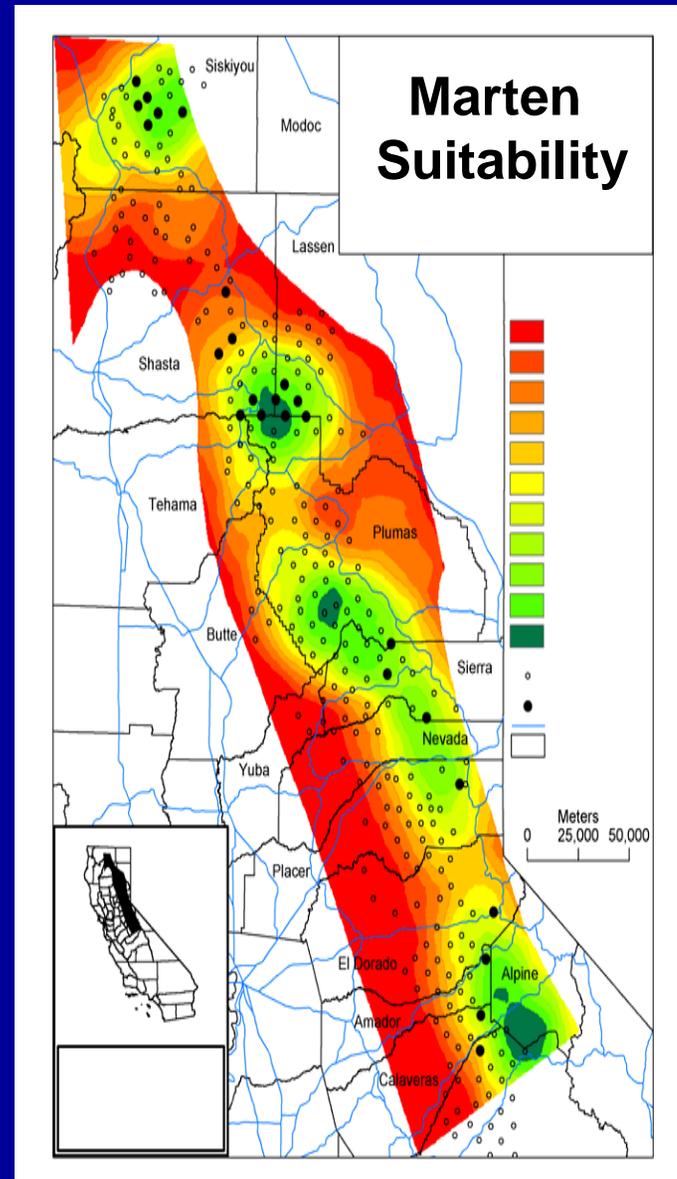
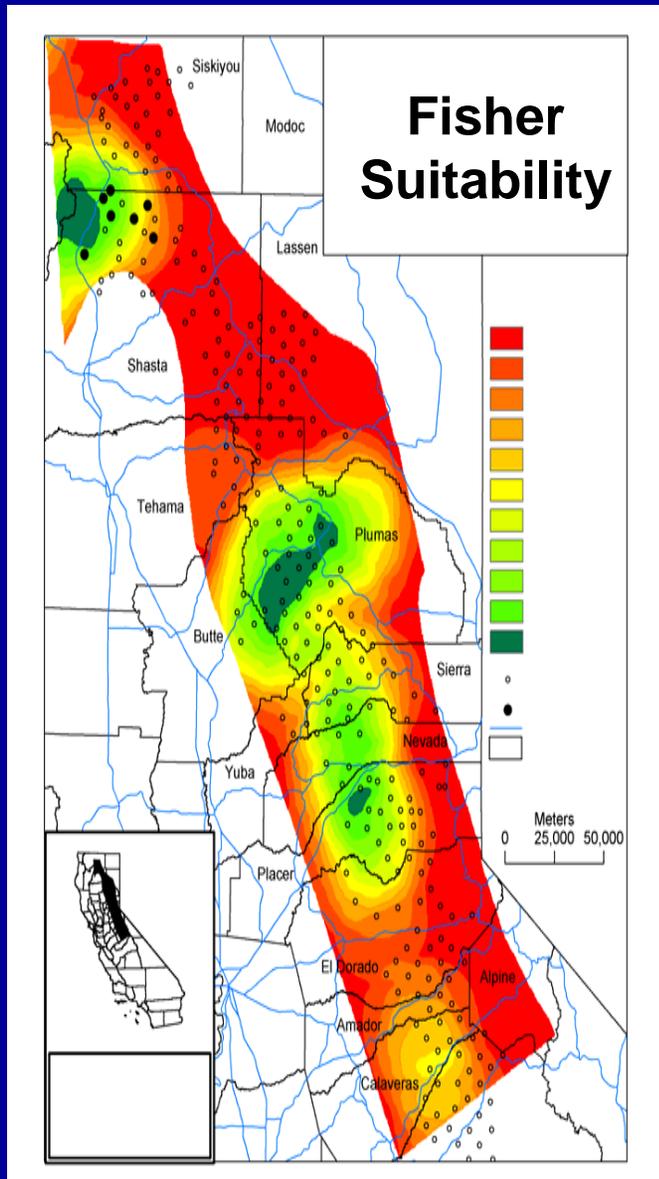
1. Optimize the selection of places with high fisher AND low marten landscape habitat suitability.
2. Contrast habitat models
 - Fisher: using Seo et al. (in prep.)
 - Marten: using Kirk (in prep.)





CWHR and Kirk (in prep.)

Effects of Fisher Reintroduction on Martens



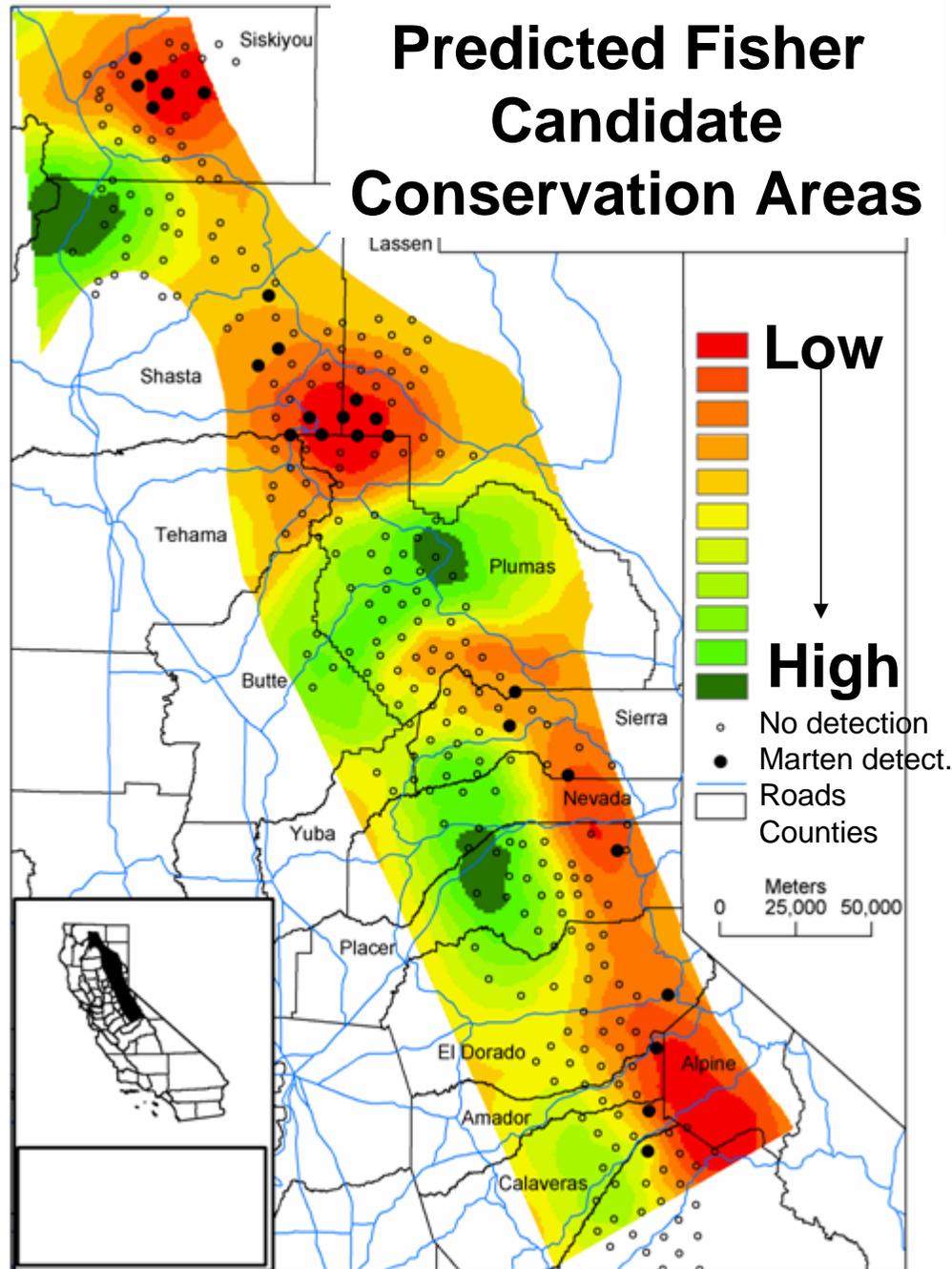
Fisher focalsum

-

Marten focalsum

=

Predicted Fisher Candidate Conservation Areas



Why do we care?

1. Marten recovery in North Coast

Extremely Important Consideration: Similar in Eastern US

2. Concern about effects of a fisher reintroduction on martens in the Sierra

Important But Not Critical

3. Conservation planning for each species

- Can the same areas be managed for both species?

Not Necessarily

