The Role of Fire in Managing Invasive Species at the Santa Rosa Plateau Ecological Reserve

Cal-IPC Mini Symposium
Cal Poly Pomona
June 13, 2022

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- Prescribed fire and managing non-native annual grasses

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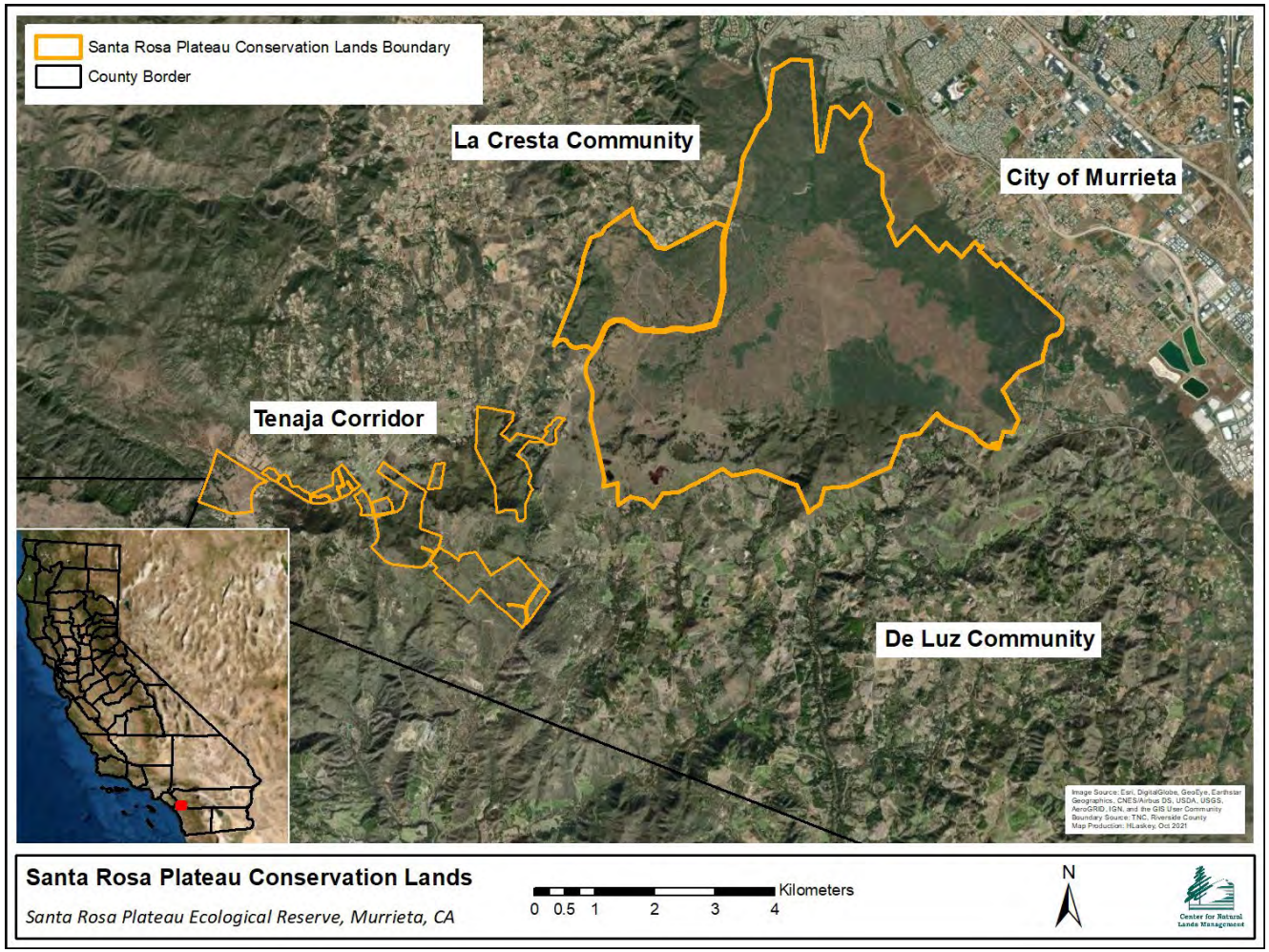
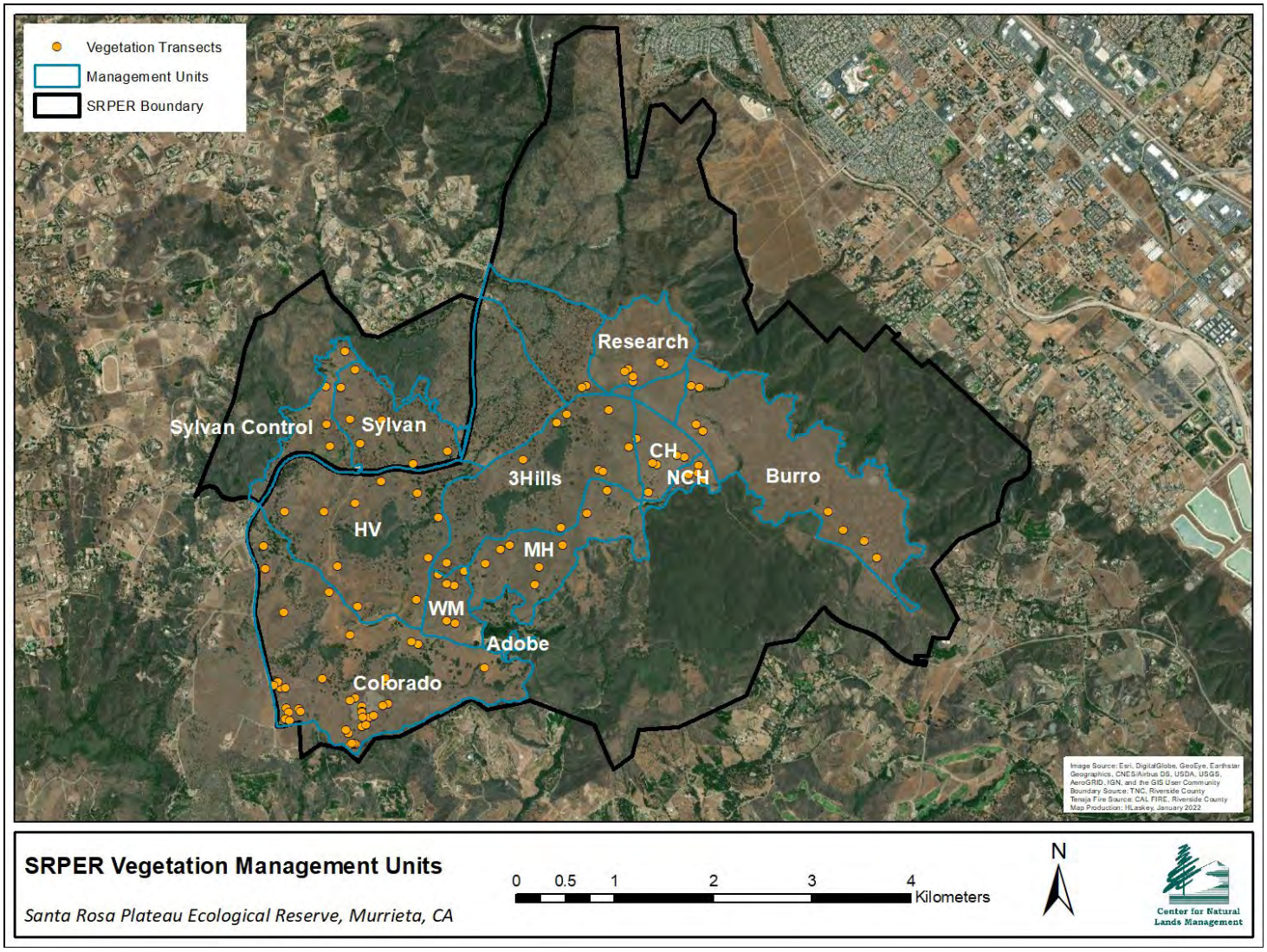
- Prescribed fire and managing non-native annual grasses
- Prescribed fire and yellow starthistle (*Centaurea solstitialis*)
- Managing stinknet (*Oncosiphon pilulifer*) after wildfire

Santa Rosa Plateau Ecological Reserve



- Western Riverside County
- Murrieta, CA
- Various parcels are owned by CDFW, The Nature Conservancy and Riverside County Parks and Open Space District
- Natural Resources are managed by CNLM
- ~3,500 acres of grassland

Grassland Management



- Vegetation Management Plan with CAL FIRE
- 14 mgmt. units
- 2 control units
- 83 vegetation transects

Characteristic Native Grassland Species

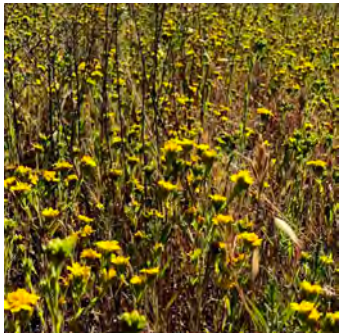
Stipa pulchra bunches and Calochortus splendens

Sidalcea malviflora

Sisyrinchium bellum

Fritillaria biflora

Dichelostemma capitatum



Amsinckia species

Clarkia purpea

Lasthenia californica

Escholtzia californica

Viola pedunculata

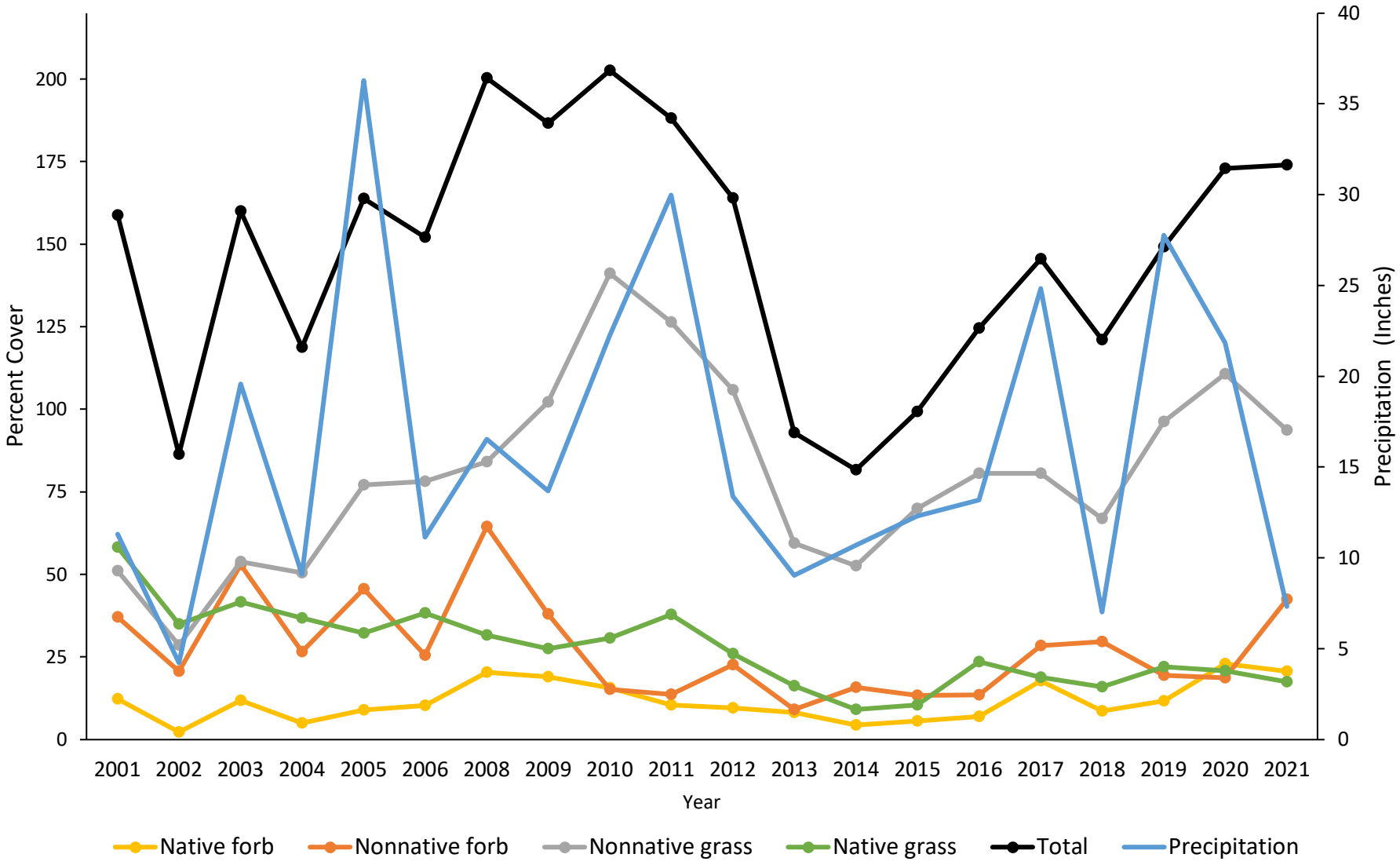
Characteristic Non-native Grassland Species

- Forbs
  - *Hirshfeldia incana*
  - *Lactuca serriola*
  - *Carduus pycnocephalus*
  - *Cirsium vulgare*
  - *Erodium species*
  - *Vicia* sp.
- Grasses
  - *Avena fatua*
  - *Bromus diandrus*
  - *Bromus madritensis*
  - *Festuca perennis*
  - *Festuca myuros*
  - *Aegilops cylindrica*

SRPER Vegetation Cover 2001-2021

NF, **NNF**, **NG**, **NNG** cover significantly changed over time

NF, **NNF**, **NNG**, and **Total** cover significantly changed with precipitation



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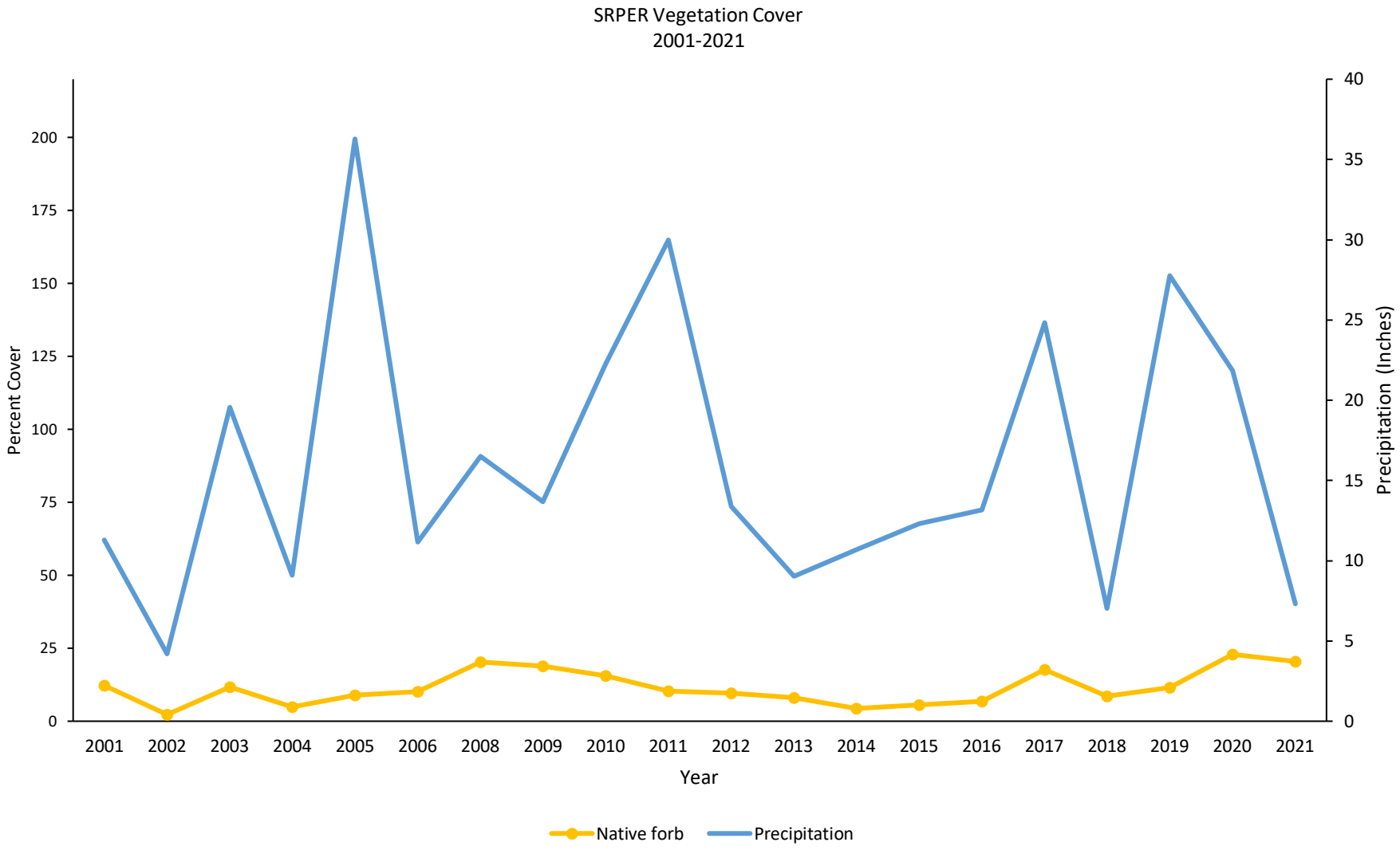

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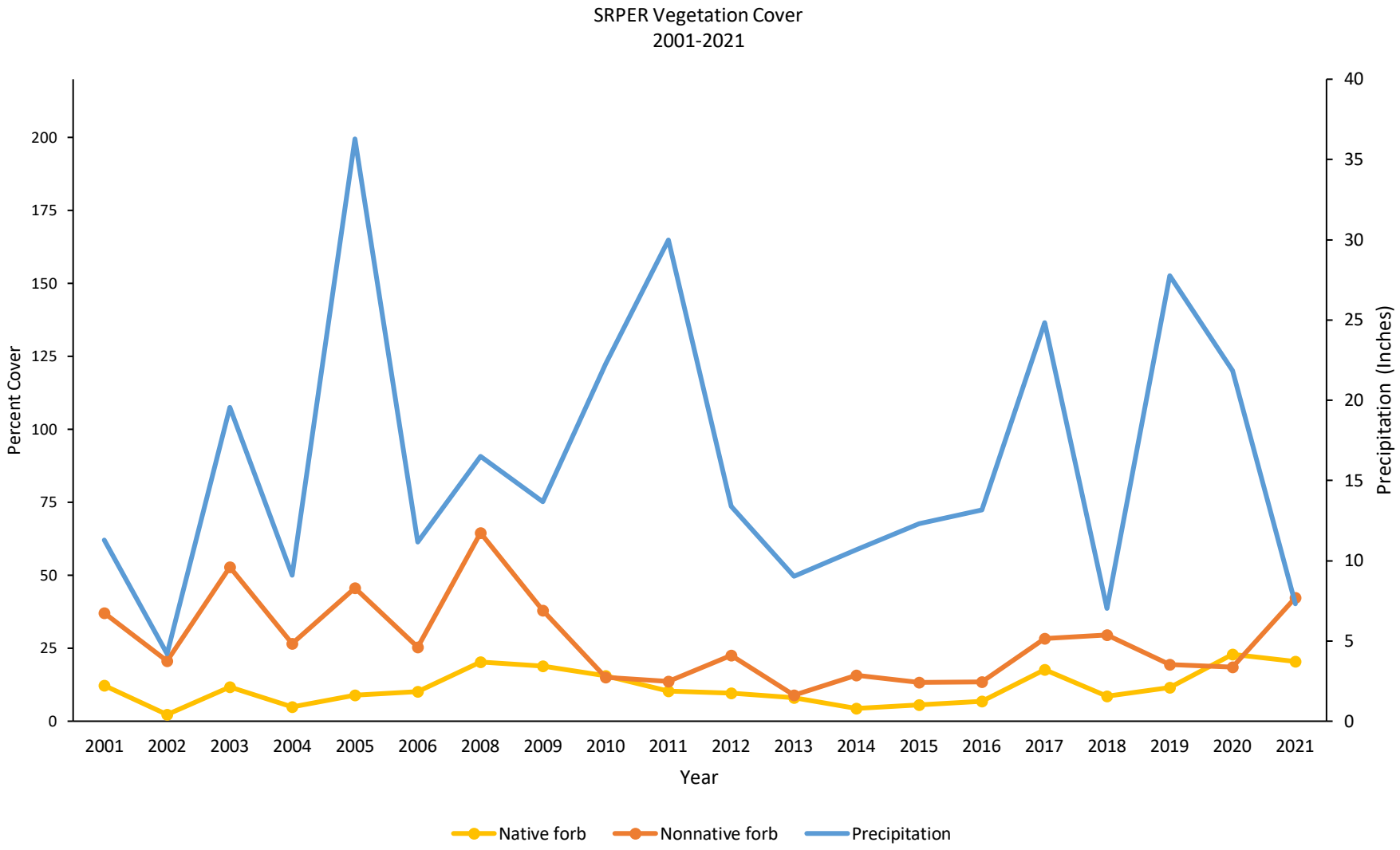

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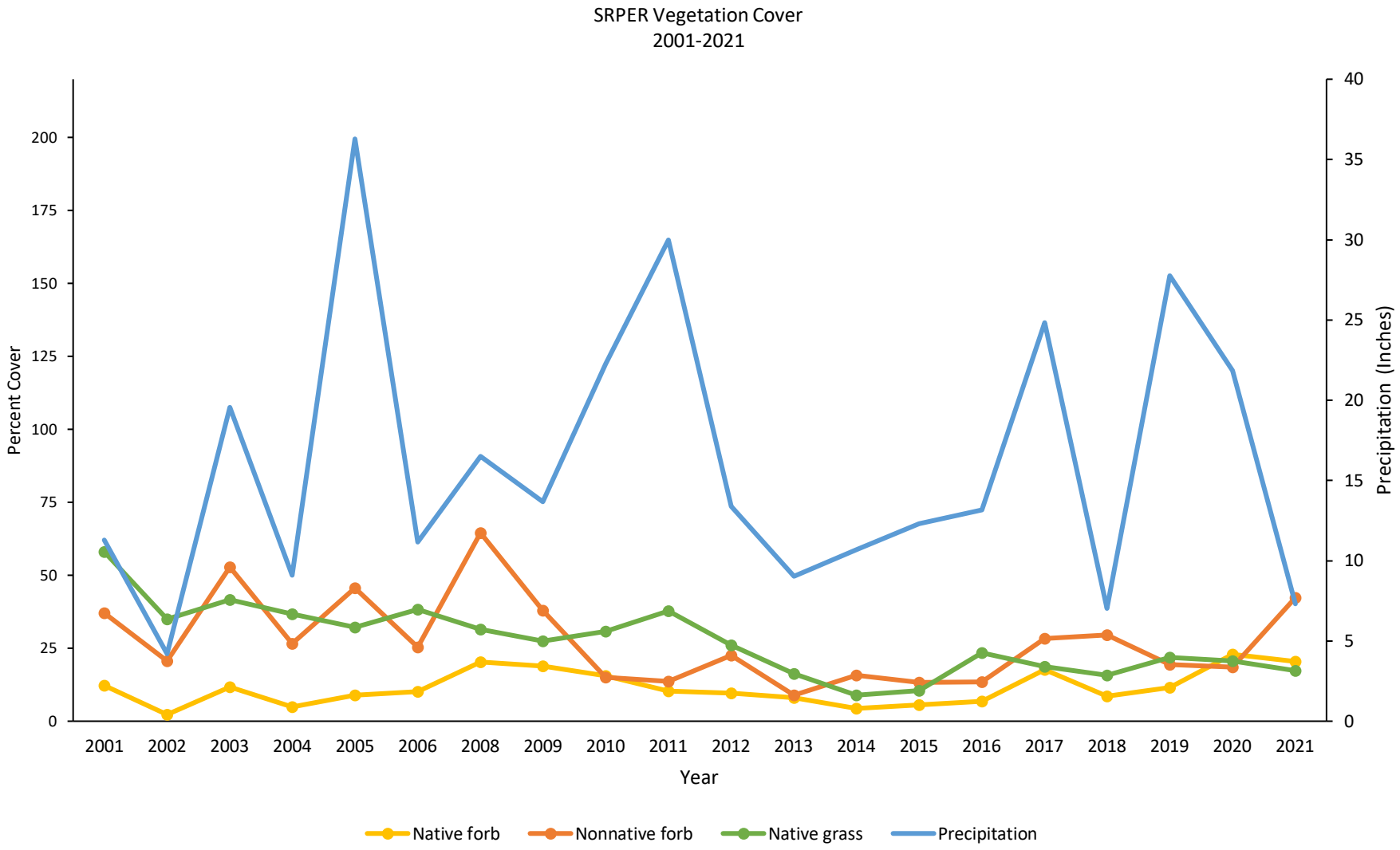

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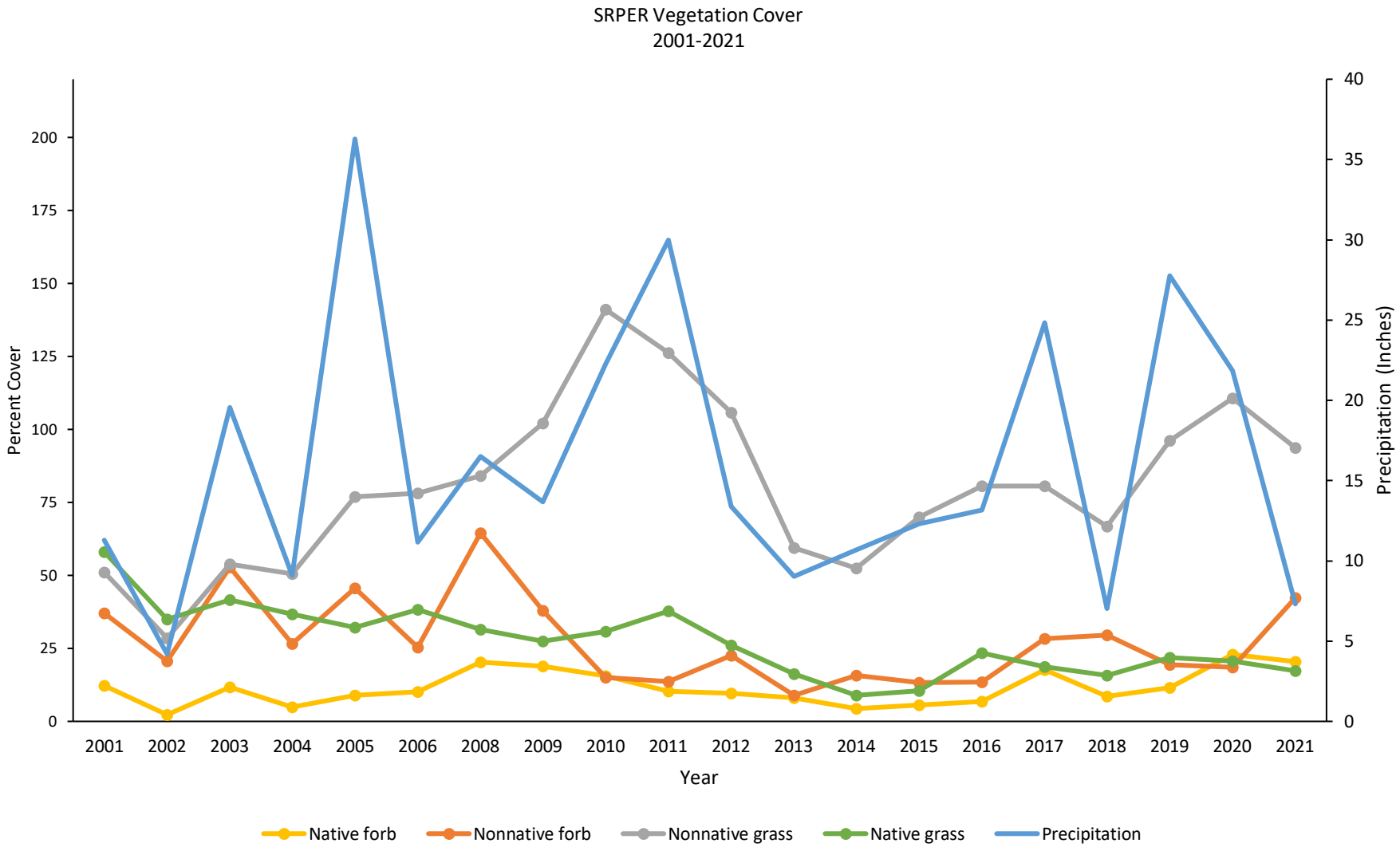
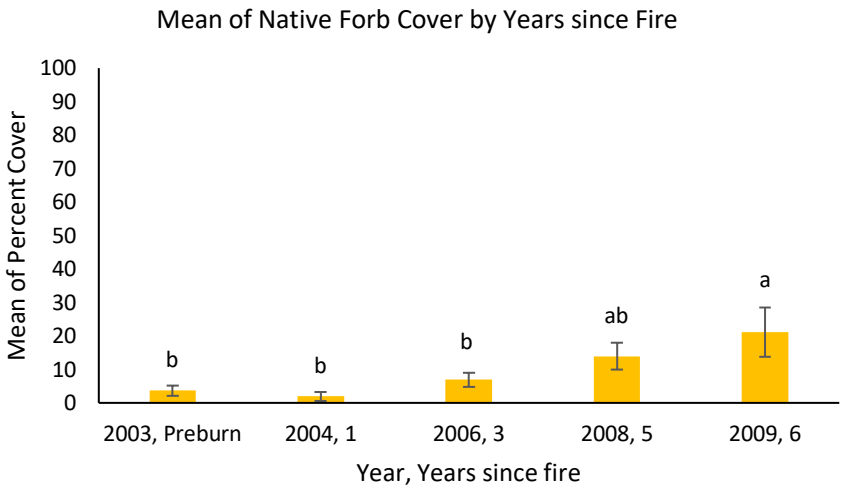
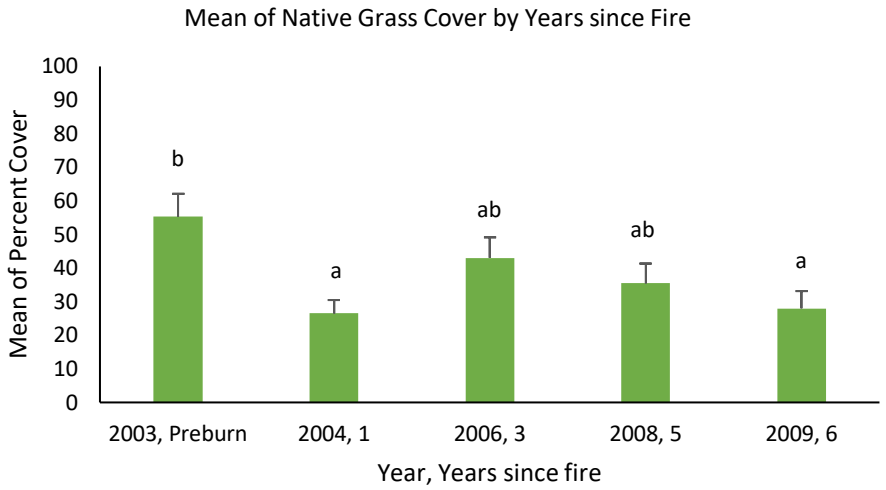
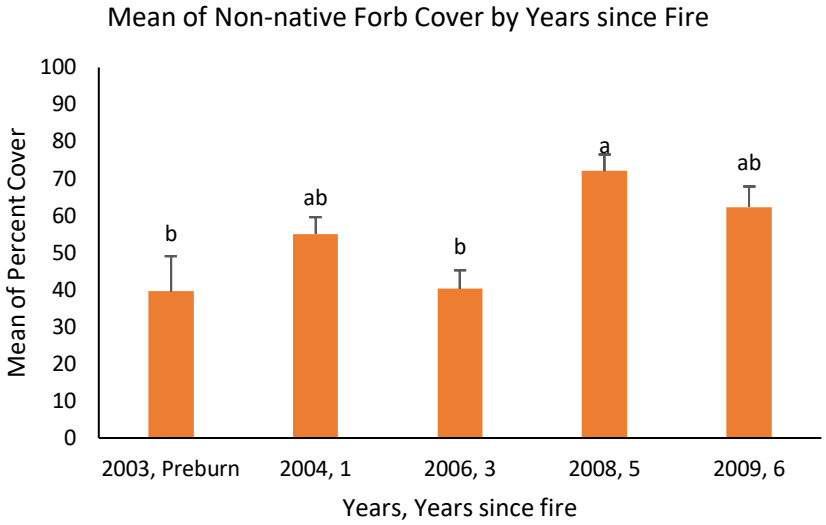


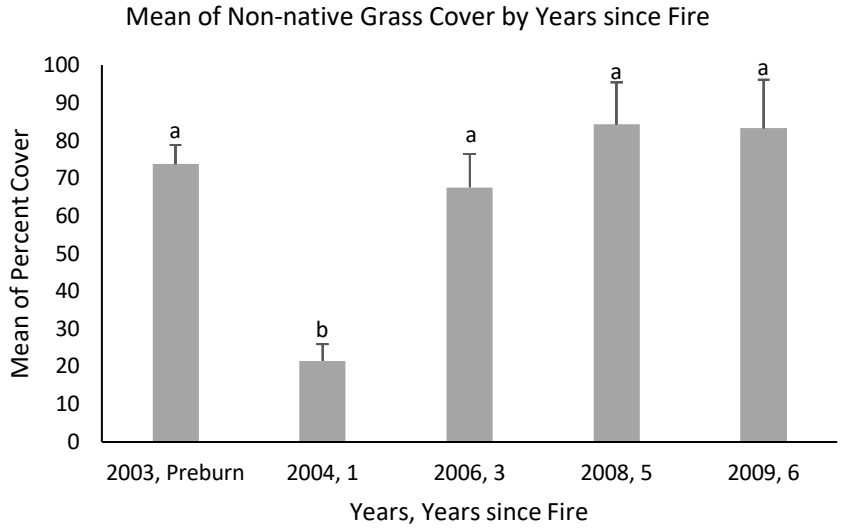
Fire and NNG: 6 years post 2003 Rx fire



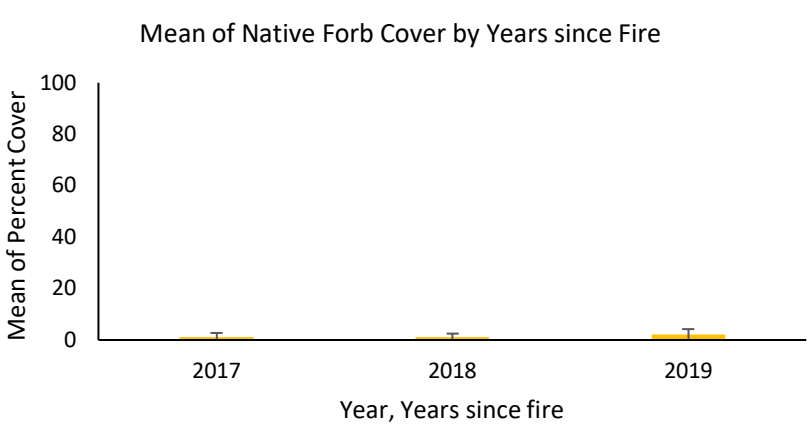


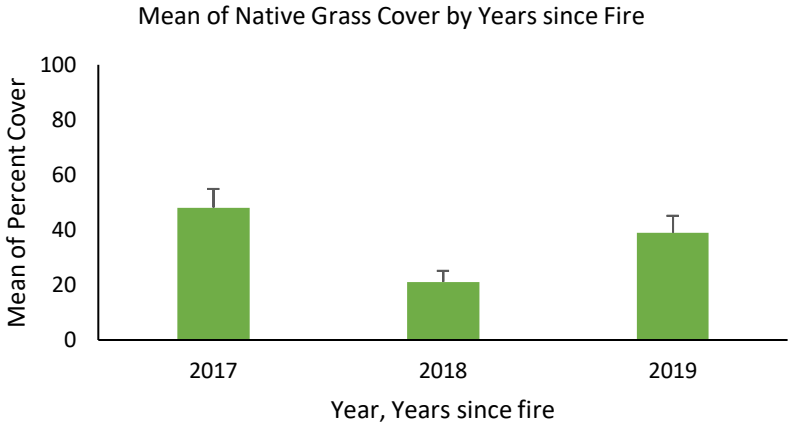
- Significant changes to cover for **NF** and **NNF** (due to precip, not fire), **NG** decreased and never returned to pre-fire totals, **NNG** decreased one year



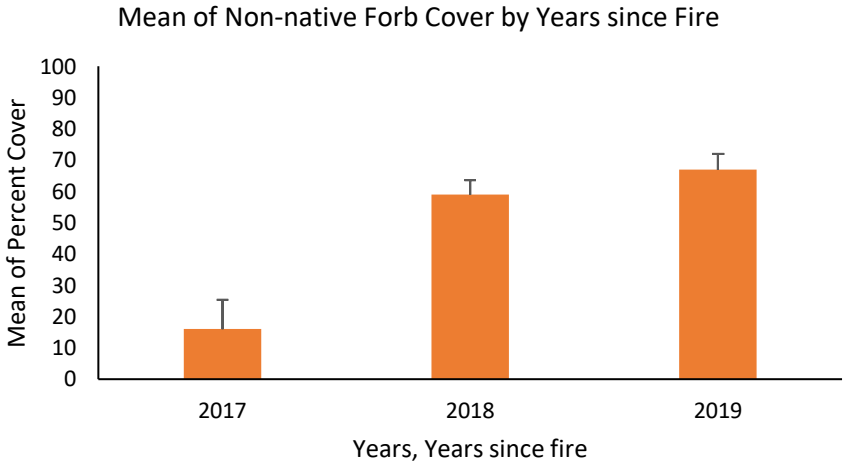


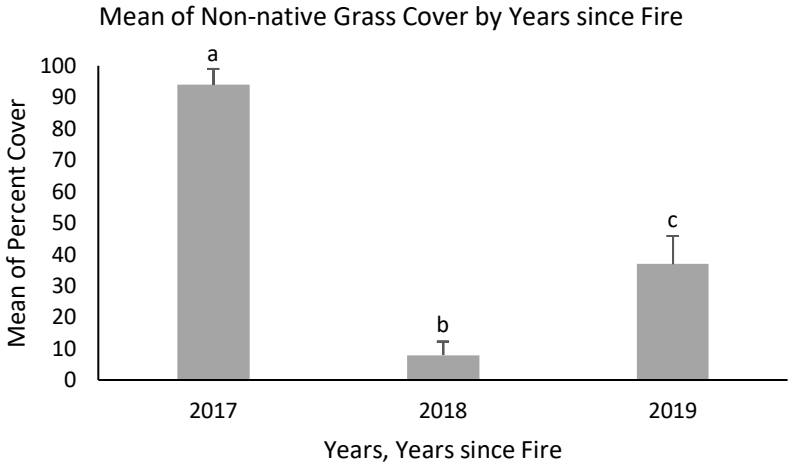
Fire and NNG: Drought





- **NNG** significantly ($p<0.001$) decreased one-year post-fire and was also significantly different the second year after fire. No significant changes in other functional groups.





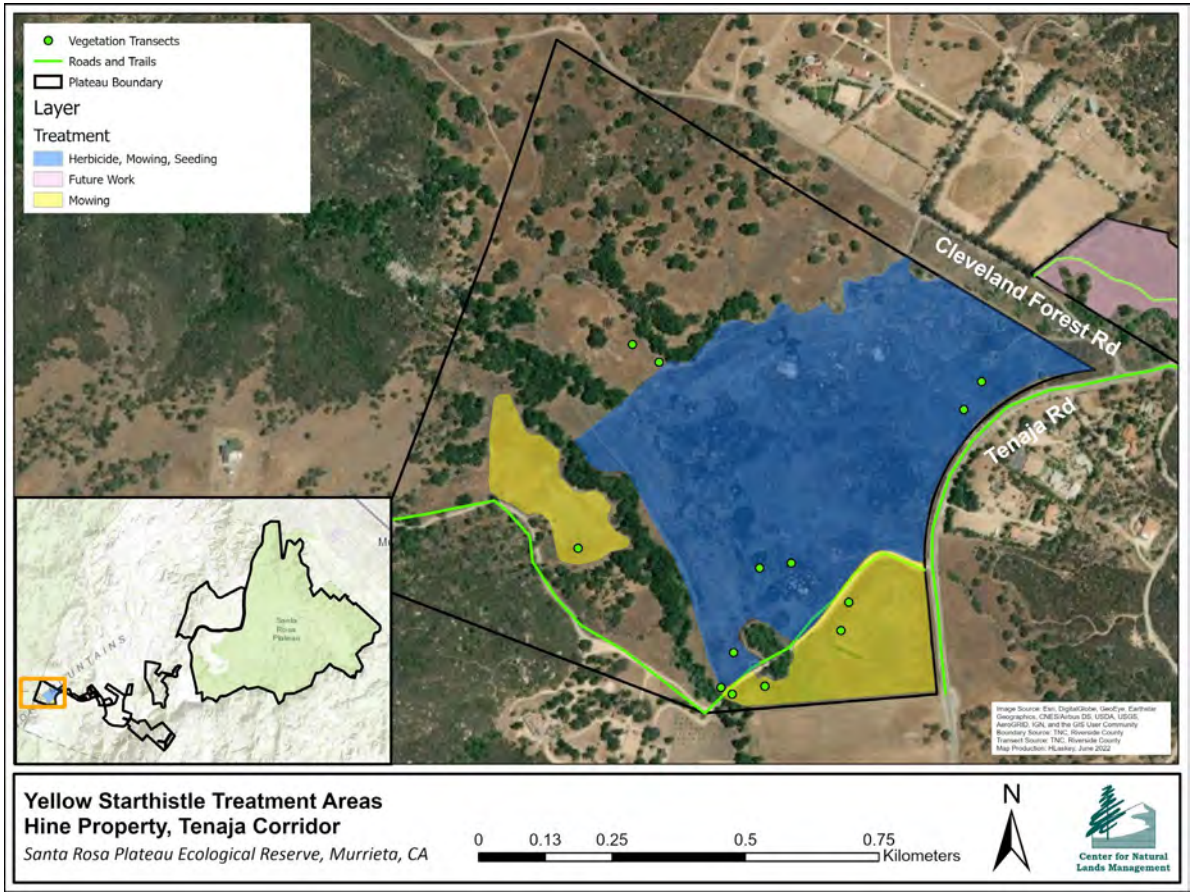
Fire and NNG: Summary

- Prescribed fire is effective at controlling NNG at least one year after fire, especially followed by a dry year
- Not sustainable as a reoccurring tool due to loss in fuel from year to year
- Challenges to timing the fires to target the NNG seeds
- More research and experiments are needed

Fire and Weeds at the Santa Rosa Plateau Ecological Reserve

- Prescribed fire and managing non-native annual grasses
- Prescribed fire and yellow starthistle (*Centaurea solstitialis*)

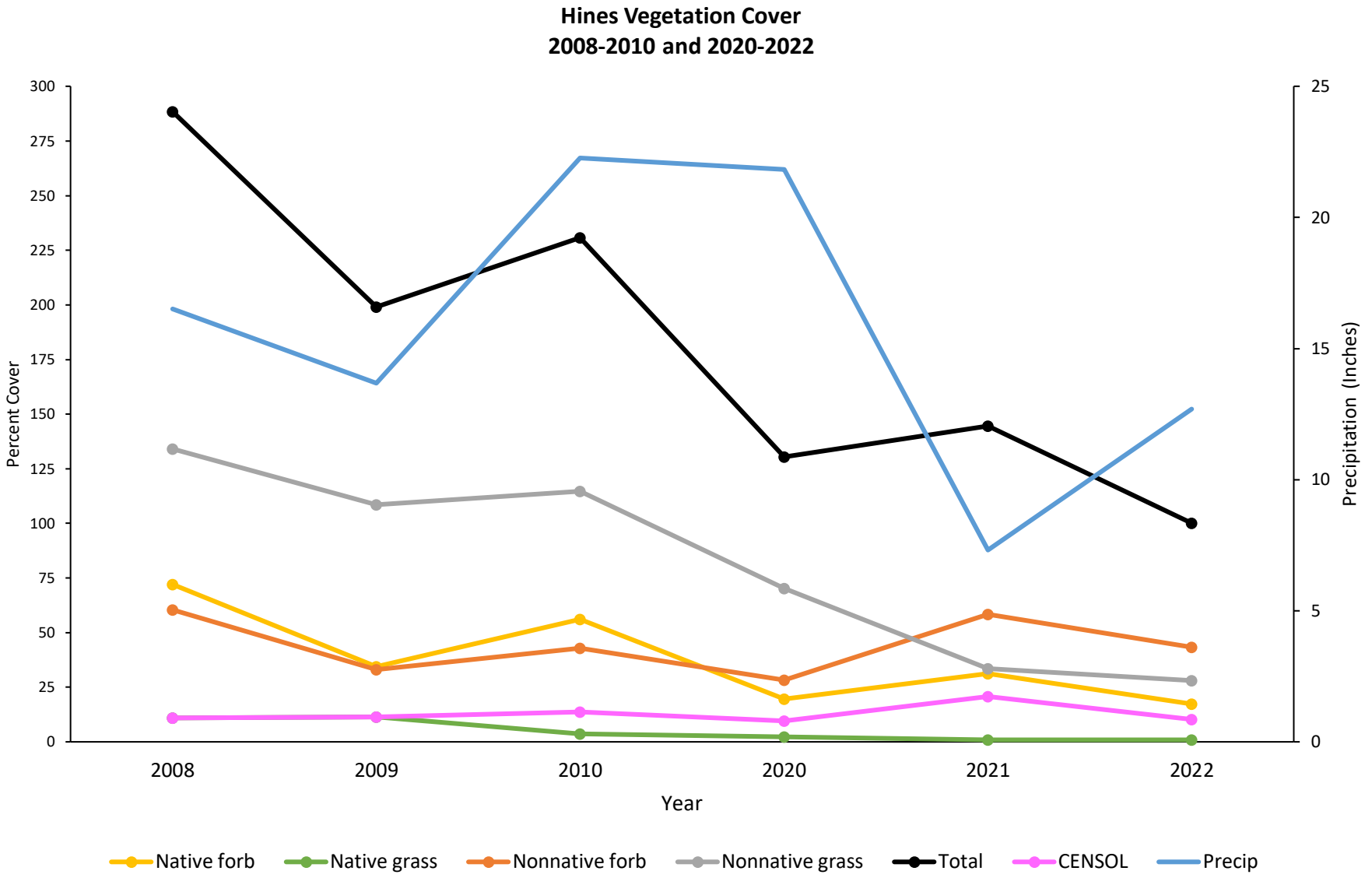
Fire and YST: Hines Treatment Area



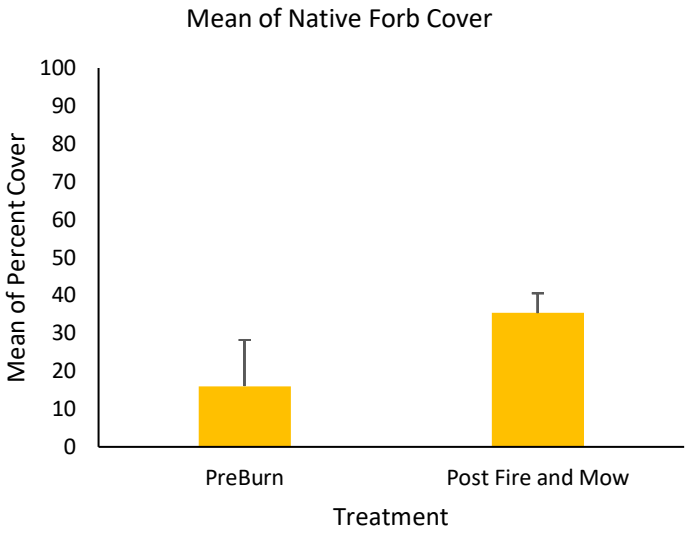
Dead standing YST, blooming YST, and mustards in 2020

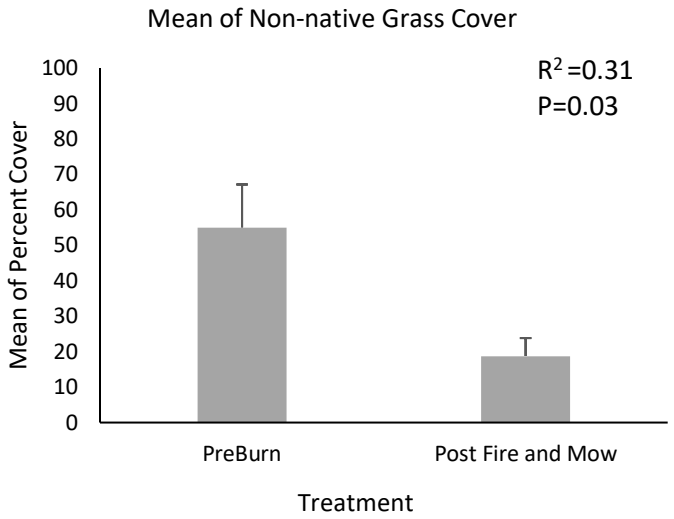
	Treatments in Yellow	Treatments in Blue
2020	Prescribed Fire and Mowing	No treatment
2021	Mowing	Prescribed Fire and Mowing
2022	Mowing	Herbicide and Mowing

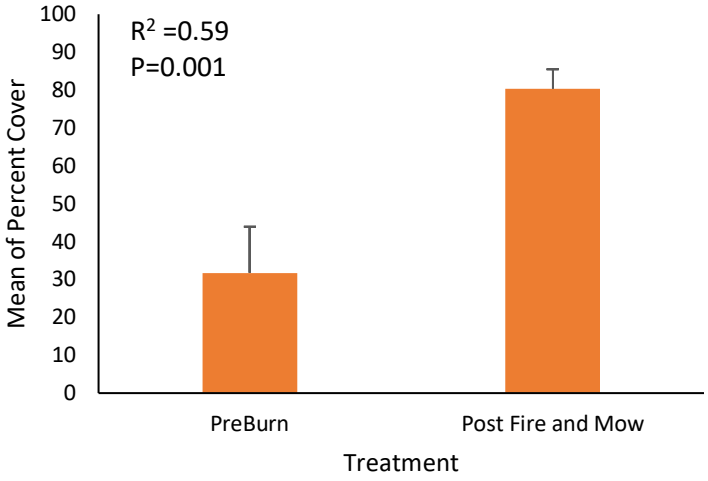
Fire and YST: Vegetation Cover

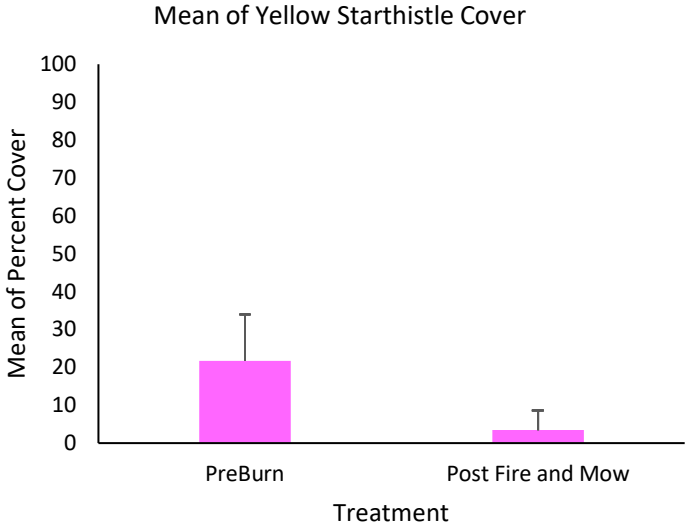


Fire and YST: Cover Before and After



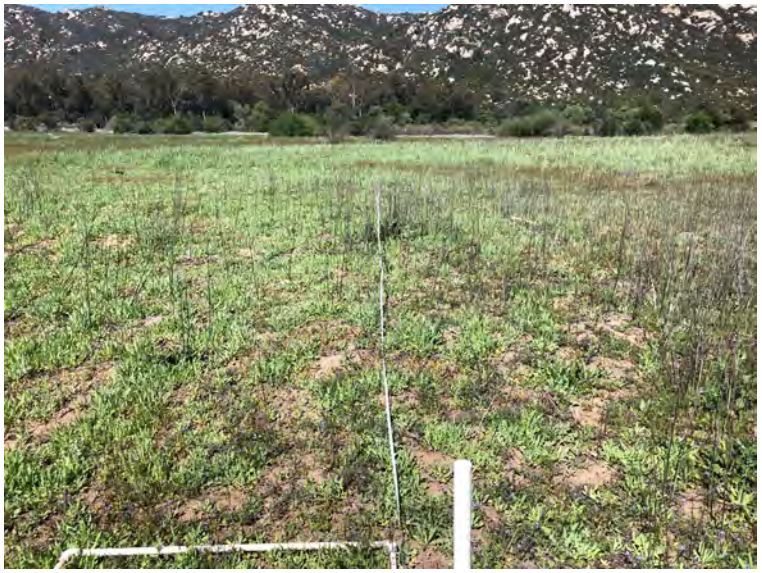




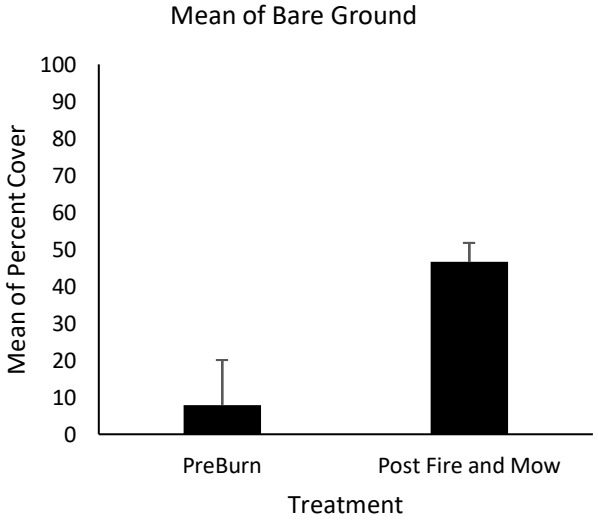


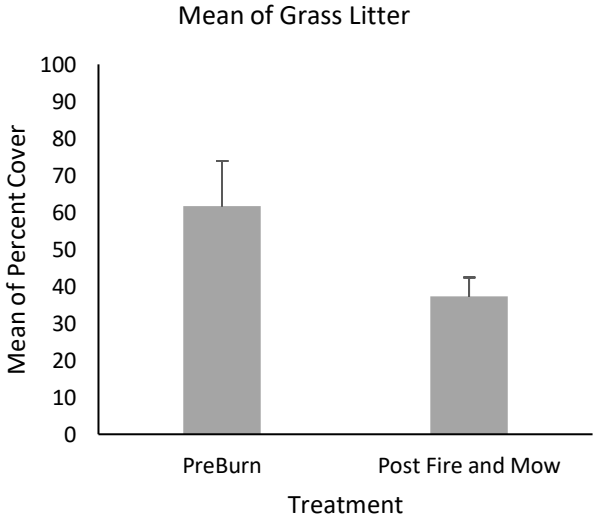
Fire and YST: Ground Cover

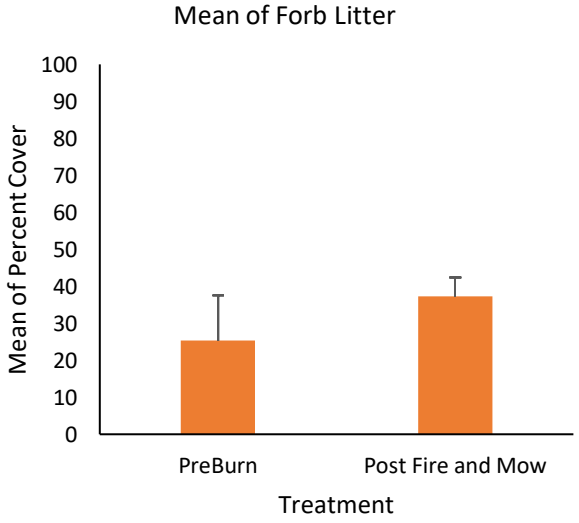
Transect 6 2021 before fire



Transect 6 2022 after fire







Fire and YST: Summary

- Yellow starthistle density is patchy throughout project site, may not be representative in the transects
- Prescribed fire helped reduce NNG cover, but increased NNF cover, and NF cover
- Additional treatments of mowing and herbicide will follow prescribed fire

Fire and Weeds at the Santa Rosa Plateau Ecological Reserve

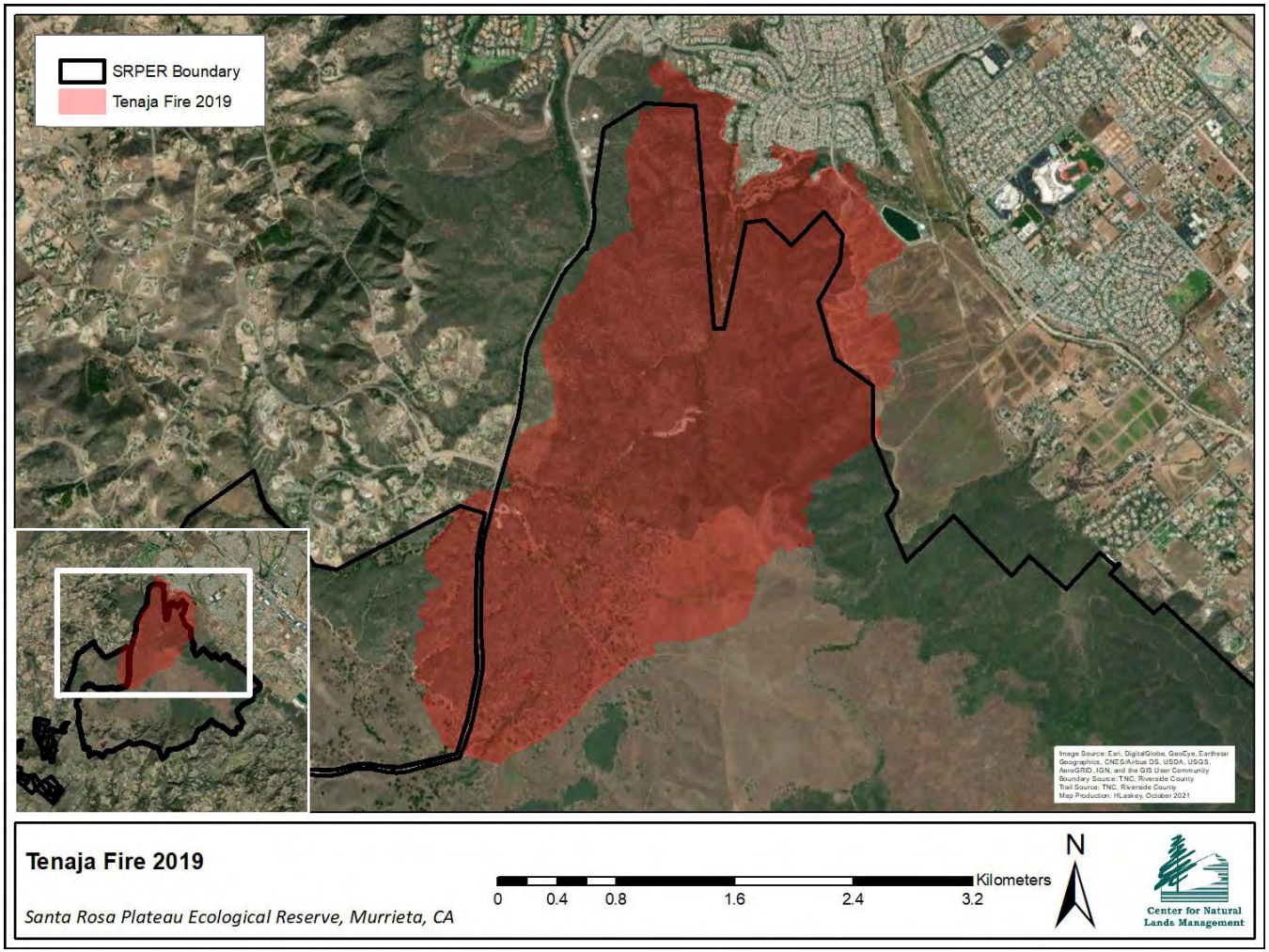
- Prescribed fire and managing non-native annual grasses
- Prescribed fire and yellow starthistle (*Centaurea solstitialis*)
- Managing stinknet (*Oncosiphon pilulifer*) after wildfire

Fire and Stinknet

- Stinknet
  - Annual forb
  - Invades grasslands, roadsides, and post-fire chaparral habitat
- Multiple occurrences at the SRPER after Fire
  - 2021 Hines Prescribed Fire
  - 2021 Wildfire at Vernal Pool Parking Lot 2021 (5 acres)
  - 2019 Tenaja Fire

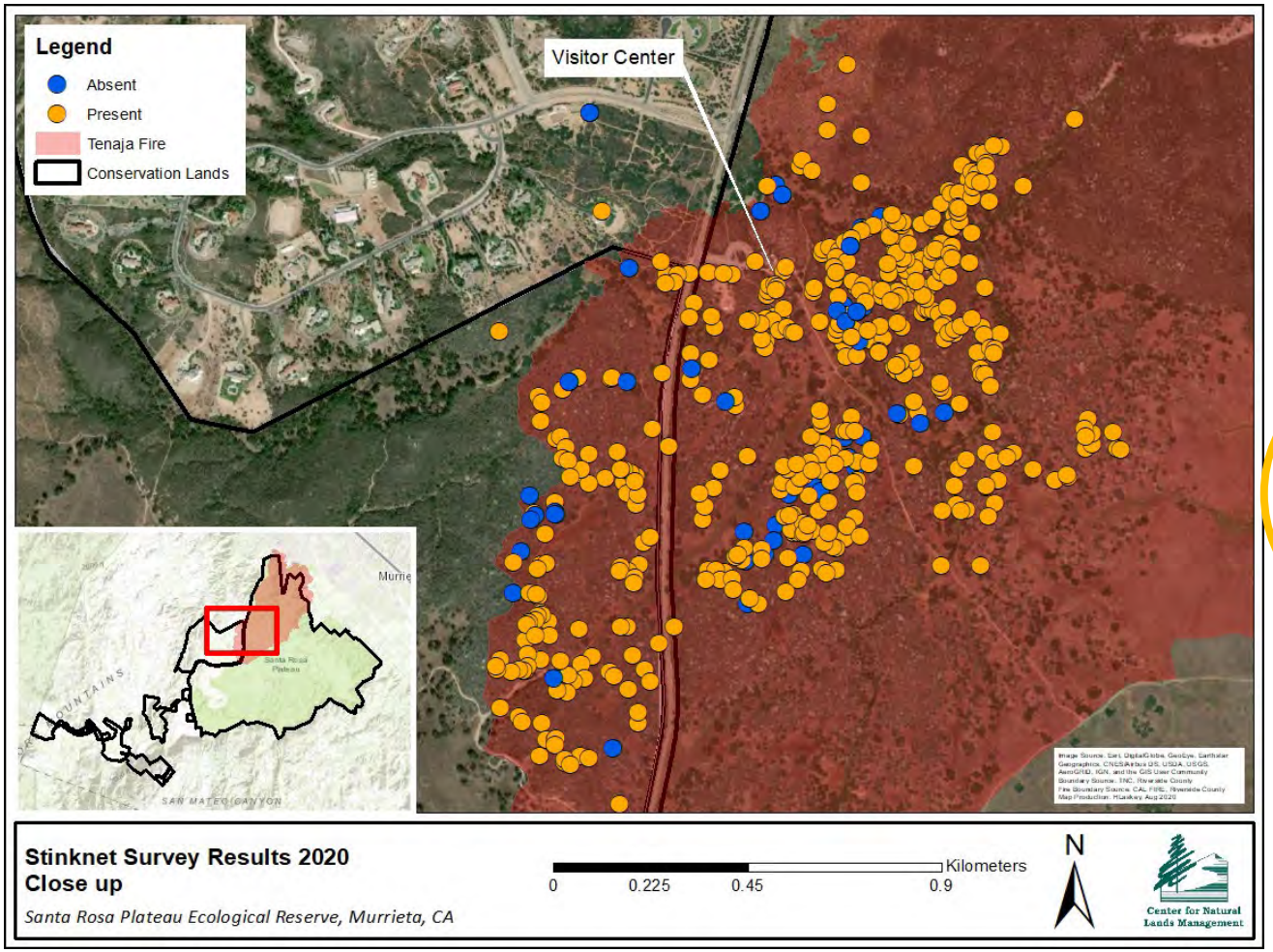
Fire and Stinknet: Tenaja Fire 2019

- ~1,700 acres
- Burned through oak woodlands, grasslands, riparian, and chaparral vegetation communities



Fire and Stinknet: Spring 2020

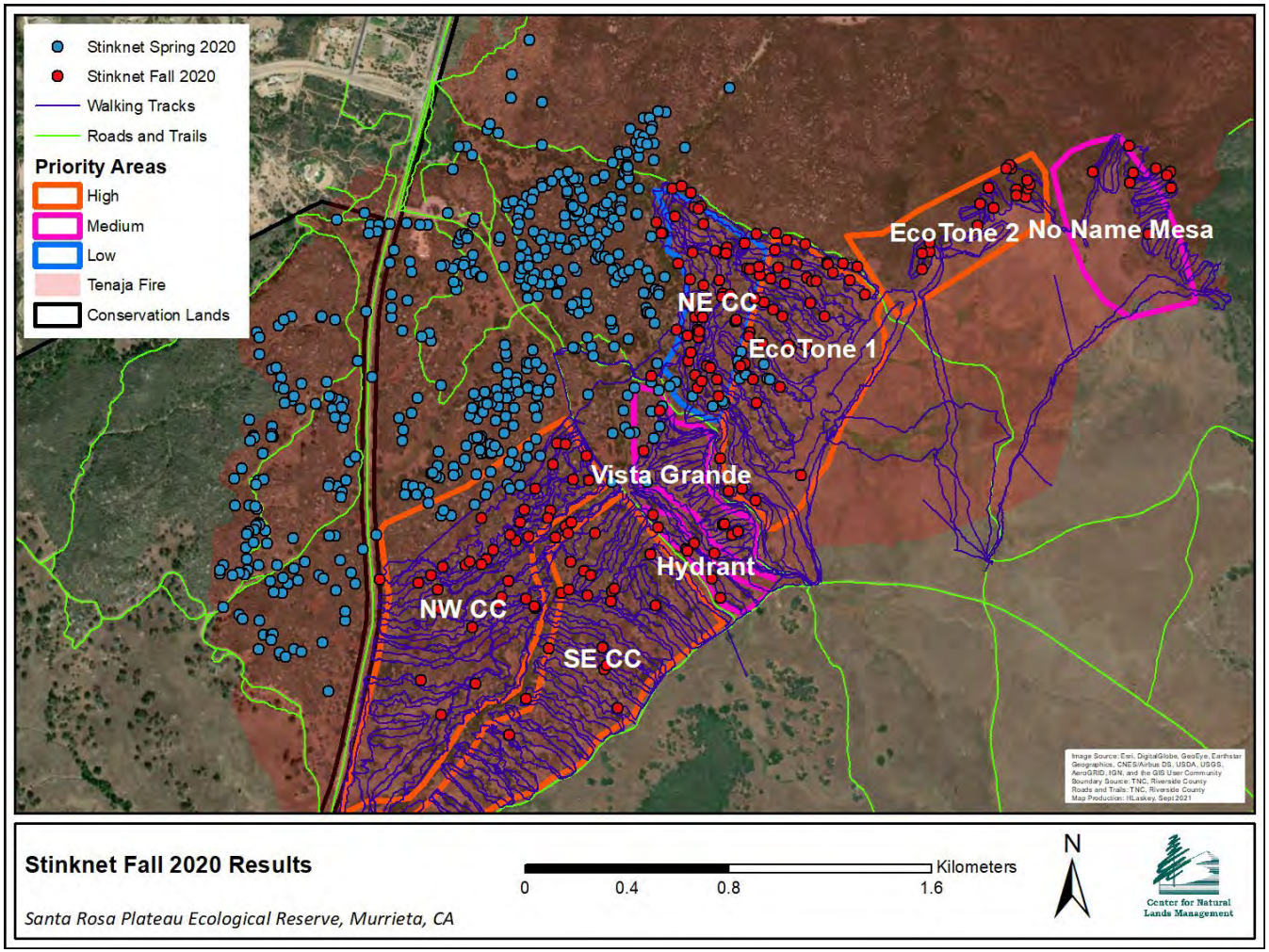
- Detected through Early Detection Rapid Response (EDRR)
- Hand pulled **~500 plants**
- Covered ~400/1,700 acres



Stinknet plants every 25 ft

Fire and Stinknet: Fall 2020

- Created priority areas, walked a grid system
- Found **200 senesced plants**



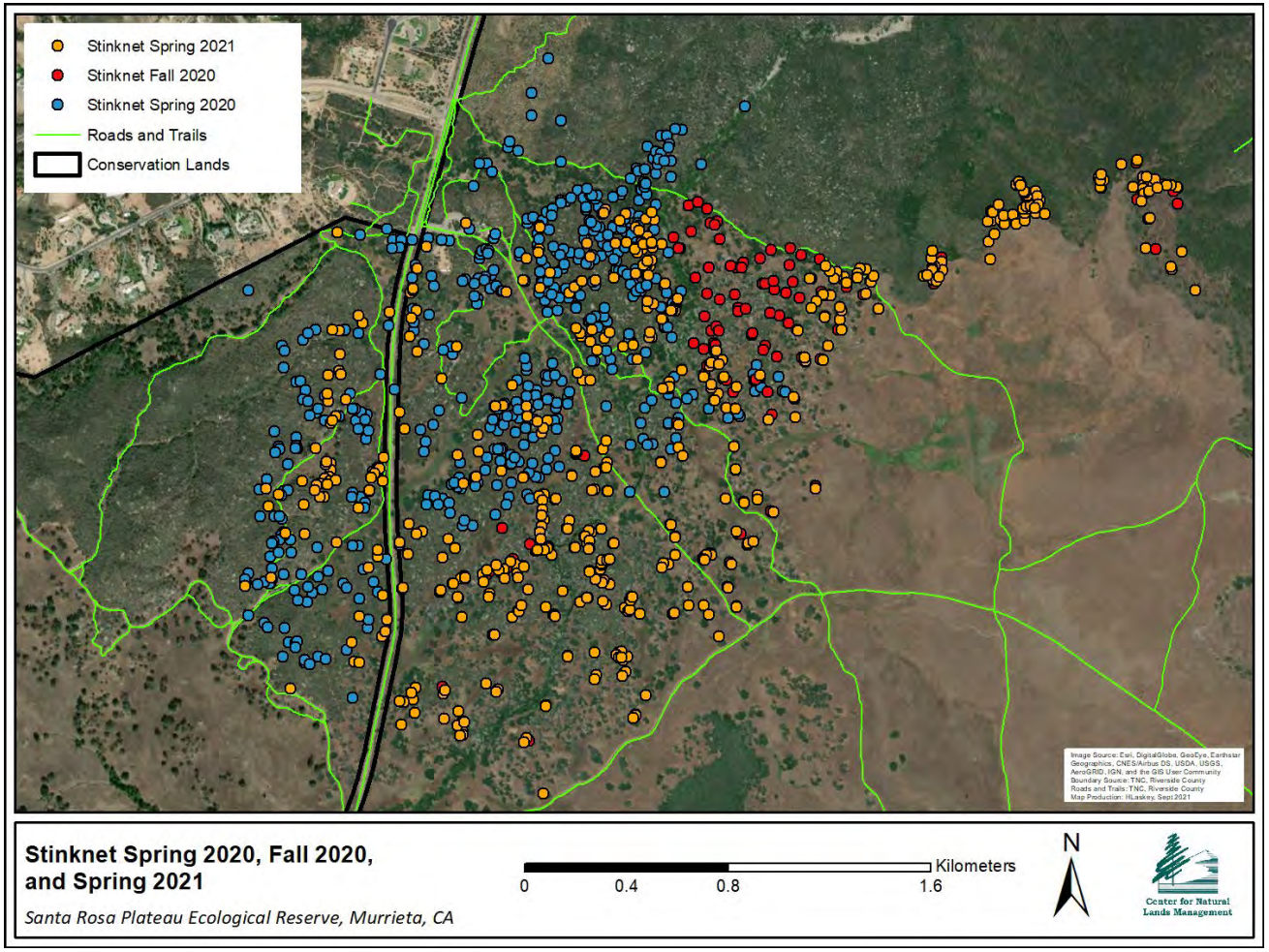
First generation senesced stinknet plant

Fire and Stinknet: Winter 2021

- Manage aerial seed bank
- Sprayed ~1-meter radius around first generation plant with Milestone at a rate of 0.5 oz/acre

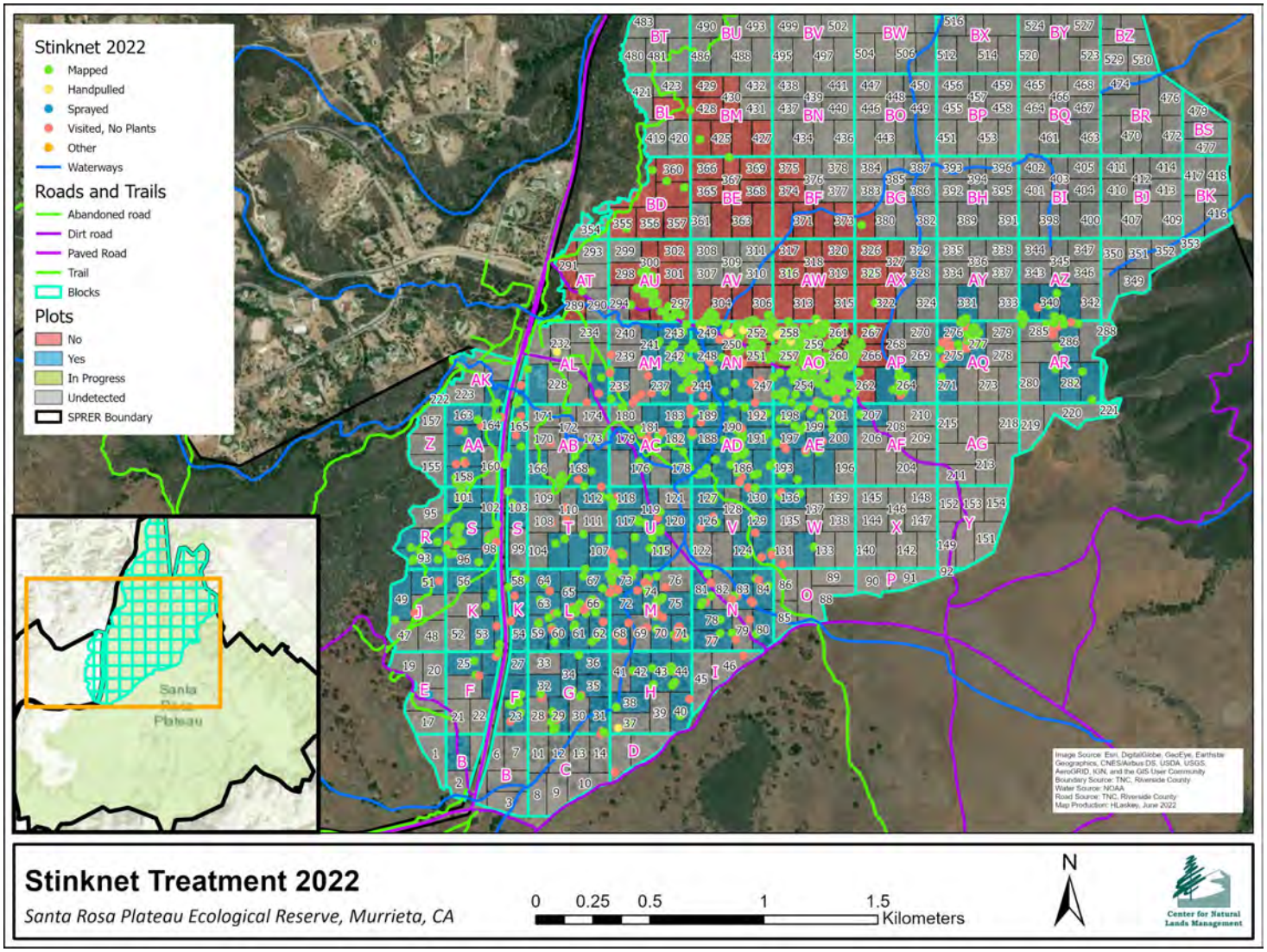
Fire and Stinknet: Spring 2021

- Checked winter herbicide treatments
- Mapped **533 new stinknet points** (first and second generation)



No stinknet!

Fire and Stinknet: 2022 Treatment

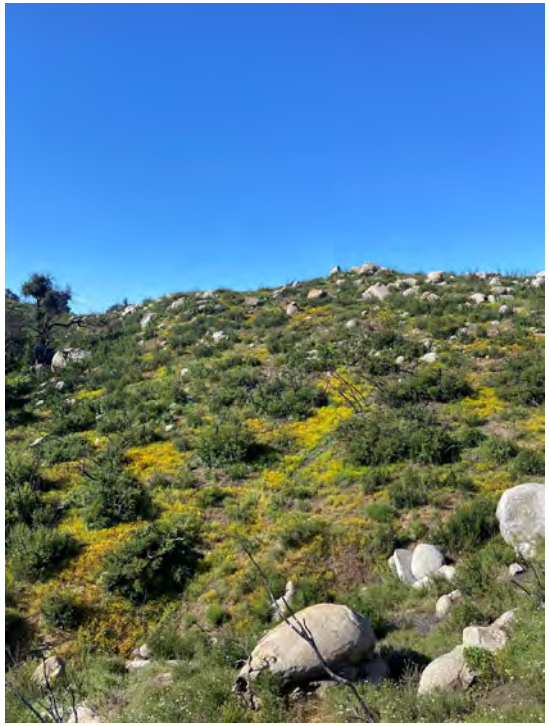


- 652 occurrences checked prior to herbicide treatment Winter 2022
- 446 occurrences treated with Milestone Winter 2022
- Additional 302 occurrences mapped Spring 2022

Fire and Stinknet: Summary

- Stinknet is a strong competitor after fire, but with persistence and a plan can be managed!
- Looking for additional funding for treatment
- Long term planning for managing stinknet

Treated for 2 years with Milestone



Untreated for 3 years

Thank you!

Special thanks to:

- Center for Natural Lands Management Staff
- Zachary Principe—The Nature Conservancy
- California Department of Fish and Wildlife Region 6

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Center for Natural Lands Management

All images were captured by HLaskey and/or KKlementowski