



Lessons Learned: Goats, Goatgrass, Fire, and Fuel Reduction

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November 2018

2.

- Introductions to:
 - Goats
 - Fuel Reduction
 - Goatgrass
- Weed management, wildfire preparedness, grazing



GOATS!

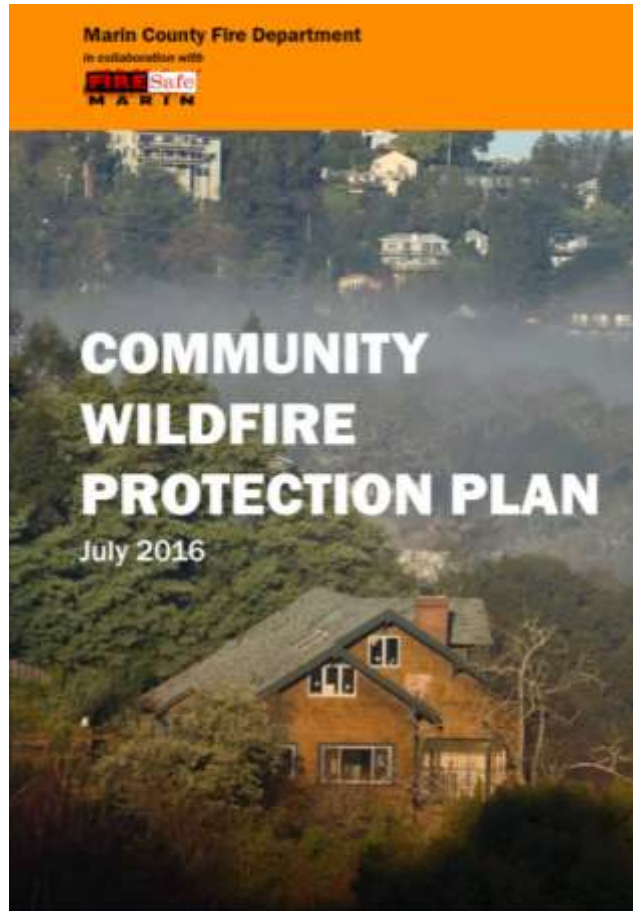
3.



- Super cute
- Eat lots of stuff

WILDFIRE PREPAREDNESS AND FUEL REDUCTION

4.



- Open Space District
 - 34 preserves
 - 16,000 acres
 - 3,400 backyards
- Coordinating with 14 fire service agencies
- Focus of fuel reduction
 - Defensible space
 - Ignition prevention
 - Ingress/egress
 - Fuelbreaks

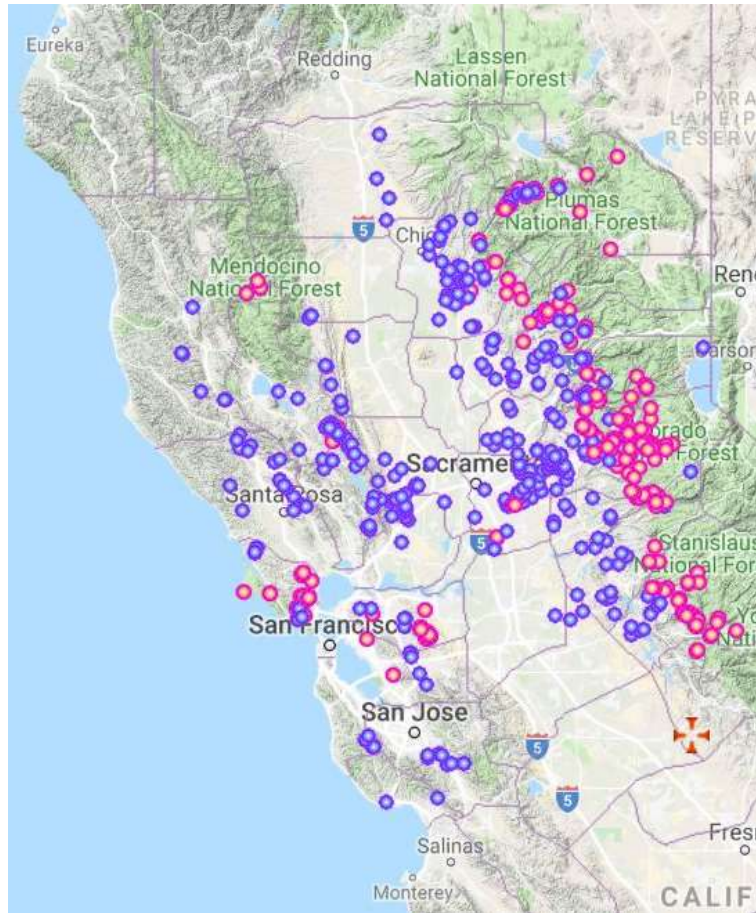
BARB(ED) GOATGRASS (*Aegilops triuncialis*)

5.



- Winter annual
- High threat to annual rangelands
- B-rated agricultural pest in Marin
- Control mandated by the County Agricultural Commissioner
- Threat to serpentine grasslands & rare species

REGIONAL EXTENT



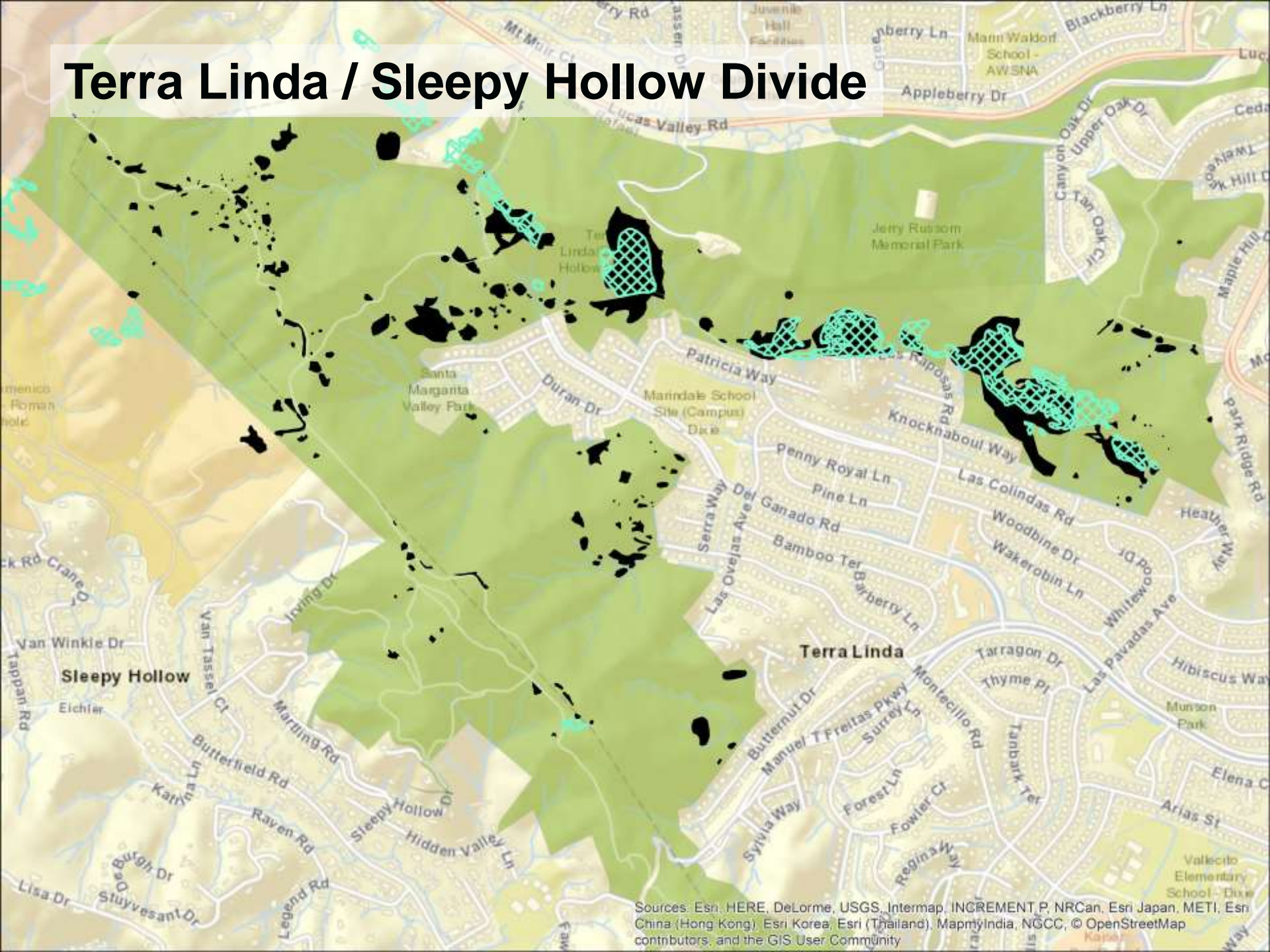
- Oregon to San Diego
- Concentrations in the Central Valley foothills
- Sparse distribution within Coast Ranges

MARIN COUNTY EXTENT

7.



Terra Linda / Sleepy Hollow Divide



Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

PROBLEM

9.

- The largest populations of barbed goatgrass in Marin County are on the serpentine slopes of Terra Linda
- Serpentine grasslands are a refuge for rare species that adapted to the harsh conditions



TREATMENTS – INTEGRATED PEST MANAGEMENT

- Controlled burns
- Weed whipping
- Herbicide treatments
- Flaming
- Grazing
- Hand pulling

10.



CONTROLLED BURNS

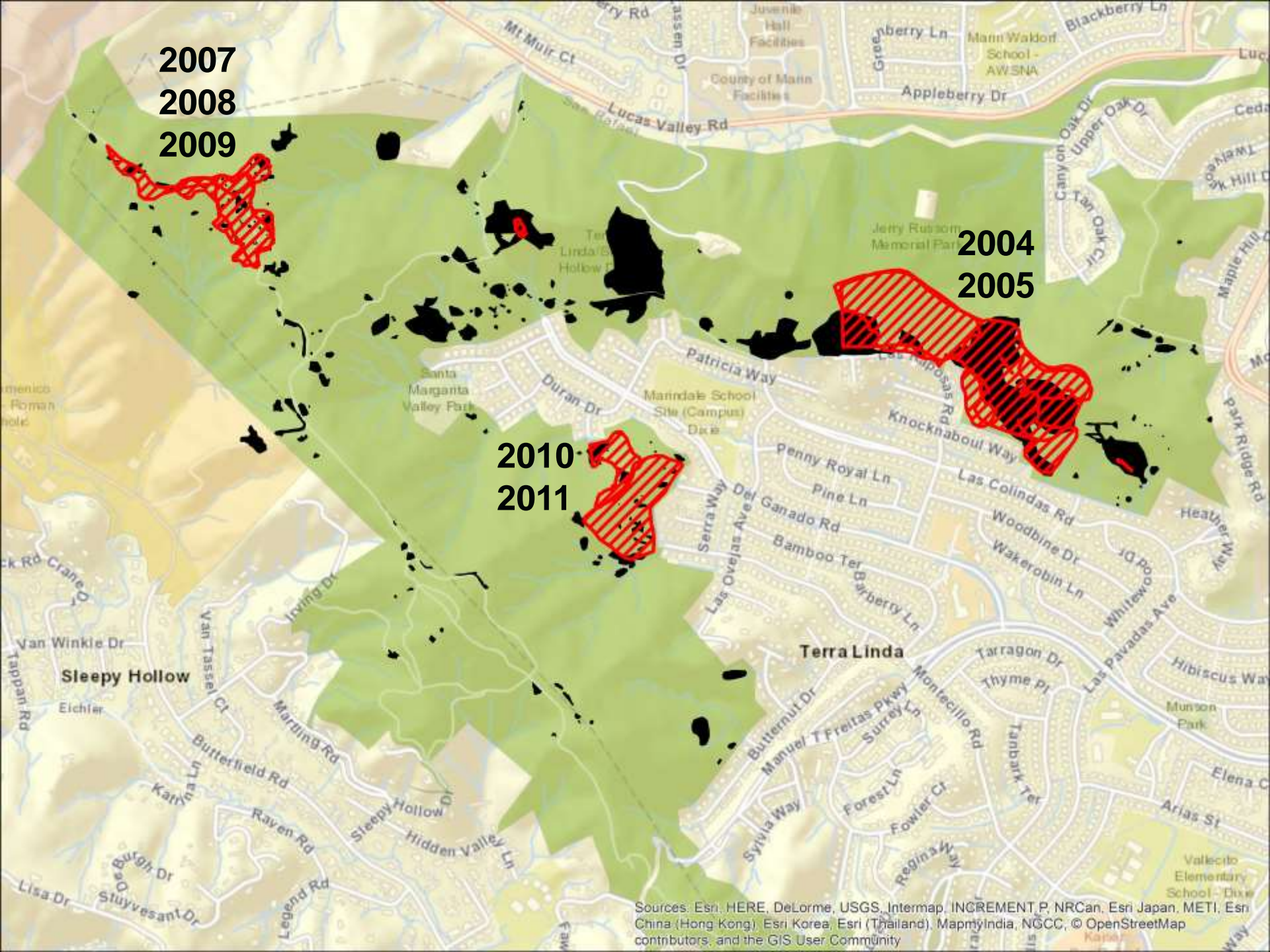


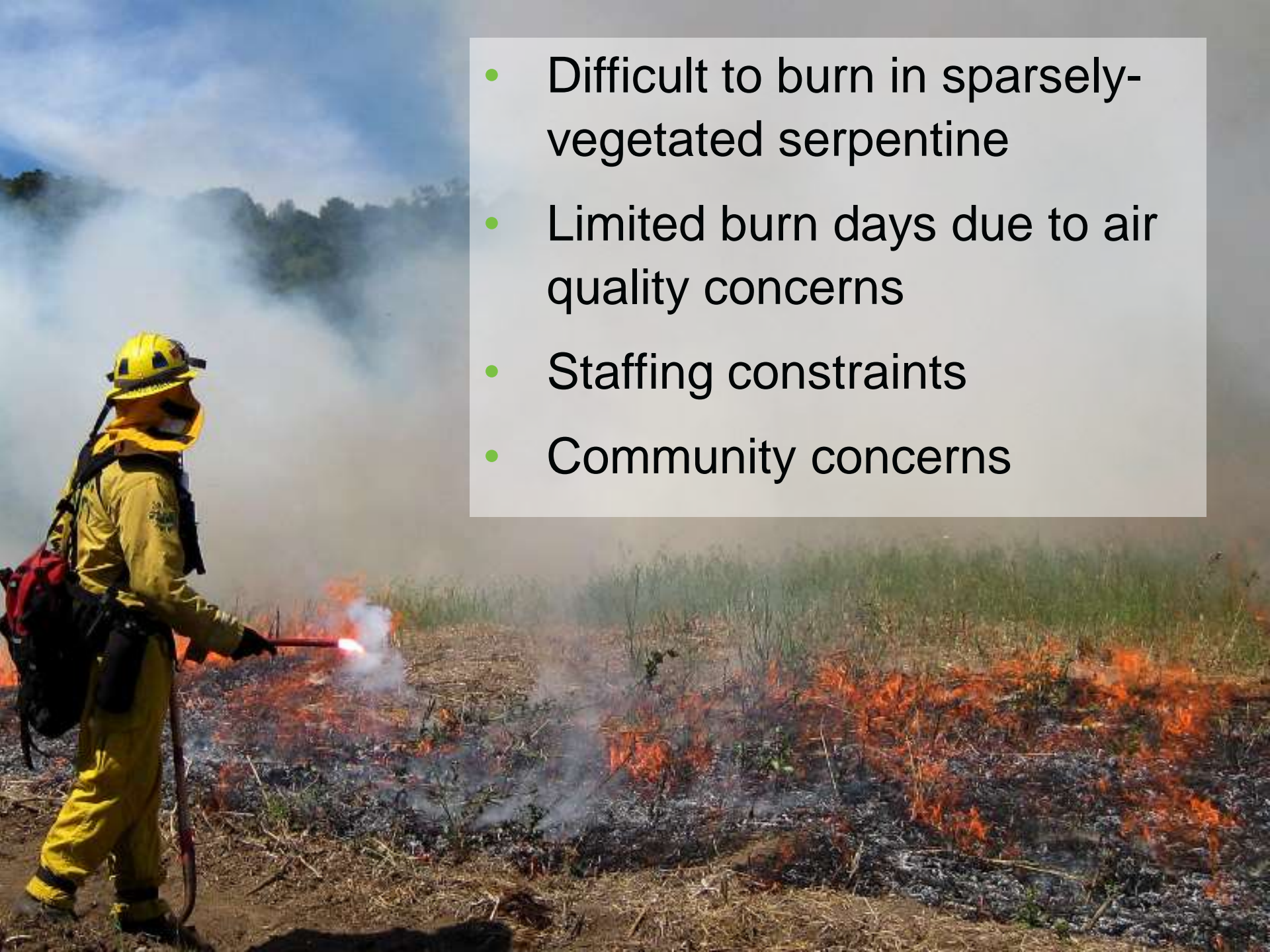
- Most effective treatment
- Can reduce large areas to hand pull sites

CONTROLLED BURNS



- Burning in 2 successive years is best
- Ideal timing: before July when seeds drop





- Difficult to burn in sparsely-vegetated serpentine
- Limited burn days due to air quality concerns
- Staffing constraints
- Community concerns

WEED WHIPPING



- After flowering and before seed is mature
- Large areas and difficult terrain are not feasible

HERBICIDE TREATMENTS



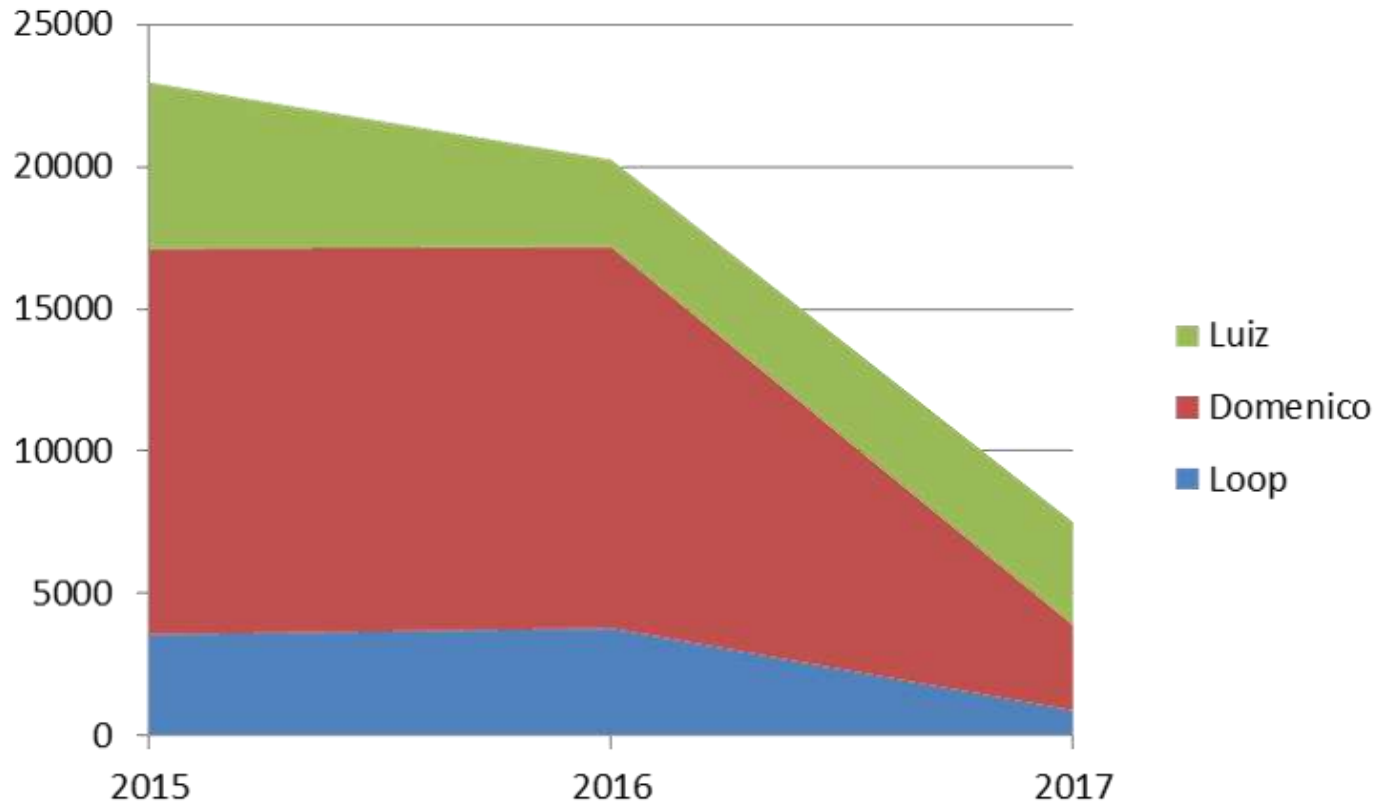
- Broadcast with Fusilade (Nov/Dec)
- Spot treat with Roundup (May)

HAND PULLING



- Hand pull small or sparse areas
- Follow-up treatment in mow and/or herbicide areas

INTEGRATED PEST MANAGEMENT



- Mow, spot spray, hand pull combination works

HERBICIDE TREATMENTS



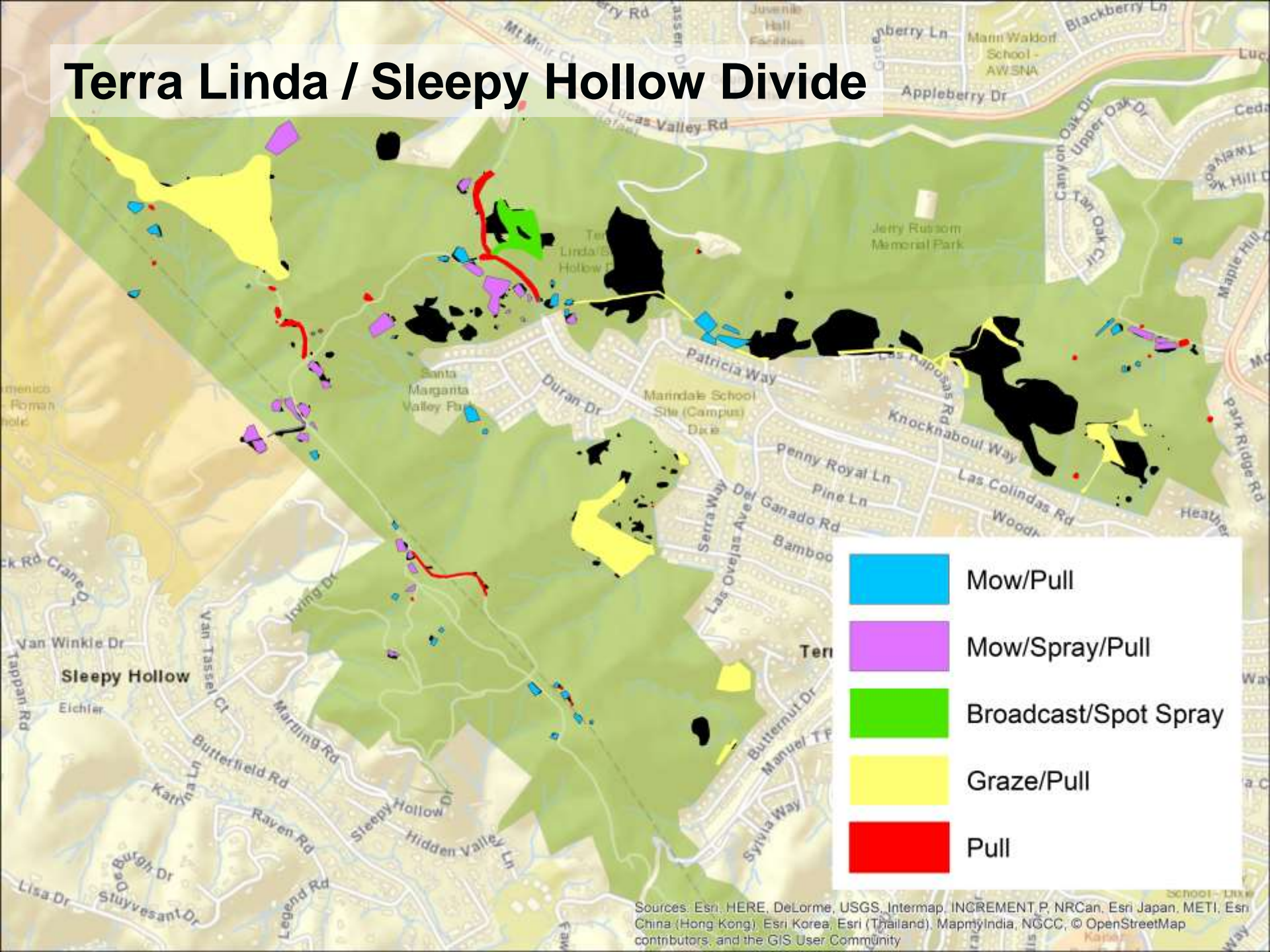
- Goal of reduction in herbicide use
- Potential for secondary forb invasion

FLAMING



- Burn seeds on the ground surface
- Best in sparse vegetation (e.g. serpentine)
- Need dry conditions to burn through dense thatch
- Time-intensive, large areas not feasible

Terra Linda / Sleepy Hollow Divide



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GRAZING

- Large regional grazing partnership
 - Local fire protection district
 - Private ranch lands
 - Private school property
 - Marin County Open Space District



**Rocking H
Ranch**

**San Domenico
School**

**Triple C
Ranch**

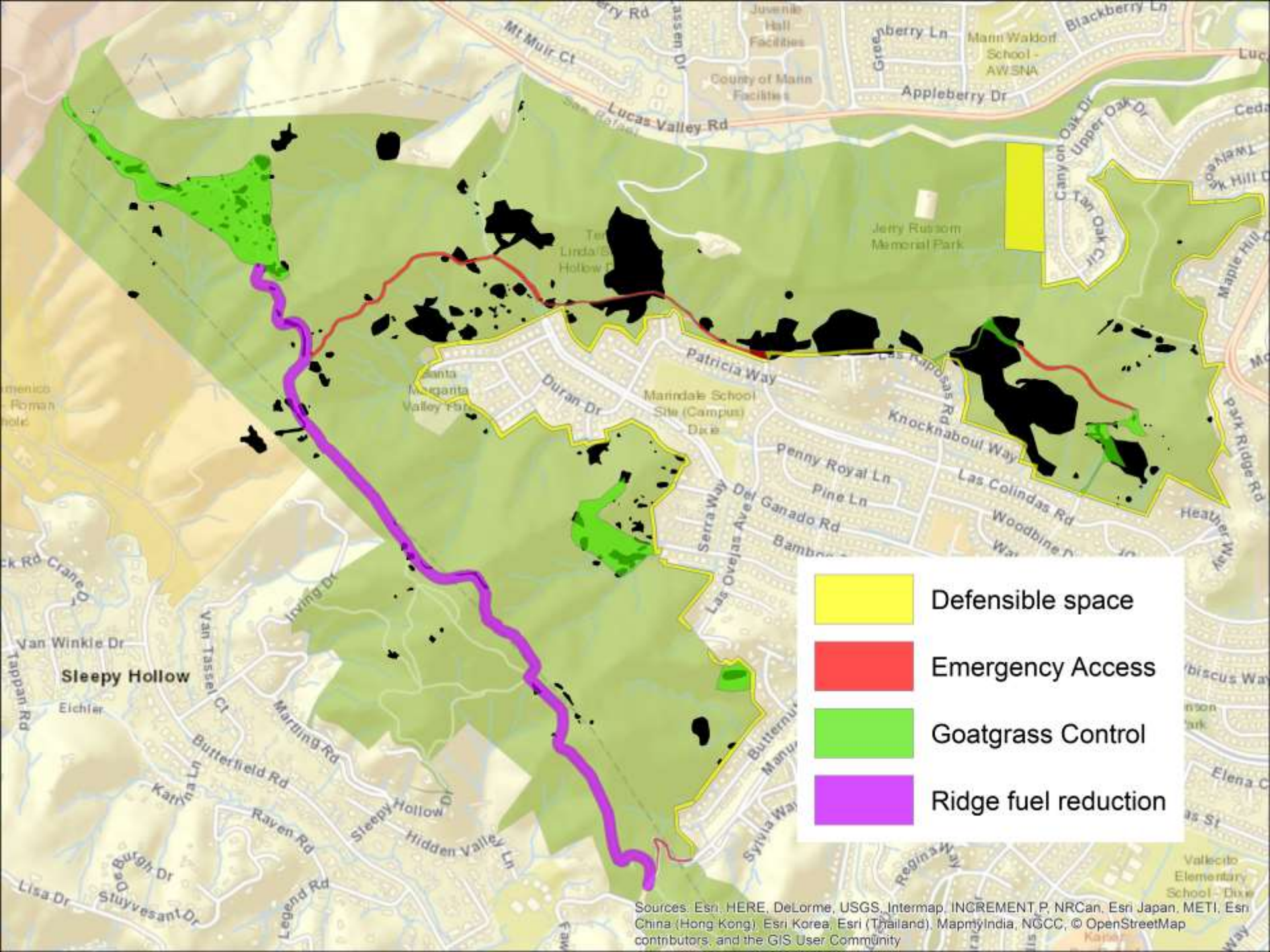
**Terra Linda / Sleepy Hollow
Open Space Preserve**

**Sleepy Hollow
Fire Protection District**

GRAZING



- Total partnership: 200 acres – \$171,900
- 80 acres – 125 days of grazing – \$50,000



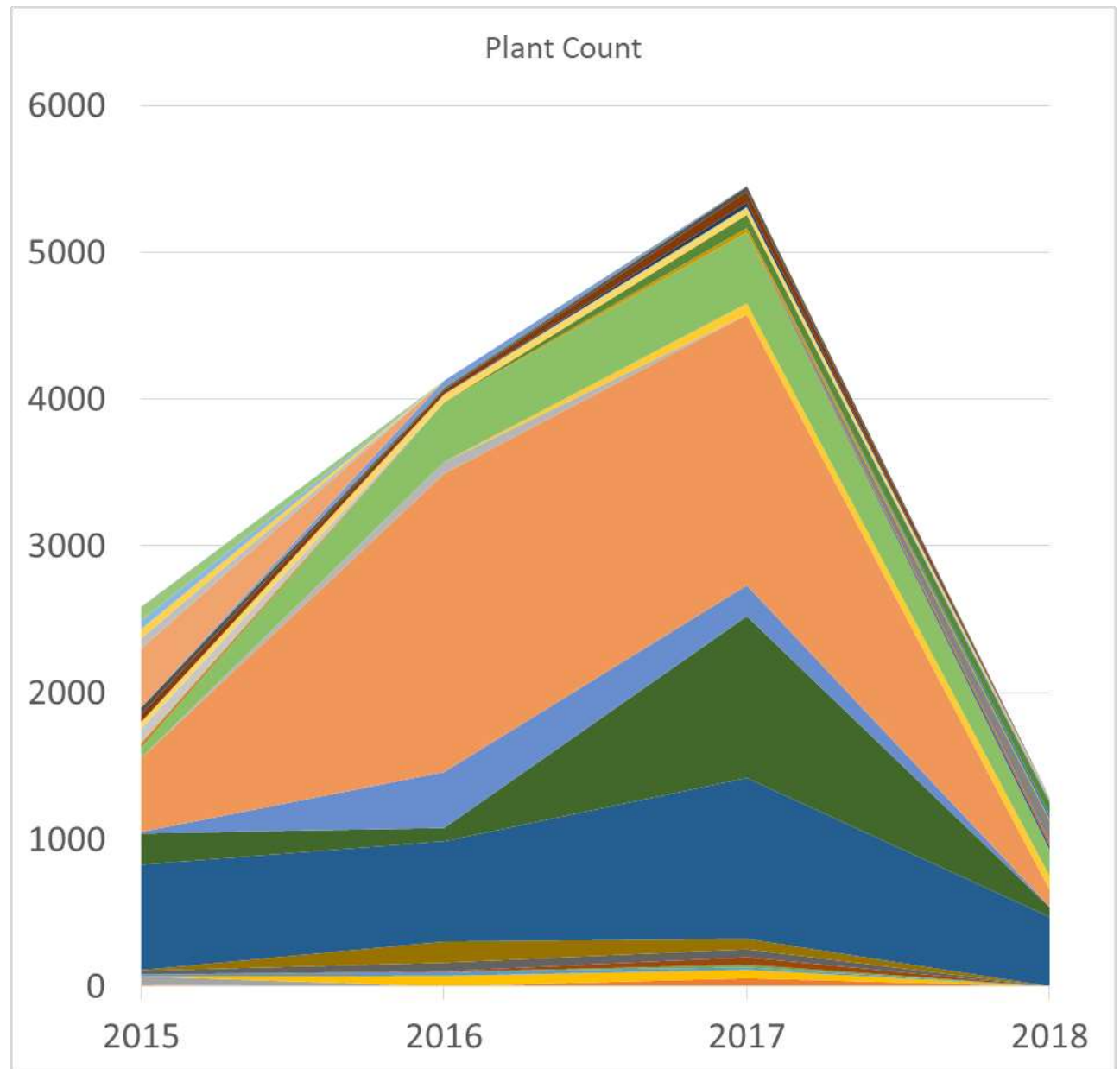
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- 2 herds of 400 animals each
- Wether goat herd + mixed young goats/sheep
- 83 herd days + 43 herd days (April – June)



GRAZING

27.

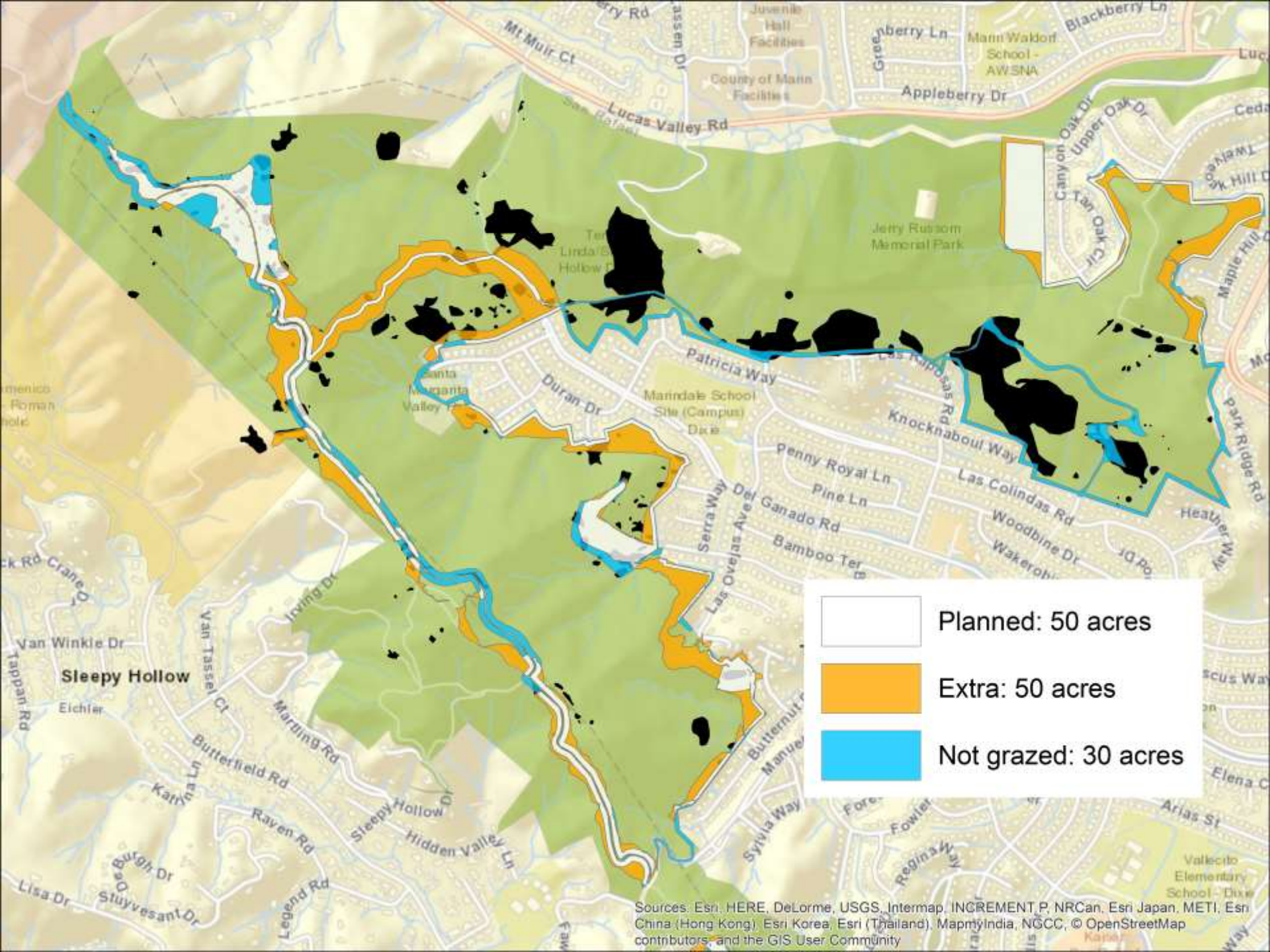


- Intensity and timing are important for goatgrass
- Early grazing grew back; later grazing more effective if grazed heavy
- Potential for increased disturbance
- Too late and the goats are spreading seeds!



- Dense areas took a long time
- Extra areas were grazed
- Some areas skipped – too dense or ran out of time





- Planned: 50 acres
- Extra: 50 acres
- Not grazed: 30 acres

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- Herder logistics – camps, water sources/transport
- Visitor interactions – good, bad, ugly



- Some good stuff was eaten



- Some good stuff was eaten



LOOKING FORWARD

34.

- Continue integrated mow, spot spray, hand pull
- Work with grazing to improve timing and intensity
- Start working toward additional controlled burns
 - Increased fire crew capacities
 - More community awareness around benefits of controlled burns – also more fear of fire
- Continue to partner with adjacent landowners
 - Acknowledge and work to minimize trade offs between multiple goals
 - Pursue opportunities to coordinate on weed management goals (containment, early detection)



Thank you

Pete Frye
Sleepy Hollow Fire Protection District
Rocking H Ranch
Triple C Ranch
Starcreek Land Stewards
Go Native
Marin County Parks Resource Seasonals

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