

**Treating alpine invaders:  
prioritizing high elevation non-  
native species to protect  
Yosemite's alpine meadow  
ecosystems**

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# High elevation meadows—high value habitat



- Support systems of the region
- Small segment of the land, big impact
- Protecting an intact system

(Kuhn et al. 2015; Moore et al. 2000)

# Wildlife Habitat

**Left to Right:** Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*), Yosemite toad (*Anaxyrus canorus*), Sierra Nevada yellow-legged frog (*Rana muscosa*)



(NPS 2016, Stebbins 2003)



# High elevation weeds—It's a problem?!

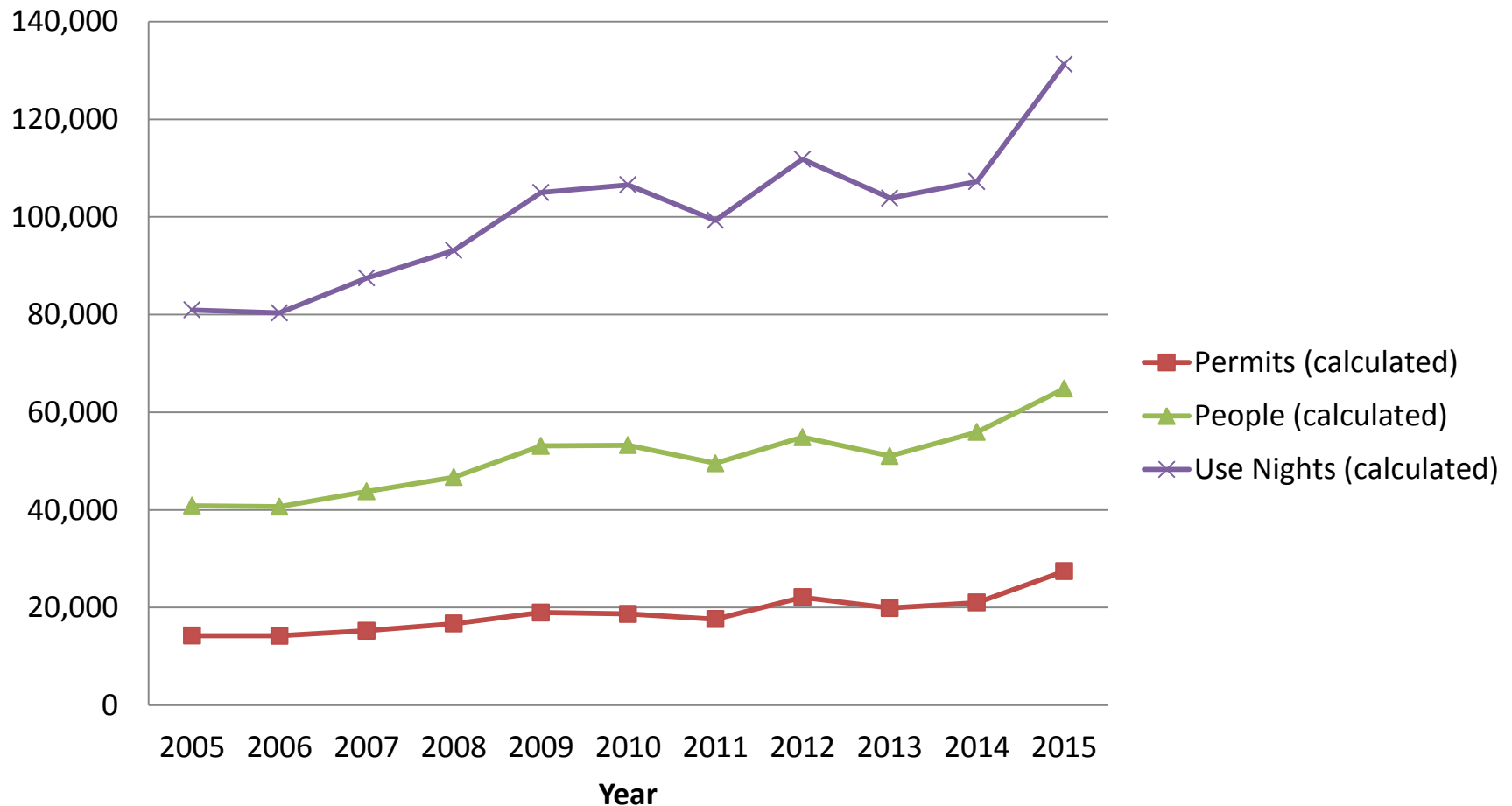
- Short growing season
- Low propagule pressure
- Low resource availability



(Alexander et al. 2015, Pauchard et al. 2009)

# Rising threats—Increased visitation

Yosemite wilderness visitor and use-night trends from 2005-2015



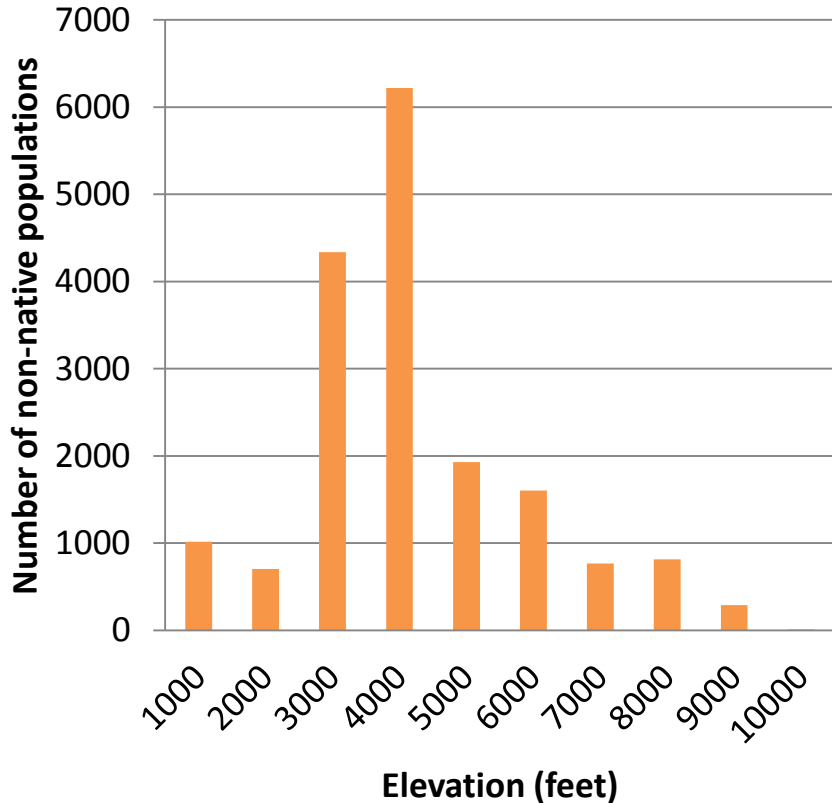
# Rising Threats—Climate Change



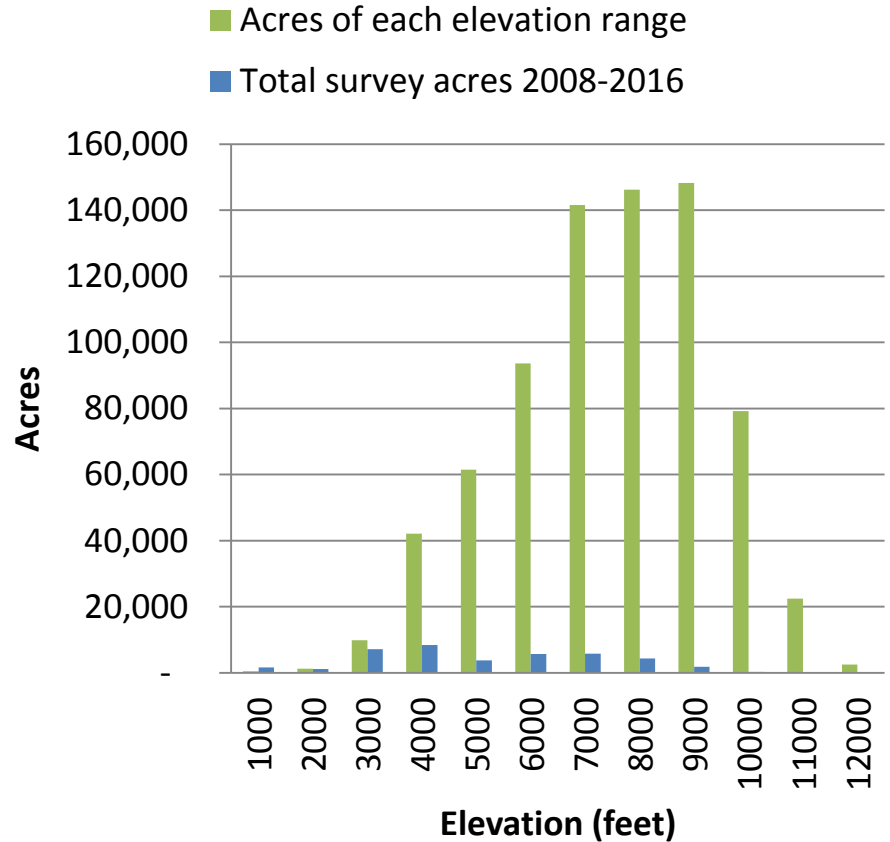
(Griffith & Loik 2010)

# Why Choose 7000 feet?

Number of populations of non-native plants in Yosemite National Park by elevation

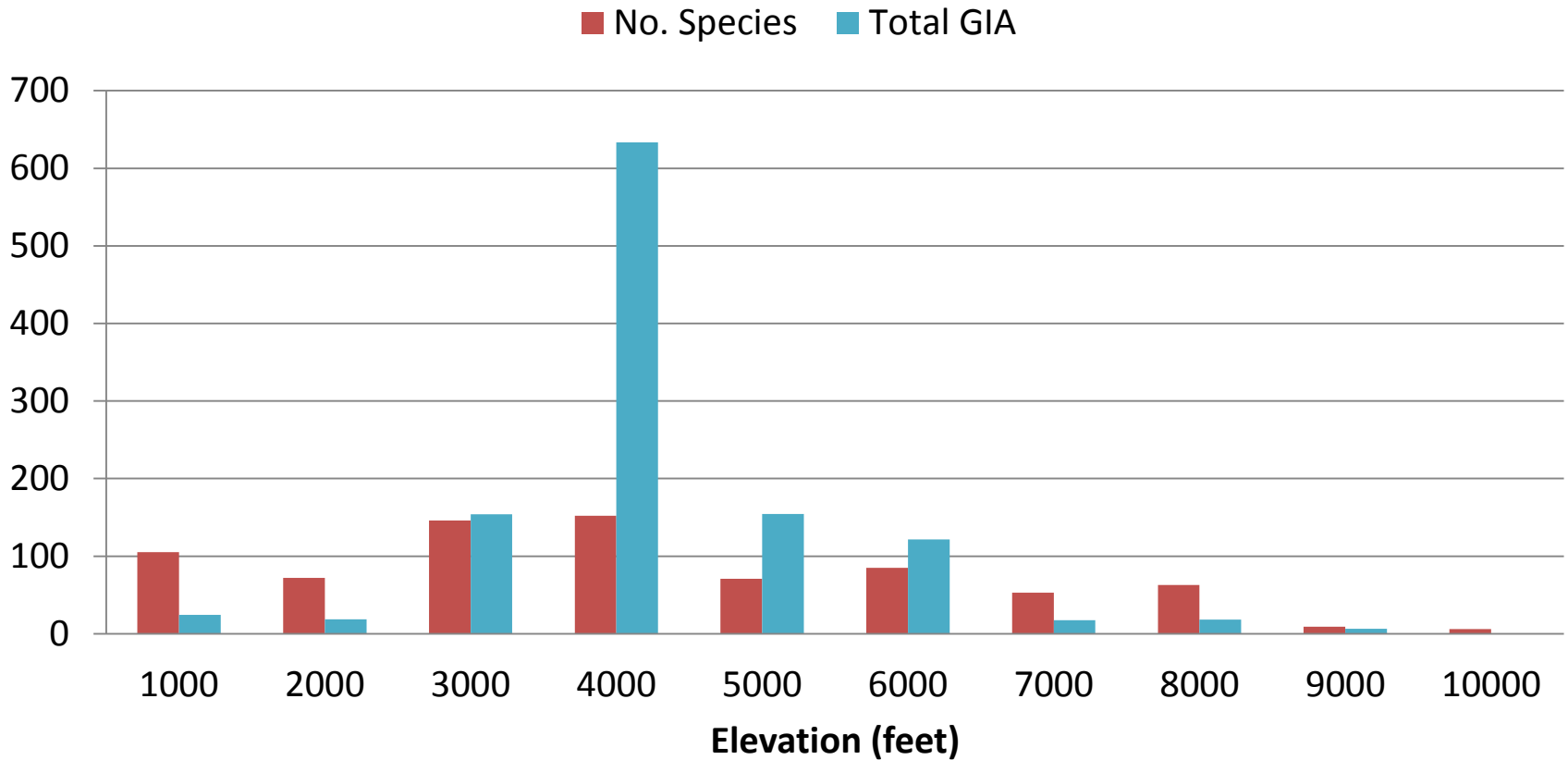


Acres of each elevation range and total acres surveyed from 2008-2016 in Yosemite National Park



# Why 7000 feet continued

Number of non-native species & gross infested acres in Yosemite National Park by elevation





# The most effective part of weed treatment—early detection—rapid response

## BEFORE

- 84 high elevation species
- 29 had only one population

## AFTER

- 11 species reduced to one population
- 32 species eradicated?

# Significant Findings-Holcus lanatus treatment

Before



After





# Significant Findings—Never ending dandelion

- Dandelion
  - 2014 8.17 Acres
  - 2015 10.75 Acres
  - 2016 24.66 Acres



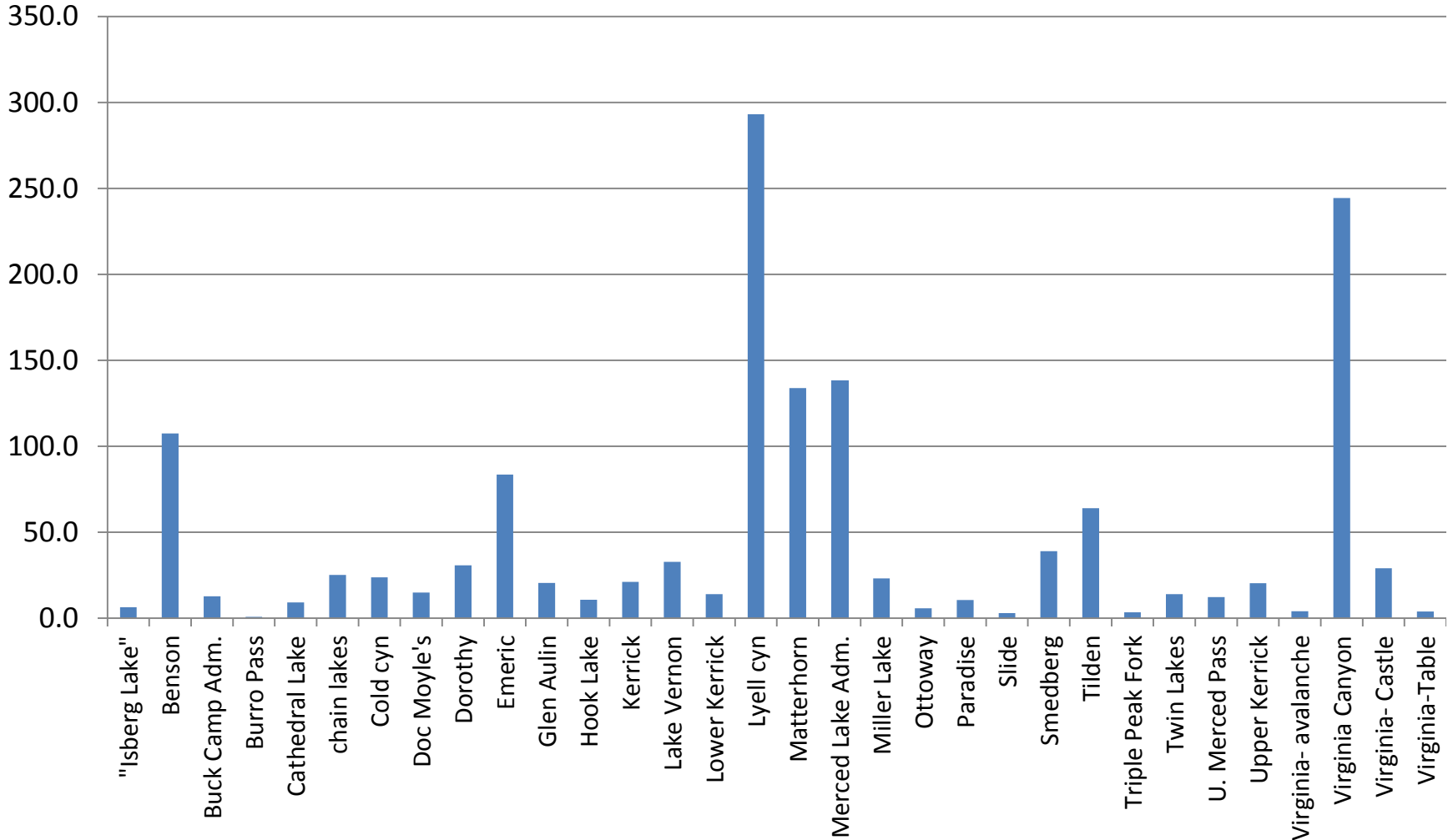
# Where do we find weeds



- Stock corrals
- Stock grazing areas
- Gravel pits



# Average Stock Use Nights Per Meadow from 2004-2013



# Where we didn't get there early enough

## Populations of each Species

- *Taraxacum officinale*-749
- *Rumex acetosella*-142
- *Spergularia rubra*-90
- *Bromus inermis*-84
- *Lactuca serriola*-74
- *Bromus tectorum*-70
- *Tragopogon dubius*-69
- *Lepidium virginicum*-56
- *Poa annua*-44
- *Phleum pratense*-35





# Not just a local problem—Species found in other alpine habitats

- 10,000 feet
  - *Phleum pratense*
  - *Poa annua*
  - *Rumex acetosella*
  - *Taraxacum officinale*
- 8,000 feet
  - *Capsella bursa-pastoris*
  - *Dactylis glomerata*
  - *Holcus lanatus*
  - *Plantago lanceolata*
  - *Poa pratensis*
  - *Polygonum aviculare*
  - *Sonchus asper*
  - *Stellaria media*
  - *Trifolium repens*

# Lessons learned



- High elevations are vulnerable
- Start survey and treatment now!
- You can be effective at EDRR and prevention
- Follow stock if you want to find weeds

# Many thanks to

- Yosemite Conservancy
- Justin Rice-alpine explorer extraordinaire
- Yosemite resource management staff
- Hardworking volunteers



YOSEMITE  
CONSERVANCY





# Questions?



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