

The southernmost population of *Pekania pennanti* has been isolated in the southern Sierra Nevada, California, USA, for thousands of years and has undergone multiple contractions and expansions over time. Since European occupation, the population declined and contracted dramatically southward, (with some re-expansion following protections) in response to myriad changing conditions and threats, from logging and trapping to poisoning and severe wildfire. Most recently, the population is experiencing dramatic habitat reduction due to climate change and increasingly large, severe fires. Conservation efforts must focus on helping this endangered population shift and adapt to rapidly changing, non-analog habitat conditions and to maintain its remaining genetic diversity.



## Timeline of a Unique, Isolated, Imperiled *Pekania* Population

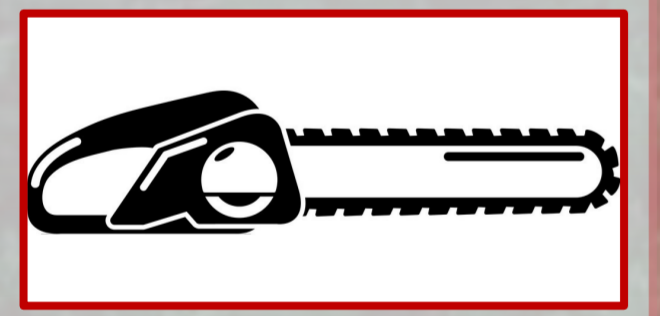
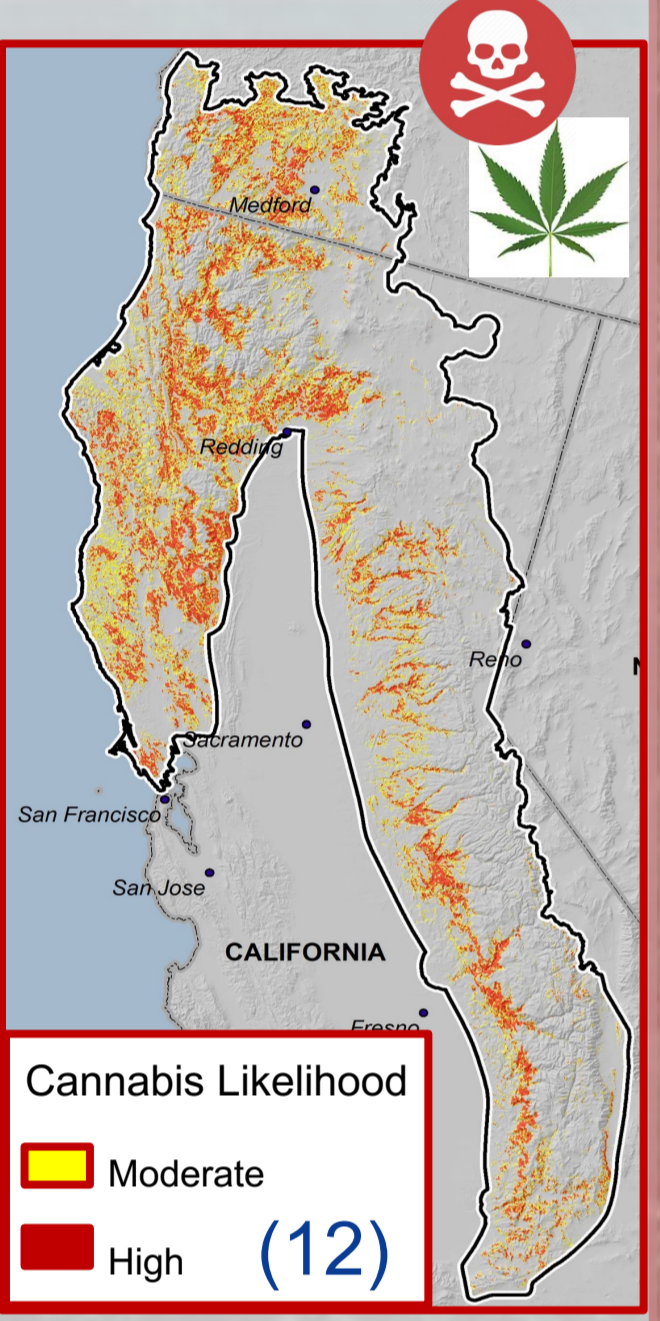
- Genetically isolated, southernmost fisher population, listed as Endangered
- Mediterranean climate; pinched between heat and snow in a narrow elevation band
- Lack of larger prey (porcupines & hares, which are dietary staples elsewhere)
- Constantly evolving threats, from trapping and poisoning to climate change and severe fire
- Increasingly severe fire regime removing and fragmenting habitat and populations

### Major Threats

Climate change, wildfire, rodenticide poisoning



Rodenticide poisoning associated with illegal cannabis grows (1,8,12)



~1900-1980: Porcupine persecution



~1850-1946: Trapping and logging (9,10)



Climate shifts (extended droughts?) (9,19)

### Population Size & Trends

2023: N unknown (<300); trends likely negative (11)

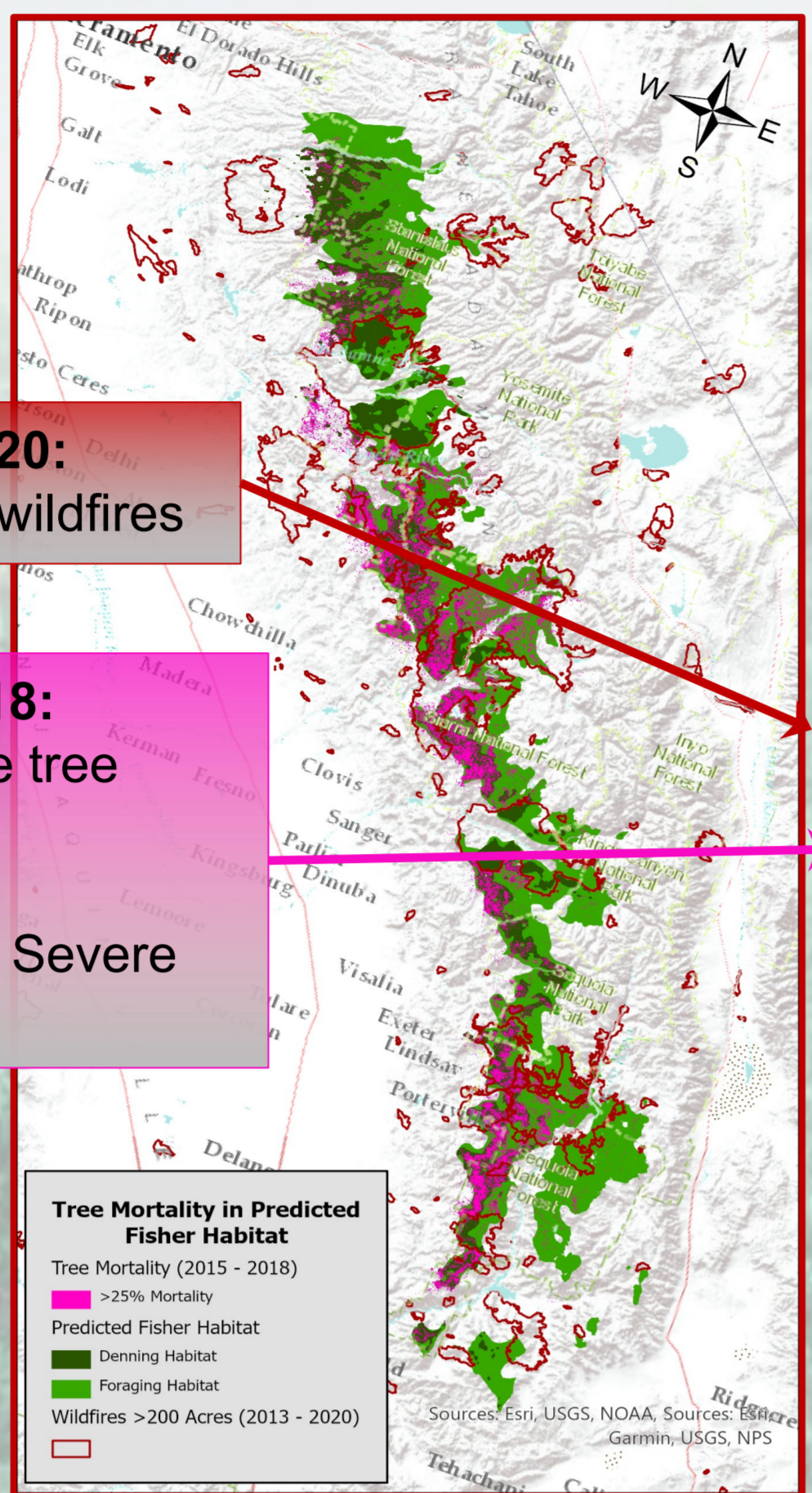
2013-2020: Extreme wildfires

2015-2018: Extensive tree mortality

2012-16: Severe drought

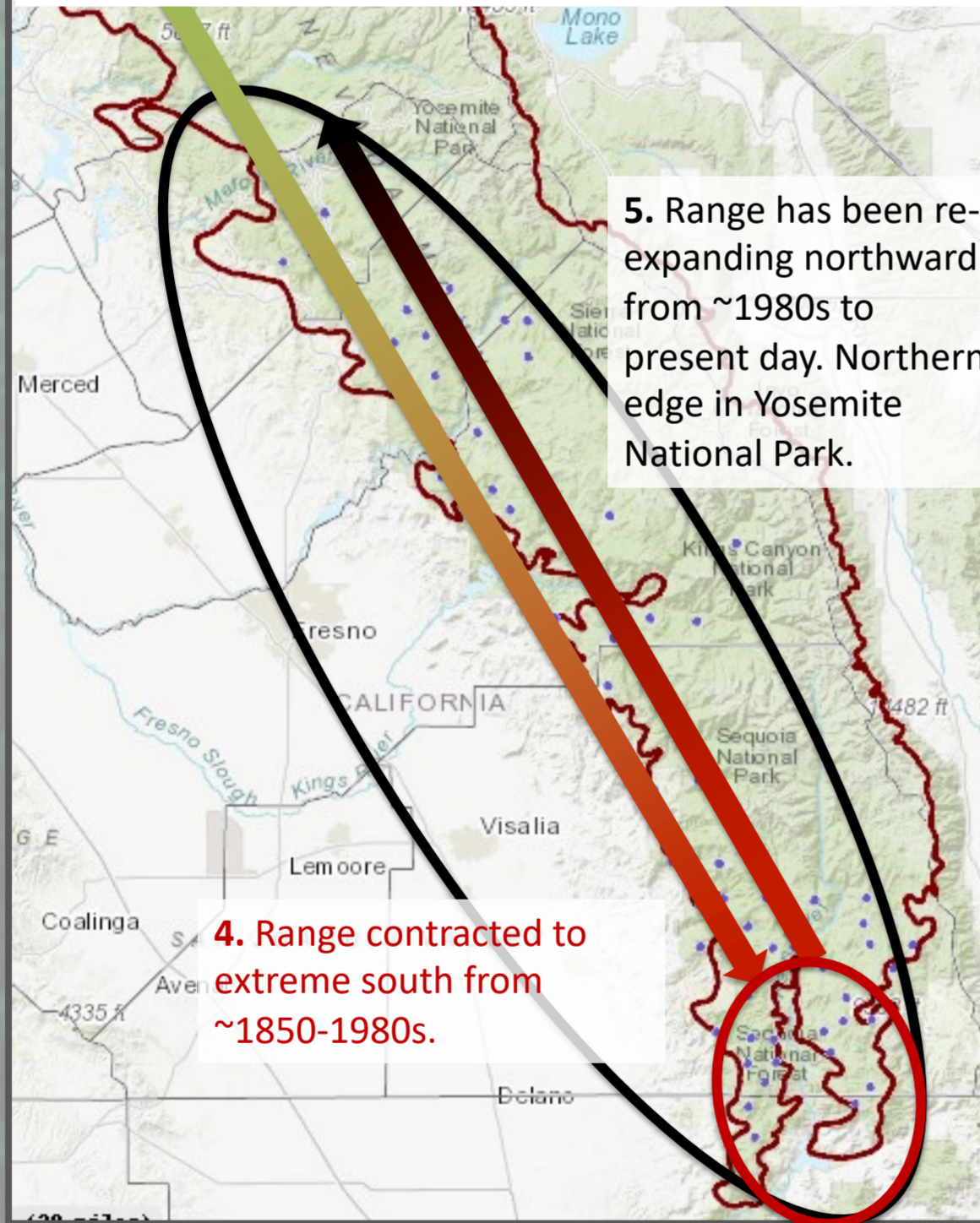
2008: N = 160-360 (3,4);  $N_e$  ~130-170? (9,10,11)

2002-2015: Population stable (11,13)



Mid-1900s-present day: Fire suppression and logging greatly alter forest structure and composition, increasing tree stress and fire intensity

### Post-European Fisher Range Changes (9,10,11)

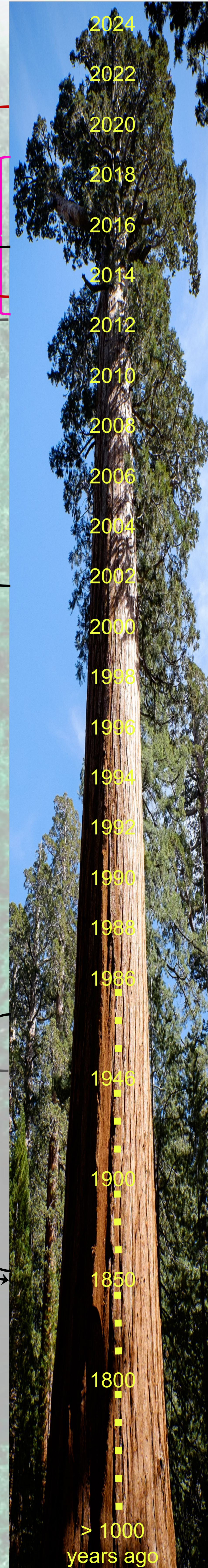
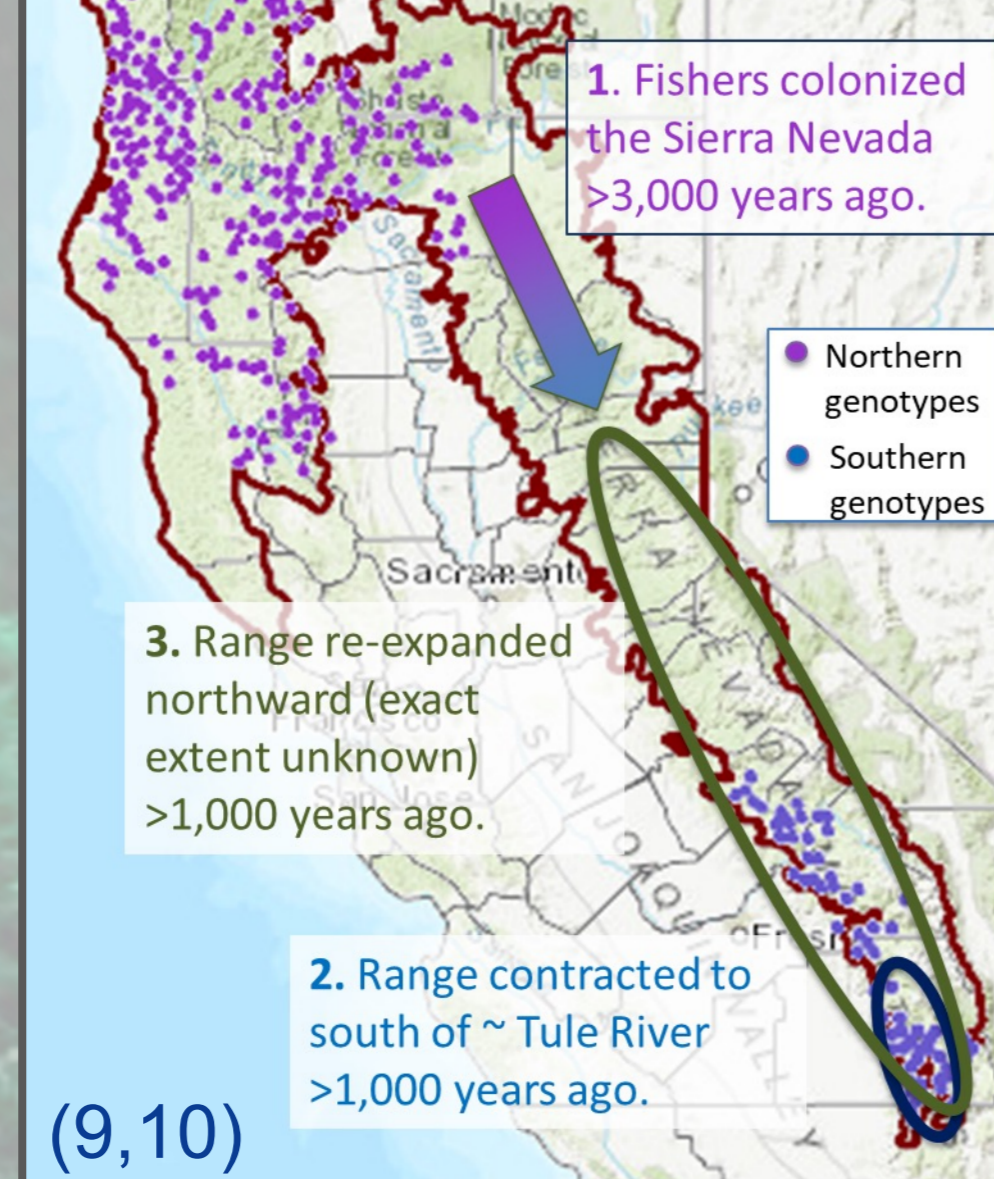


~1850-1980s: Rapid decline, contraction to southernmost tip of the range, which was relatively unaffected by logging and trapping;  $N_e$  ~50-120 (10,11)

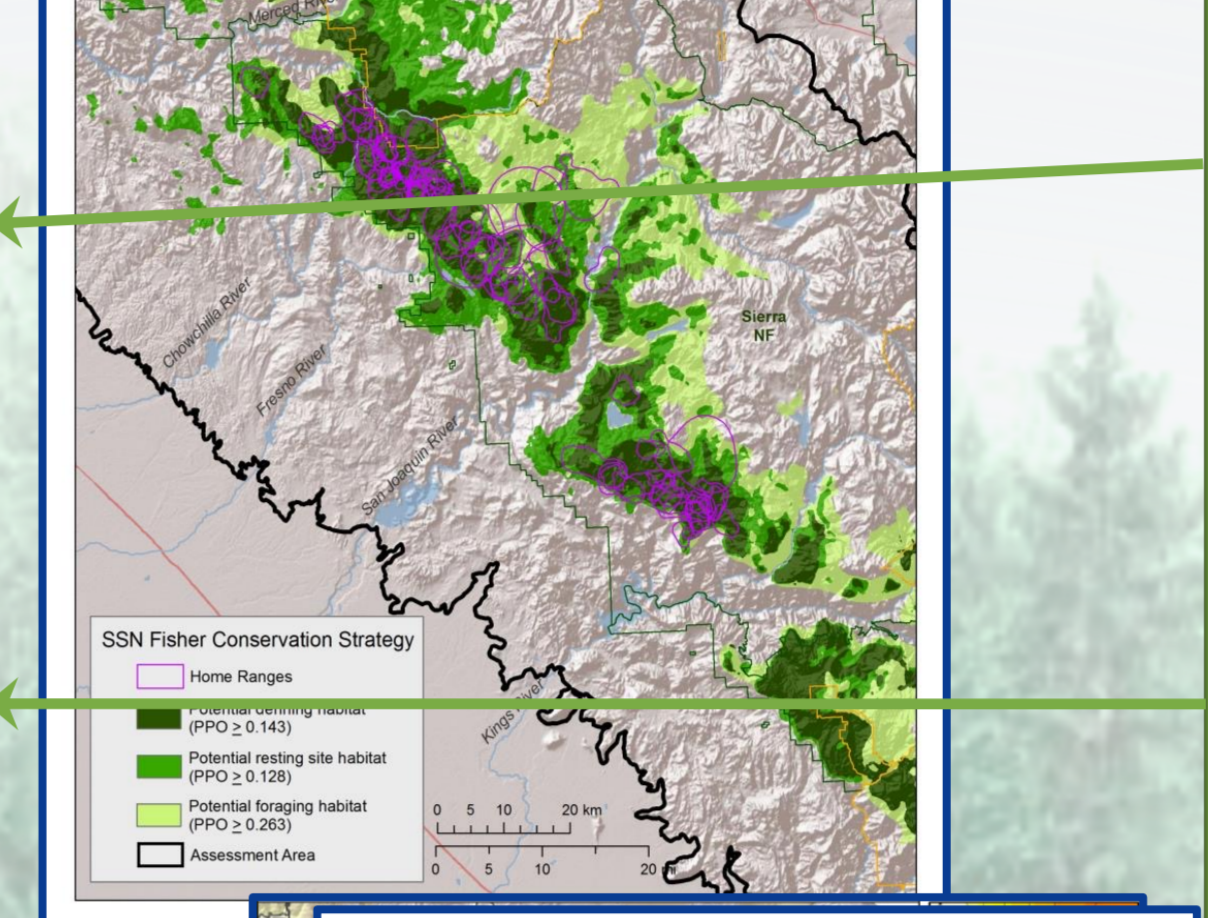
Genetic analyses indicate ~90% population decline prior to European settlement to  $N_e$  ~160-190, followed by re-expansion to  $N_e$  >1,000 (9,10,11)

$N_e$  ~1600-1900 (9,10,11)

### Pre-European Fisher Range Changes (9,10)



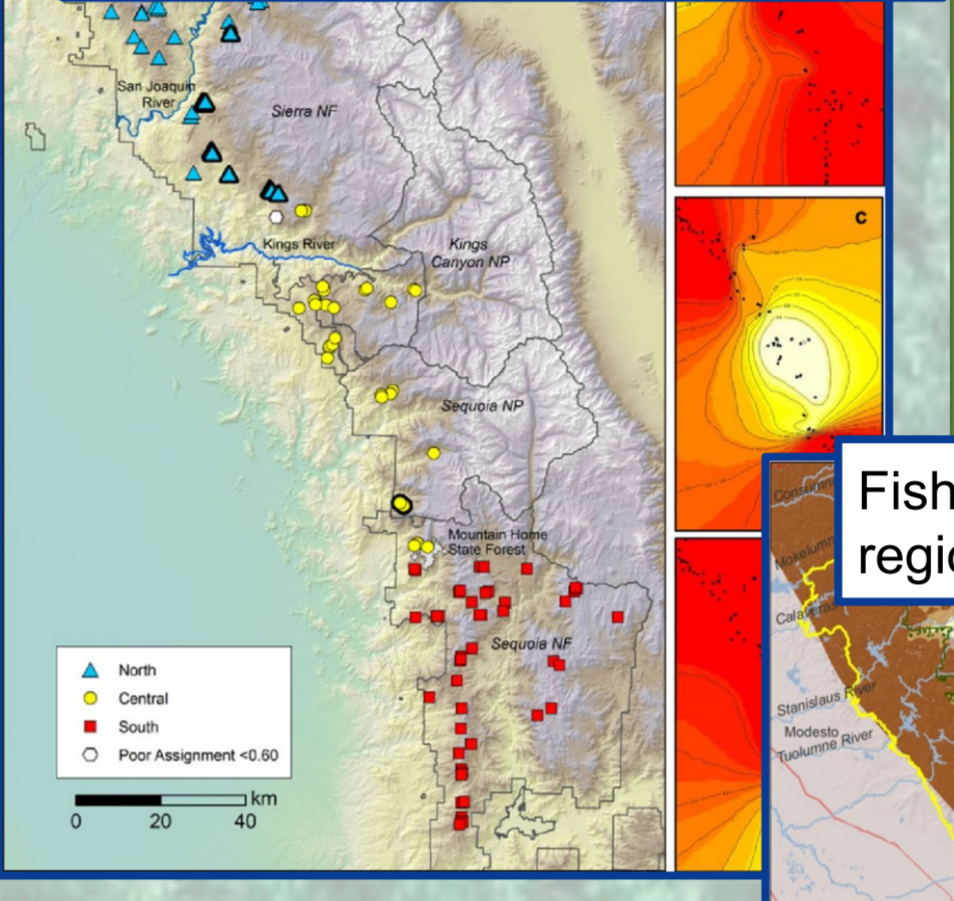
Modeled denning, resting, and foraging habitats, and home ranges of female fishers that contributed data to habitat and population models (4,5,6,7).



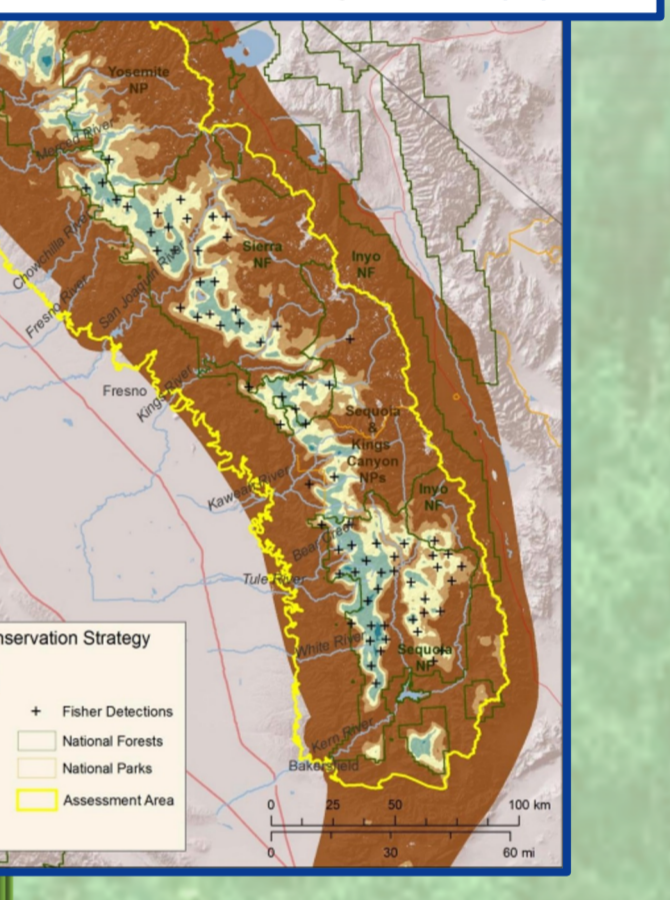
2020: Listed as Endangered under the US Endangered Species Act

2015-16: Fisher Conservation Assessment & Strategy (4,5)

Genetic subdivisions (9)



Fisher distribution model using regional monitoring data (3)



2002: Annual rangewide occupancy monitoring initiated (9,11)



1989-1994: Regional monitoring surveys document fisher occupancy and distribution (14).



1946: Trapping outlawed

### Recommendations

- Control threats like roadkill and poisoning
- Manage forests to facilitate transition to non-analog climate regime (prescribed fire, climate-smart restoration)
- Accommodate distribution shifts via forest management (maintain/improve forest connectivity)

### References

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### Research Highlights



~2010: Rodenticide poisoning associated with illegal cannabis cultivation identified as a major threat (1,8,12)

2007: Fisher Baseline Assessment: Population size & distribution; habitat models; threats; management recommendations (2)

2007-2019: Intensive population studies: demography, genetics, mortality causes, food habits, habitat & space use; etc. (6,7,8,9,10)

