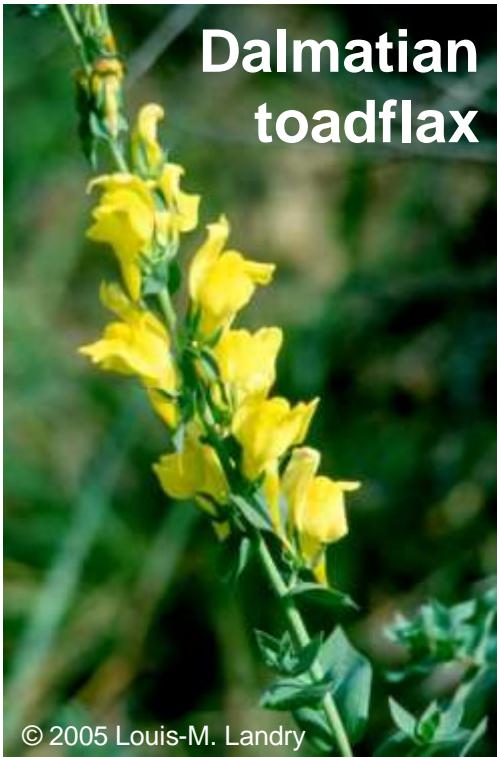


Biological control of Dalmatian toadflax by the weevil *Mecinus janthiniformis* at Hungry Valley

Dalmatian
toadflax



Lincoln Smith¹, Patrick J. Moran¹,
Dale M. Woods², Michael J. Pitcairn²
and Chris Hon³

stem weevil
Mecinus janthiniformis



N. Poritz

- 1) USDA Agricultural Research Service, Albany, CA
- 2) CDFA, Meadowview, CA
- 3) Hungry Valley State Recreational Vehicle Area, Gorman, CA

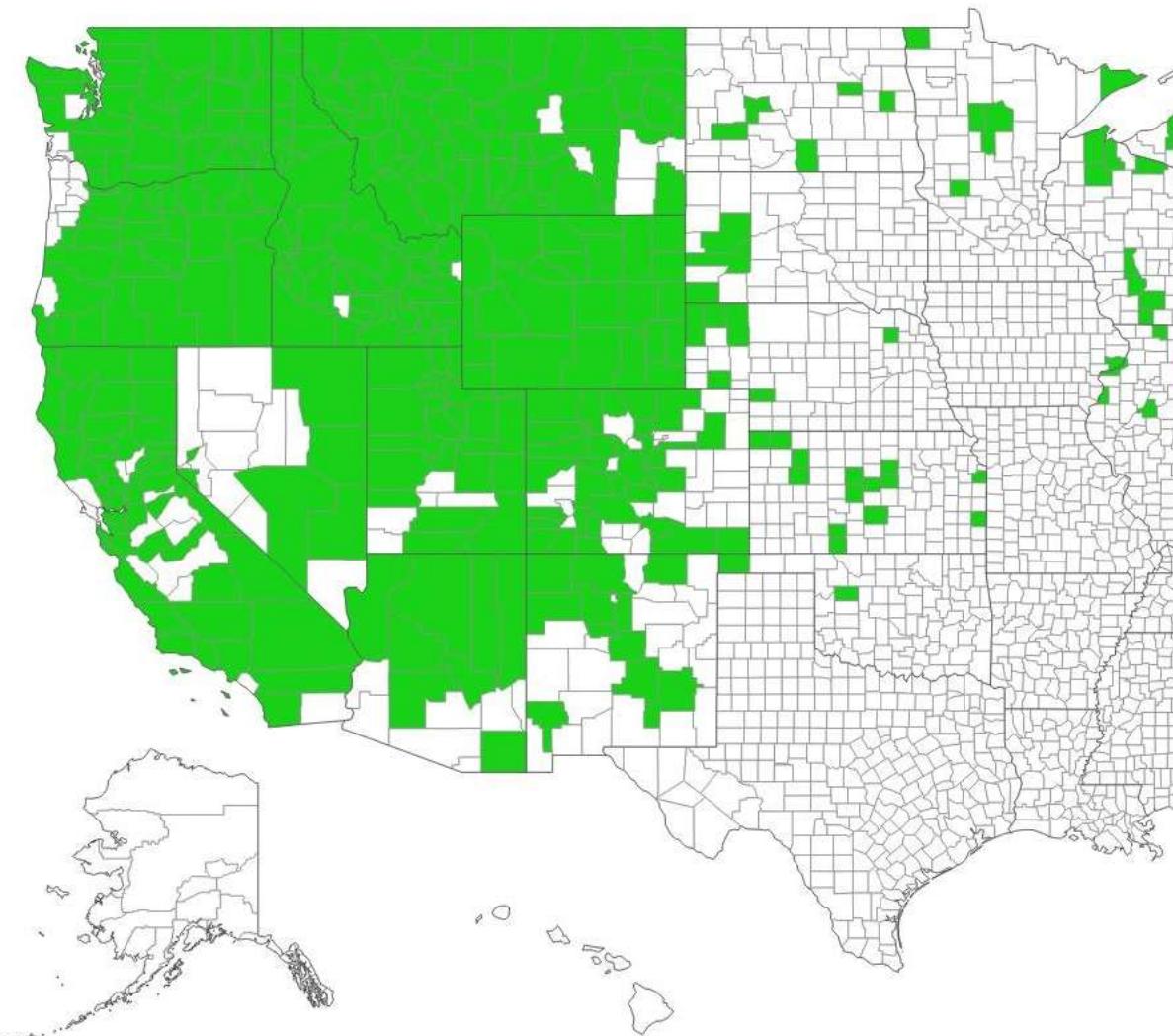
Dalmatian toadflax (*Linaria dalmatica* subsp. *dalmatica*), Plantaginaceae (= Scrophulariaceae)



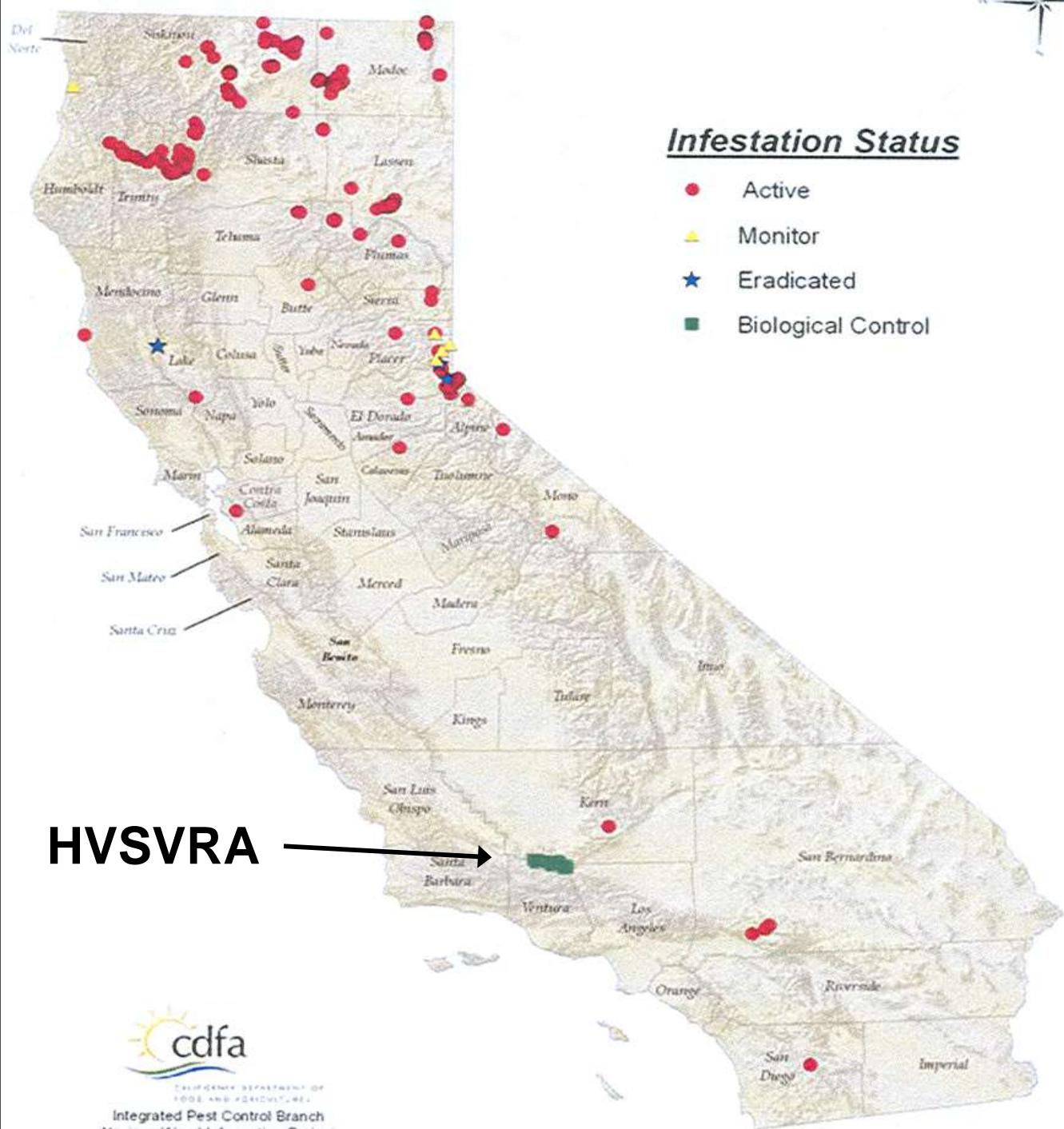
Hungry Valley State Vehicular Recreation Area

- Perennial forb; < 500,000 tiny seeds per plant
- Introduced by the 1800s from s.e. Europe
- Widespread invasive perennial weed in rangelands
- Toxic to livestock, displaces native vegetation
- Densities can reach 50 to 100 stems per square meter.
- Chemical control is effective with repeated treatments, but is not feasible for large invaded areas.

Dalmatian toadflax (*Linaria dalmatica*)



www.eddmaps.org



Biological Control of Dalmatian Toadflax

- 3 insects accidentally introduced (attack seed heads)
- BC program started in 1950s
- 5 species of insects have been approved & introduced to USA
- Only 1 species has been approved for release in CA
 - concern for risk to native snapdragons
 - stem weevil (*Mecinus janthiniformis*)



stem weevil (*Mecinus janthiniformis*)

Life Cycle

- One generation per year
- Adults emerge in the spring
- Adults feed on leaf tissue & mate
- Eggs are laid in young stems
- Larvae feed inside stems
 develop in about 2 months
- Pupae overwinter inside stems

stem weevil
Mecinus janthinus

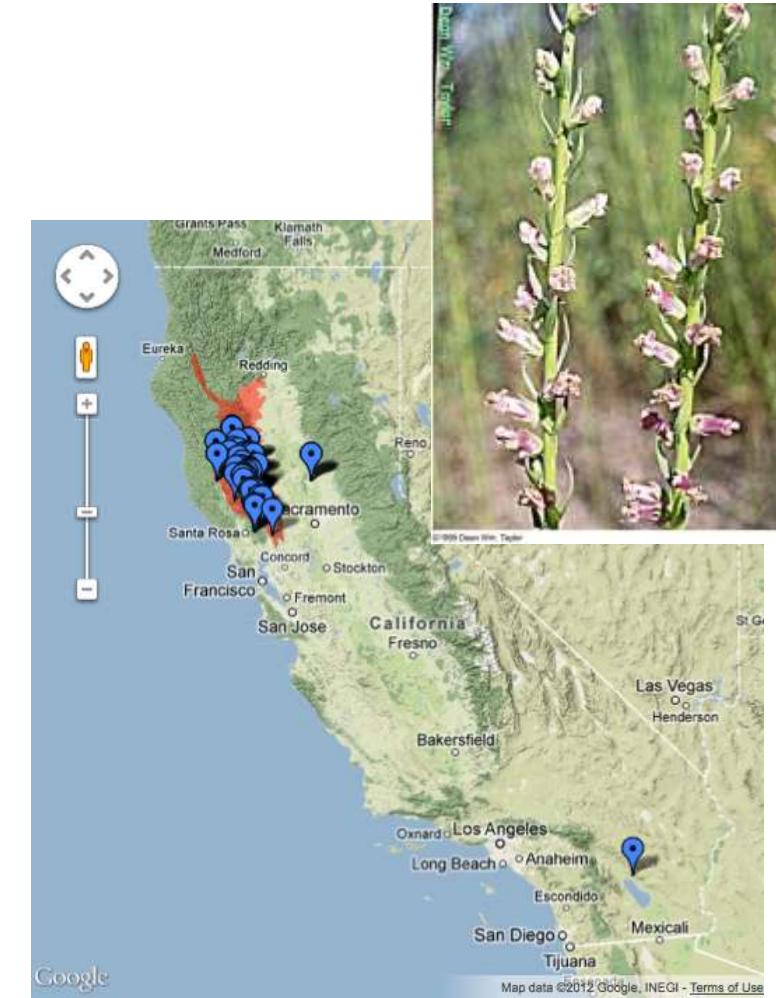
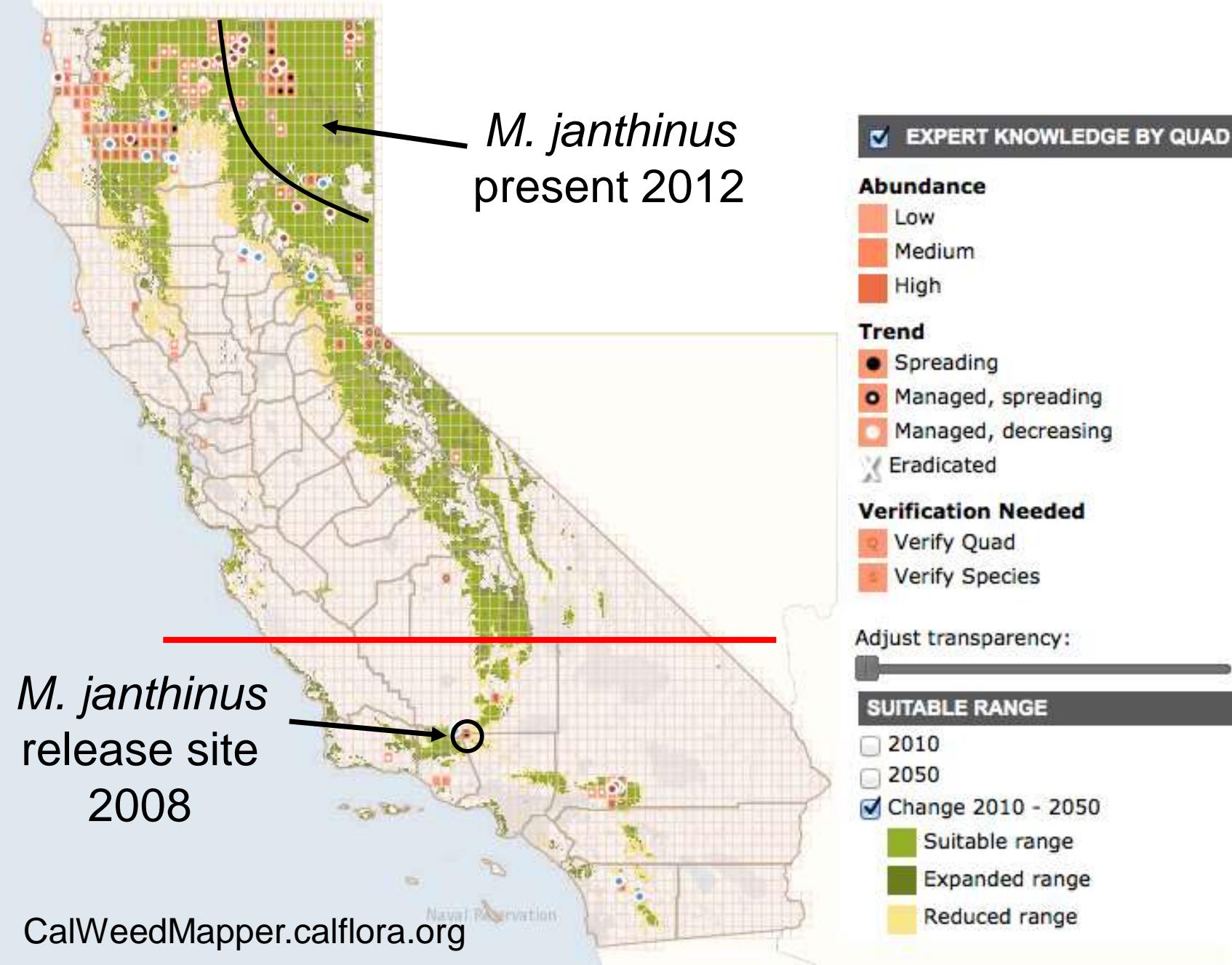


N. Poritz



N. Poritz

Dalmatian toadflax distribution in California



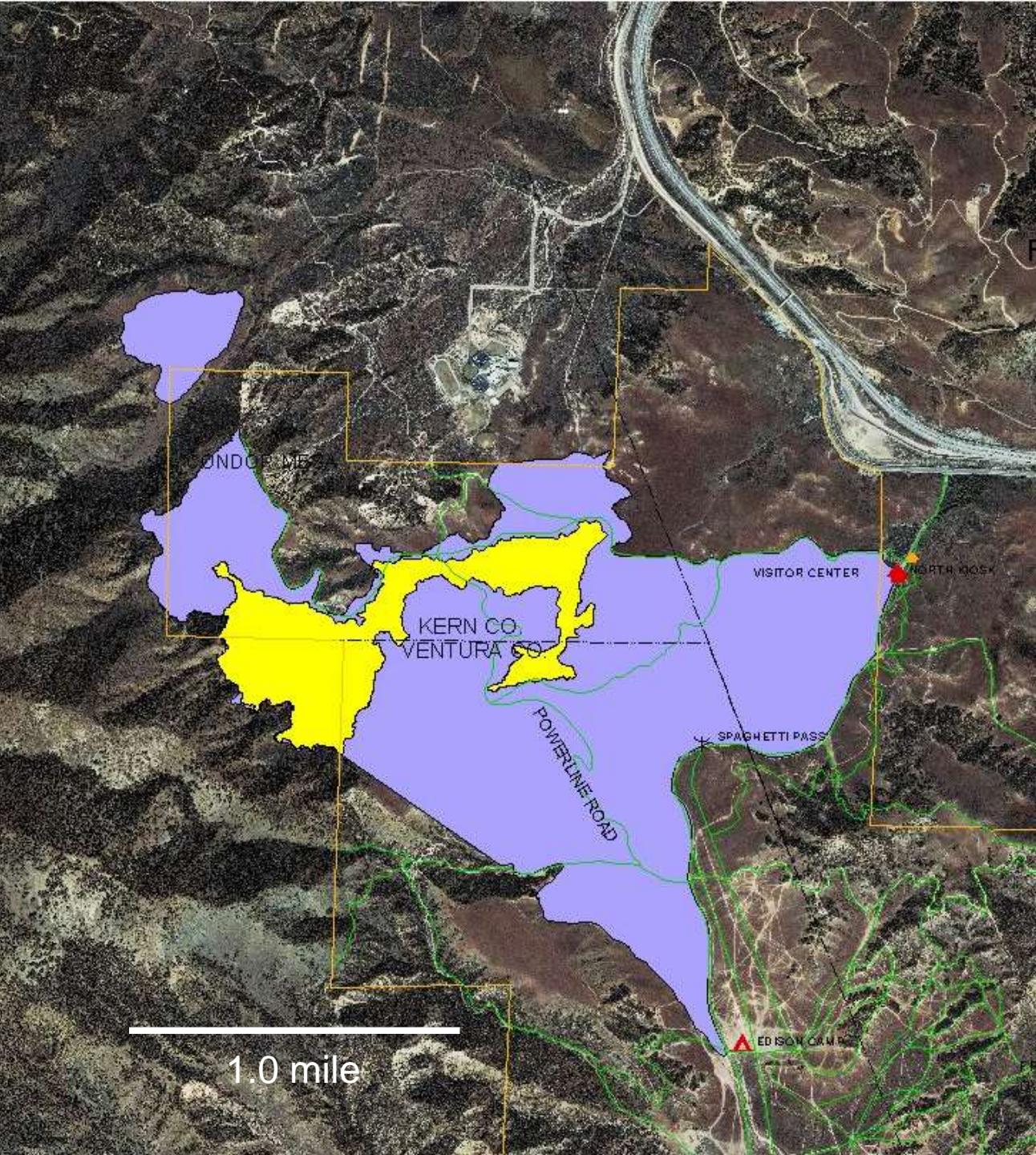
map from: ucjeps.berkeley.edu

photo from: calphotos.berkeley.edu

Dalmatian toadflax infestation near Gorman, CA in 2005

yellow = High density (159 acres)

blue = boundary of infestation (1033 acres)

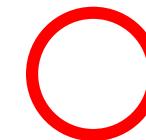
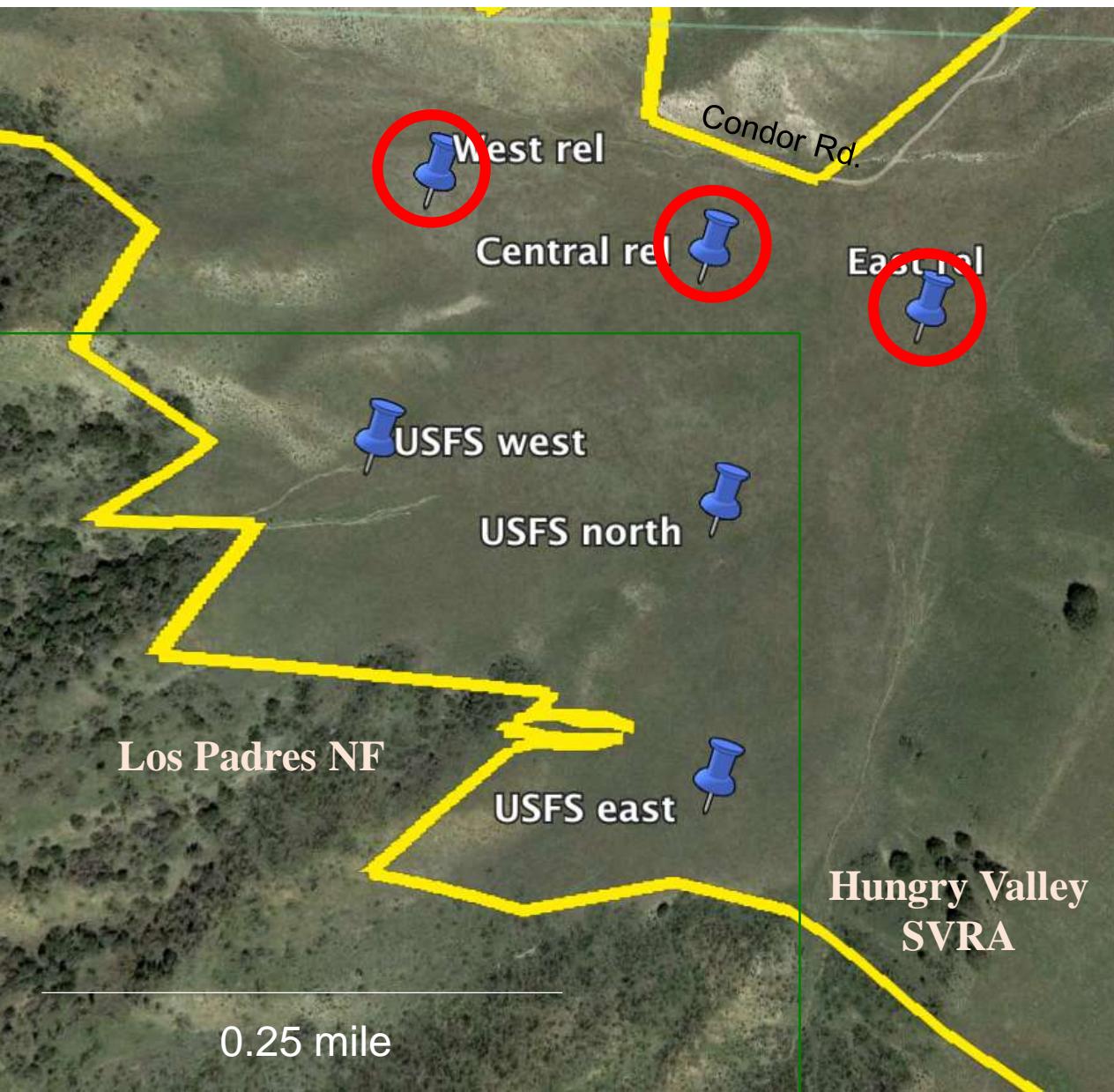


mapped by
Lloyd Simpson, USFS and
Kim Mathews, HVSRA
7/19/05

Site 1 (12/3/12) M. Pitcairn & D. Woods (CDFA)



Hungry Valley State Vehicle Recreation Area



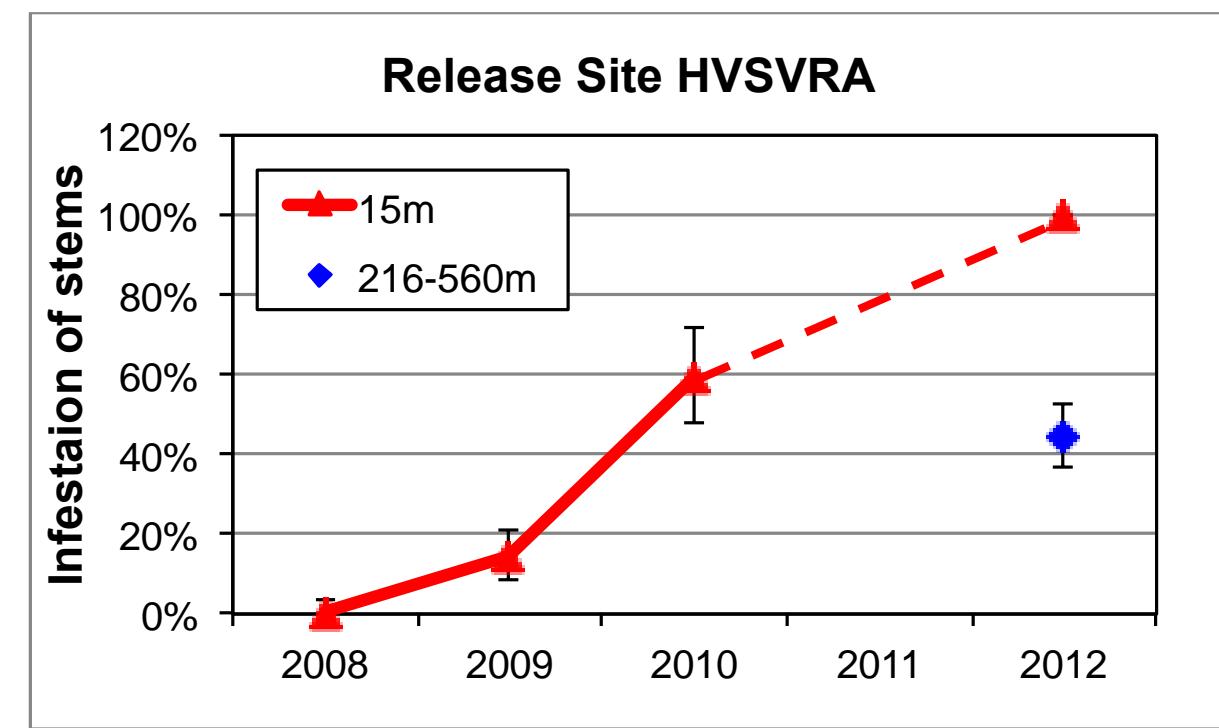
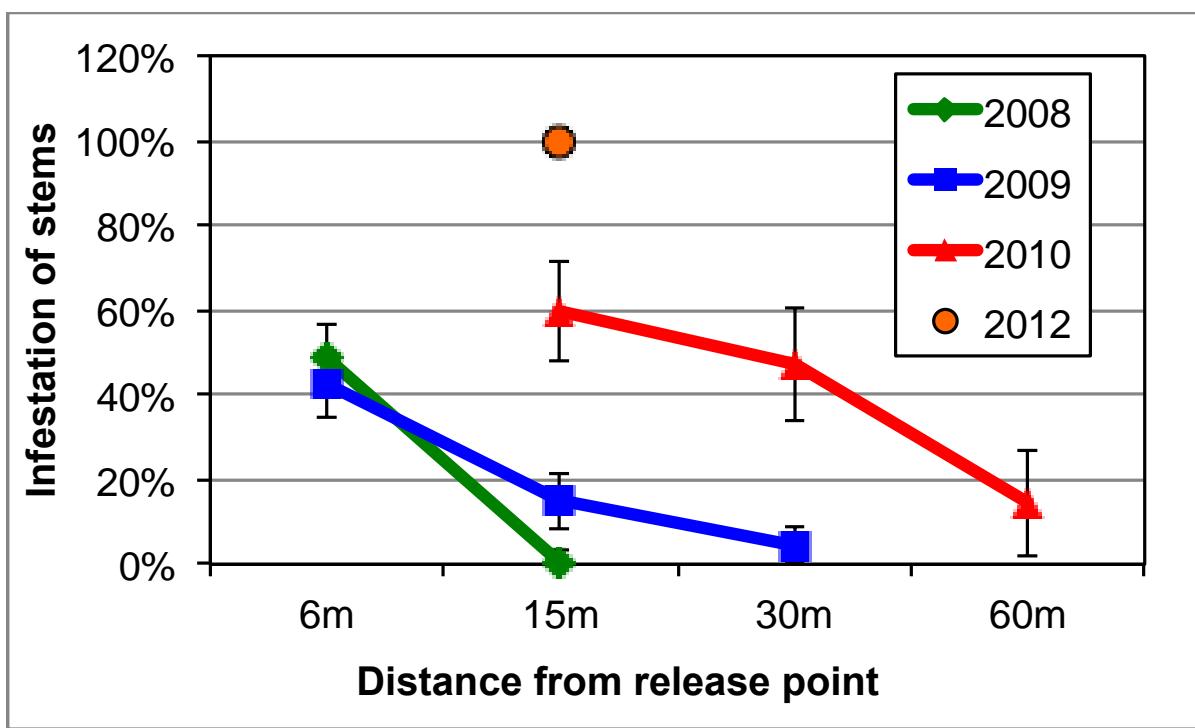
2008 Release sites



Check sites

Hungry Valley State Vehicle Recreational Area

2008 release



Grand Fire

May 15-20, 2013



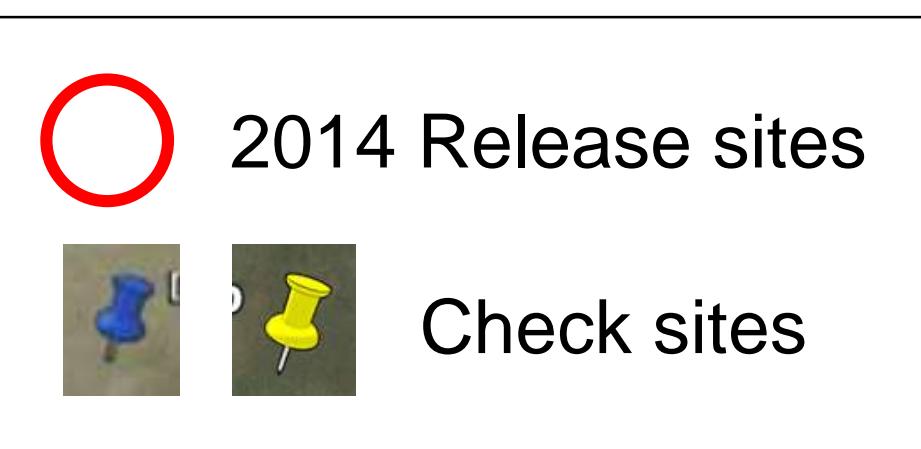
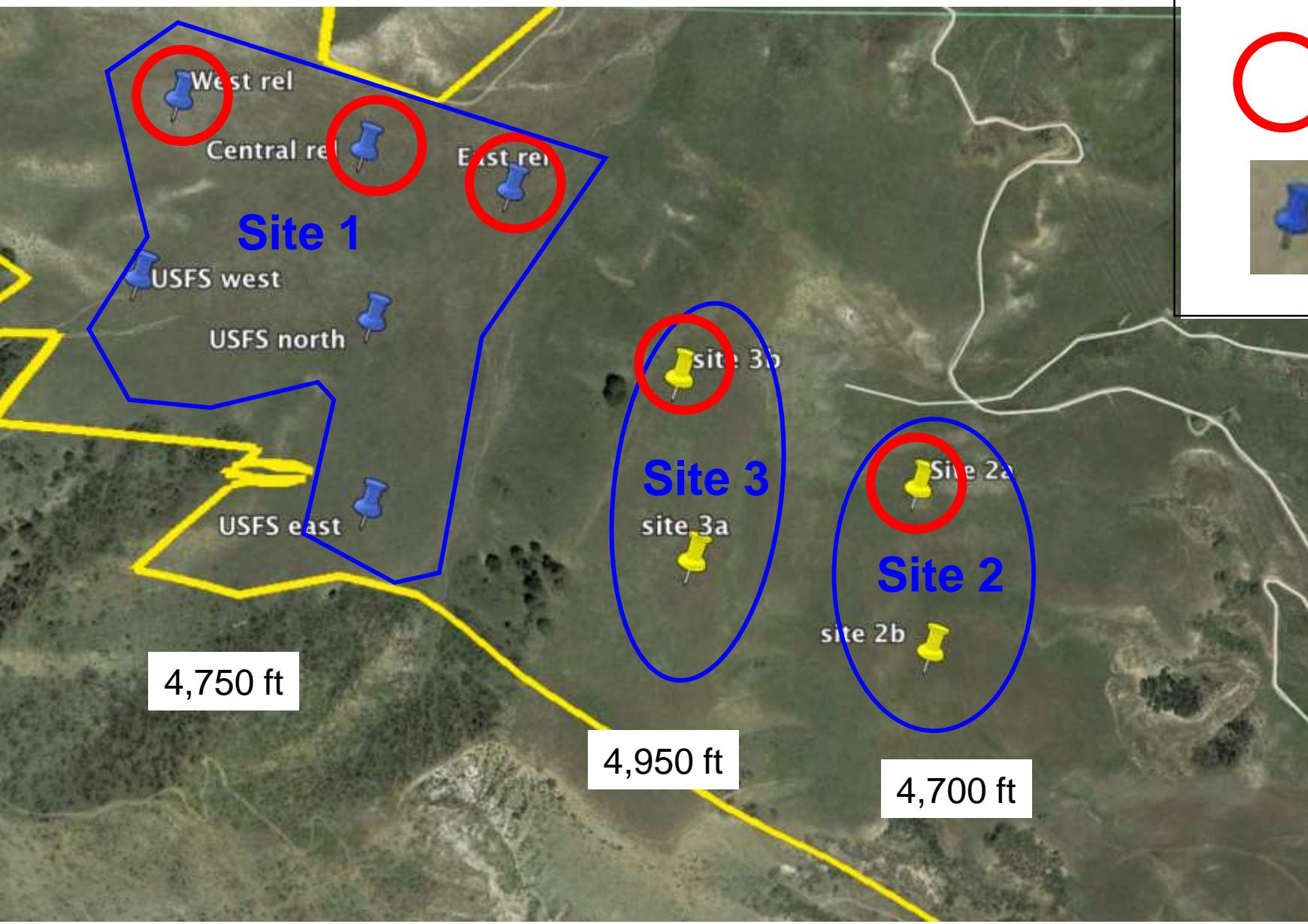
Grand Fire, May 15-20, 2013, HHSVRA site 1



2014 Release 1318 weevils at 5 sites (=263/site)



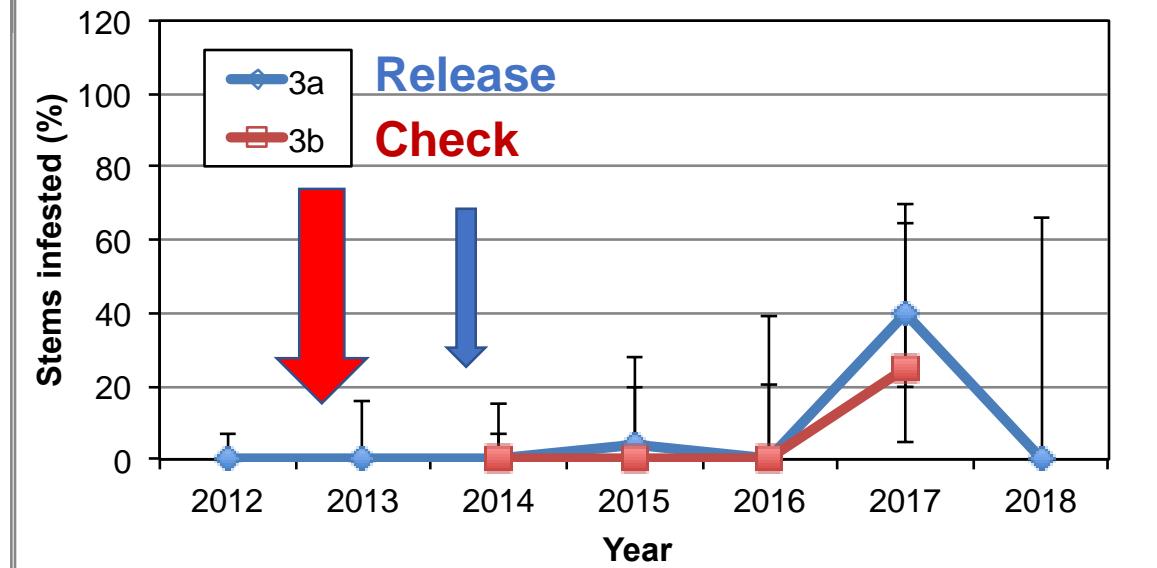
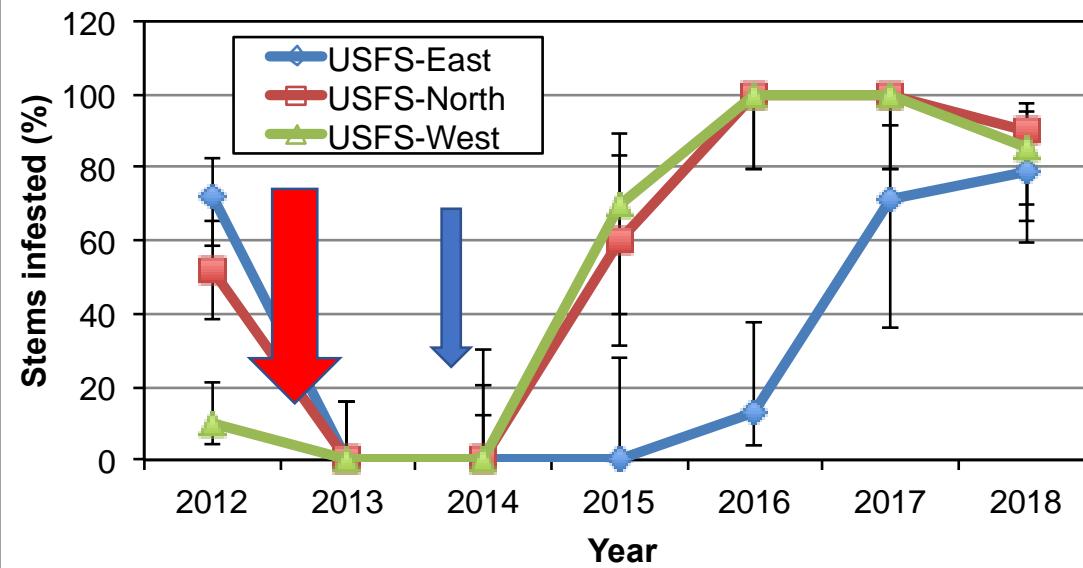
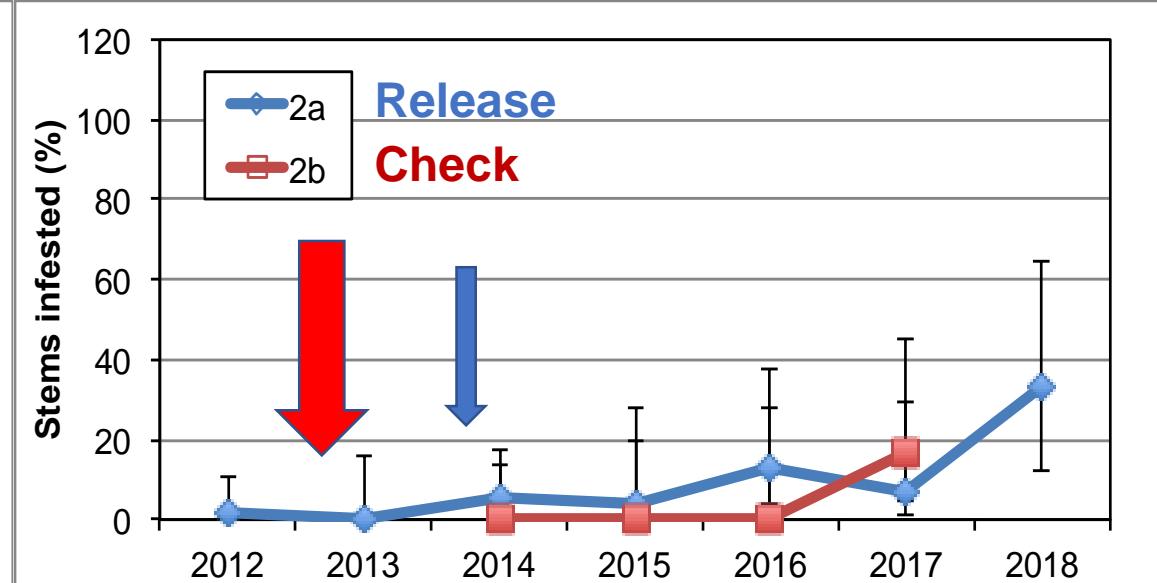
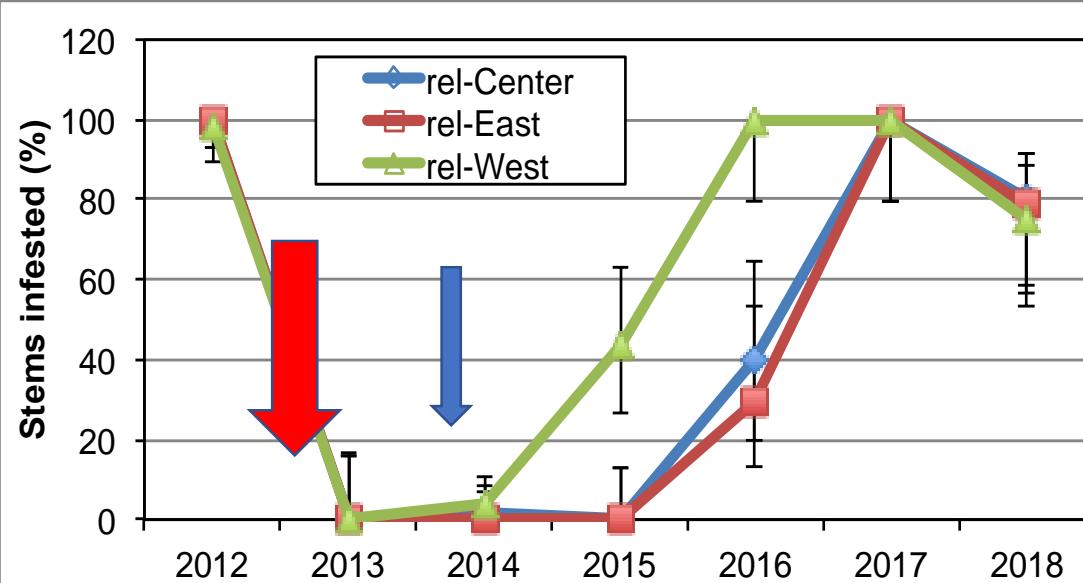
Hungry Valley State Vehicle Recreation Area



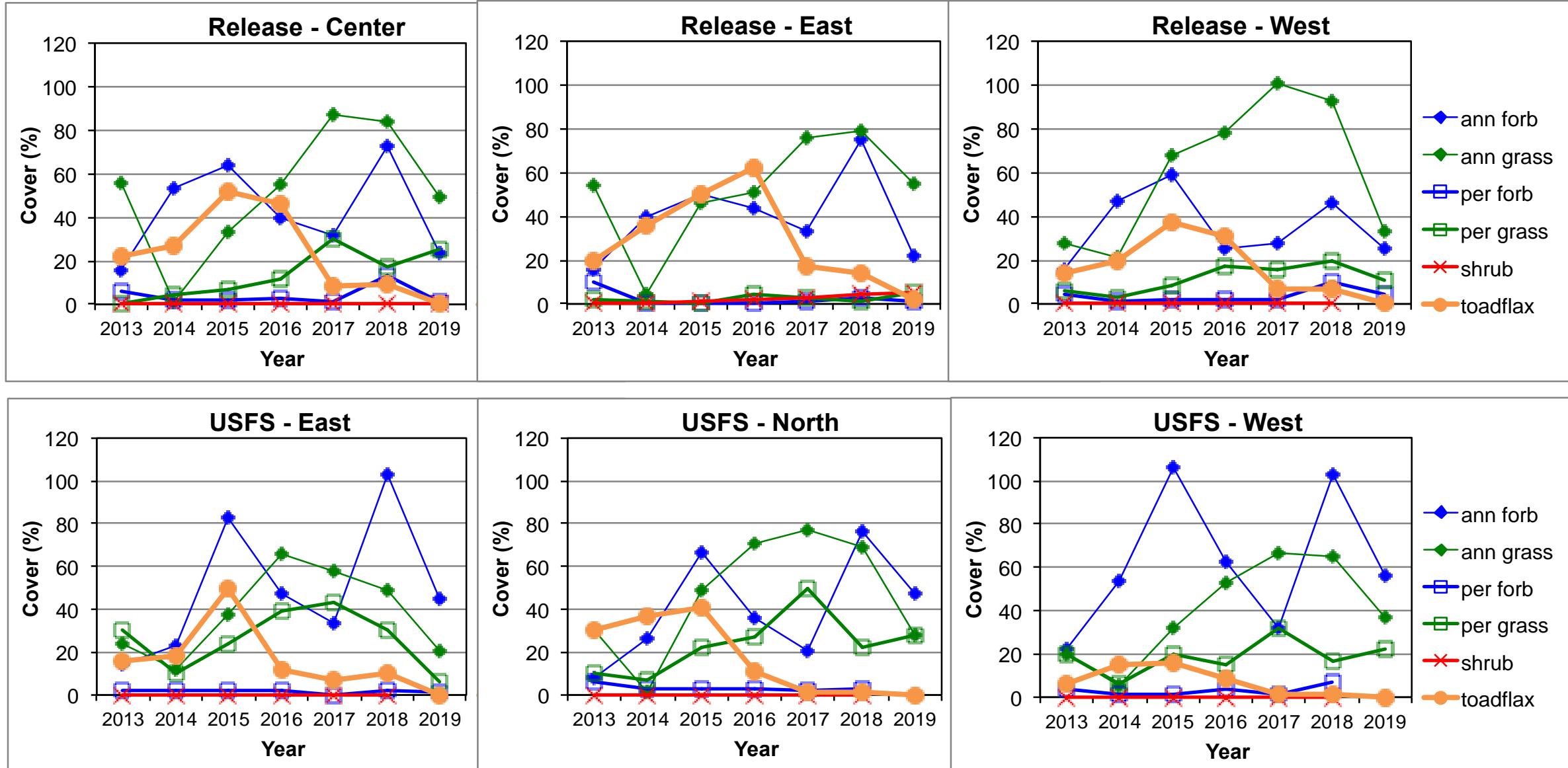
Infestation of Toadflax Stems at HVSVRA

2013 Fire

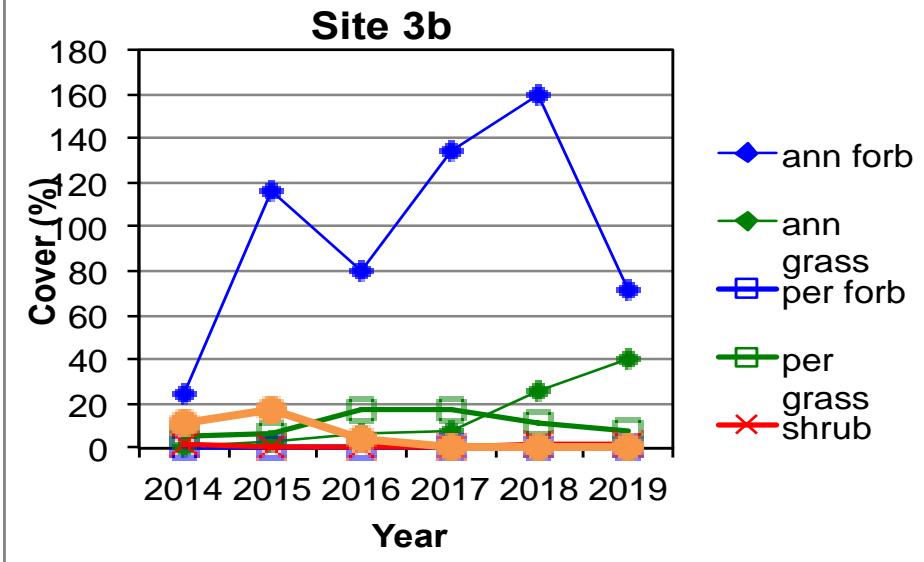
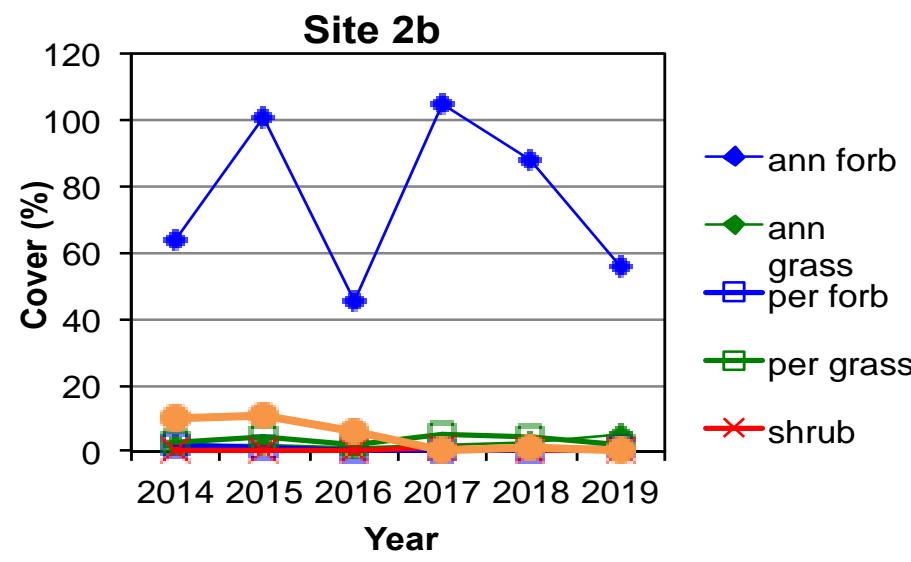
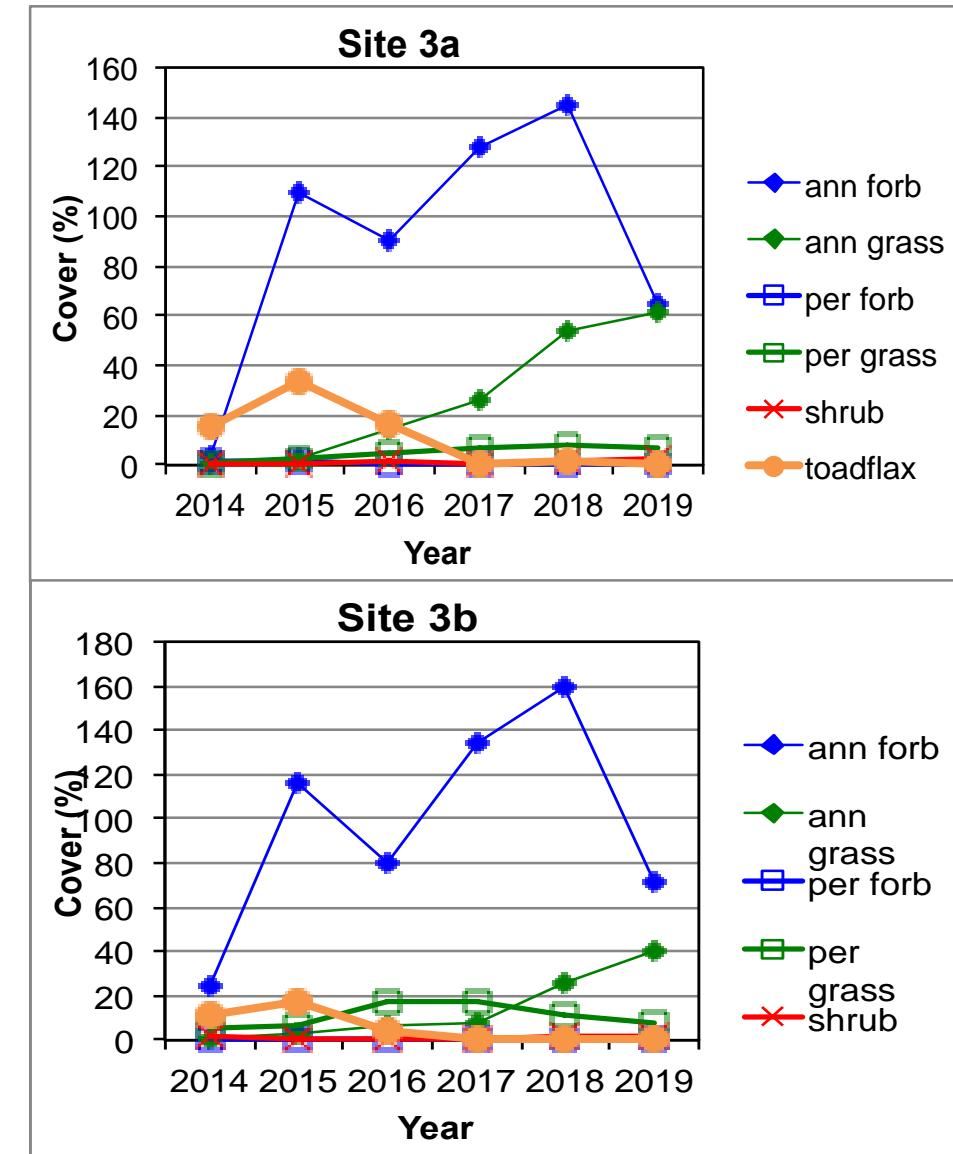
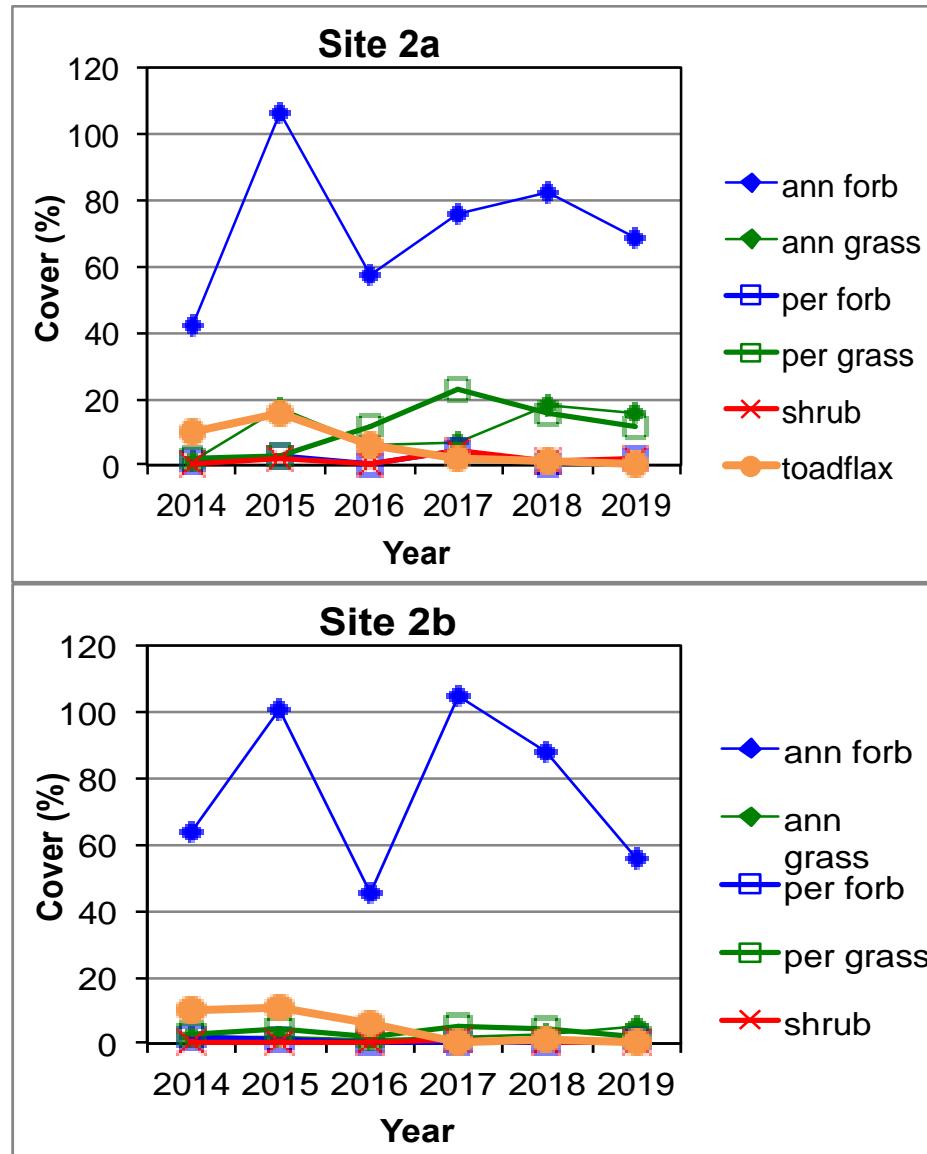
2014 Release



Vegetation Cover – Site 1 (2013-2019)



Vegetation Cover – Sites 2 & 3 (2014-2019)

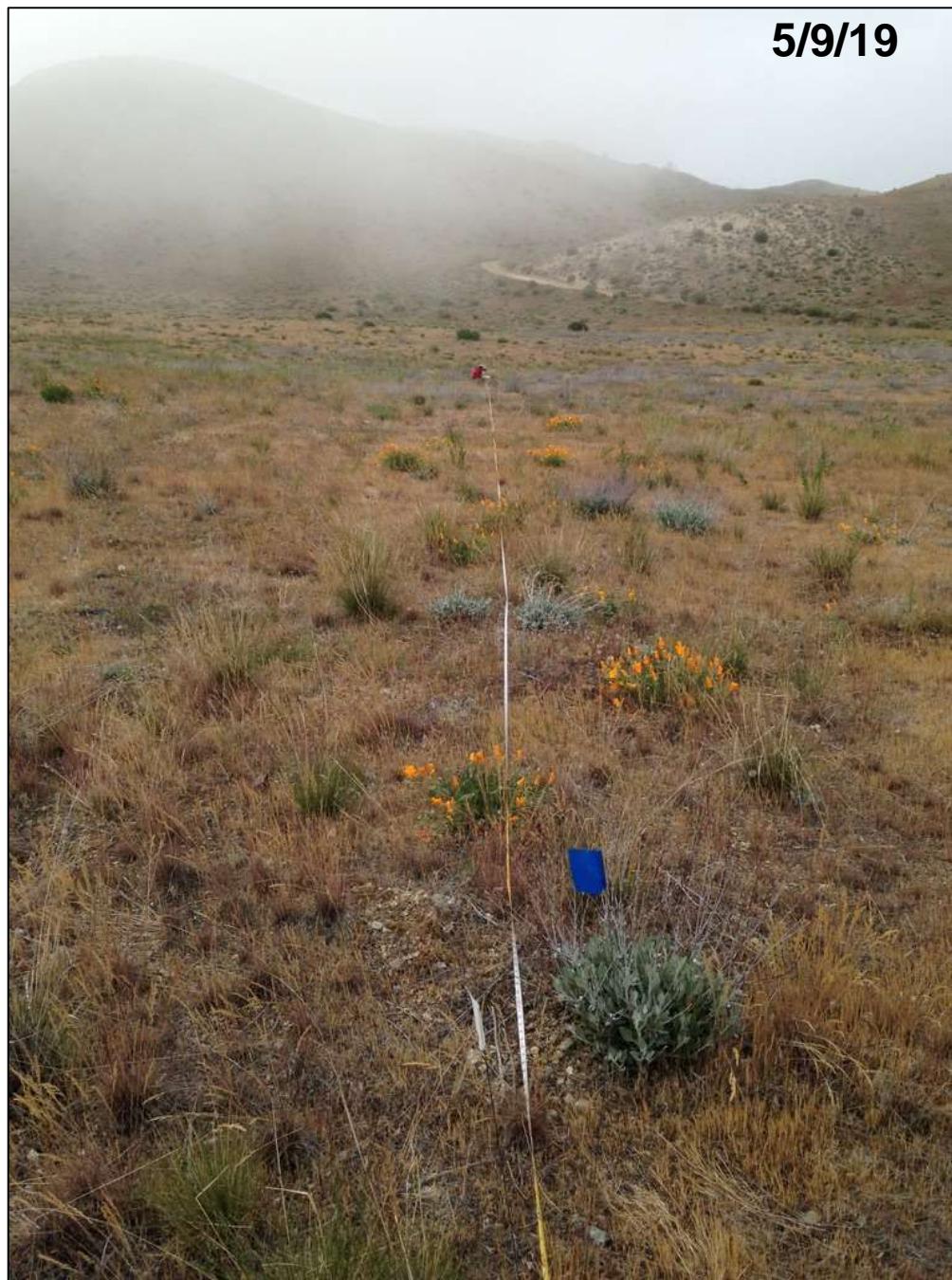


Site 1, Center Release

4/22/13



5/9/19



4/22/2013

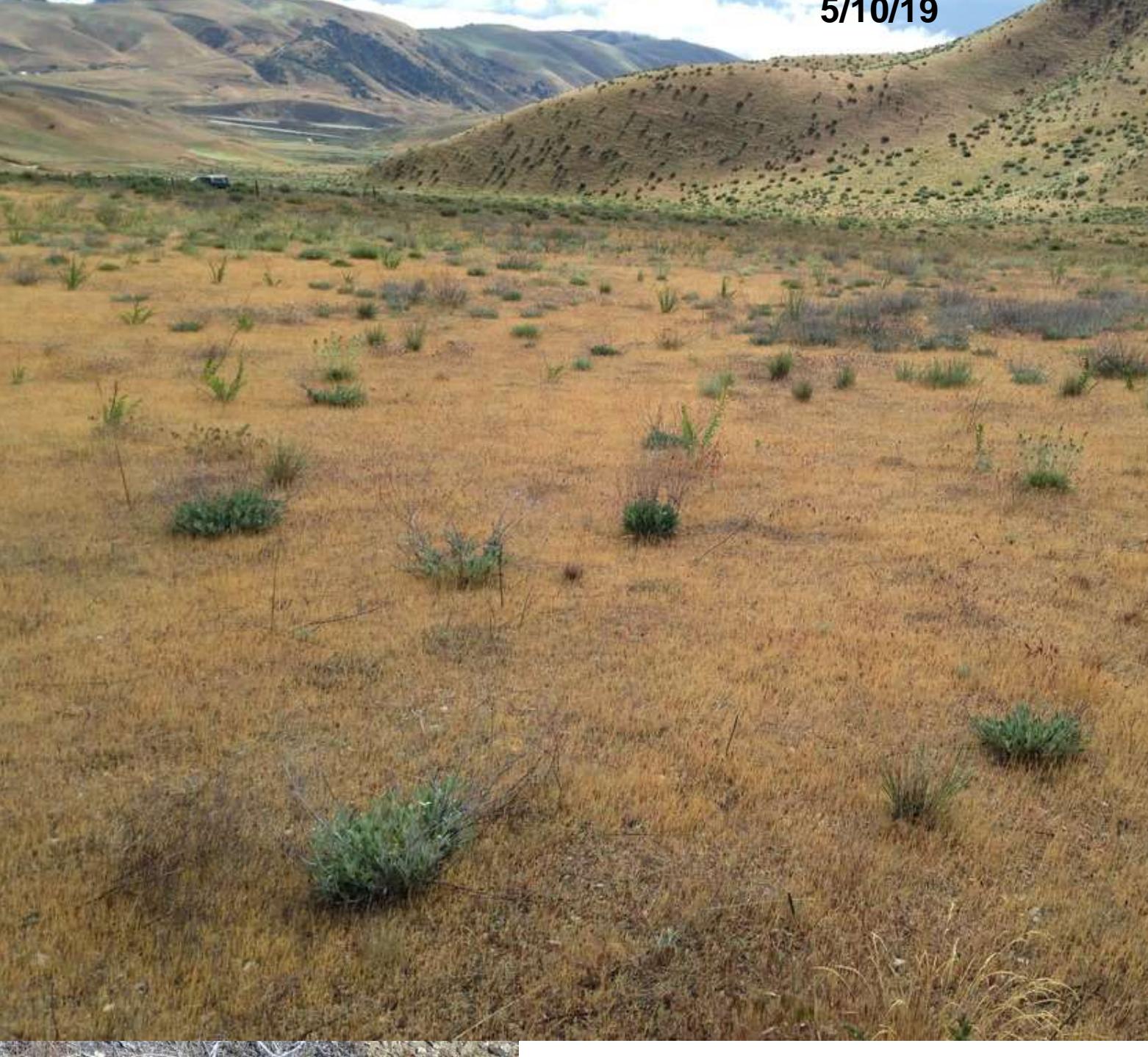
Site 1, USFS West

5/9/2019



5/10/19

Site 1, West Release





Irene Wibawa