The Relocation of *Plateilema palmeri* (A. Gray) Cockrell (Asteraceae), in Brewster County, Texas

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Background & Historical Documentation

Plateilema palmeri (A. Gray) Cockrell
Palmer's false Hymenoxys

- An infrequently documented and little studied species of Compositae
- Before relocation, known only from few locations in Coahuila and Nuevo León, Mexico and historical documentation in Brewster Co., TX

- Collected in Brewster Co. in 1929 by Henry T. Fletcher
- Has remained undocumented in the USA since Fletcher's find

The above from: Turner (2000) , Powell and Spellenberg (2013)

Species Description

- *Plateilema* a monotypic genus
- acaulescent perennial*, growing from 3.5 – 15 cm
- leaves basal, forming a distinct rosette, pinnately lobed
- involucres broadly turbinate, often disarticulating at maturity
- phyllaries persistent, indurate at maturity
- ray flowers yellow to pale-yellow, augmented with maroon nerves abaxially
- disk flowers yellow

From: Strother (2006), Powell and Worthington (n.d.)

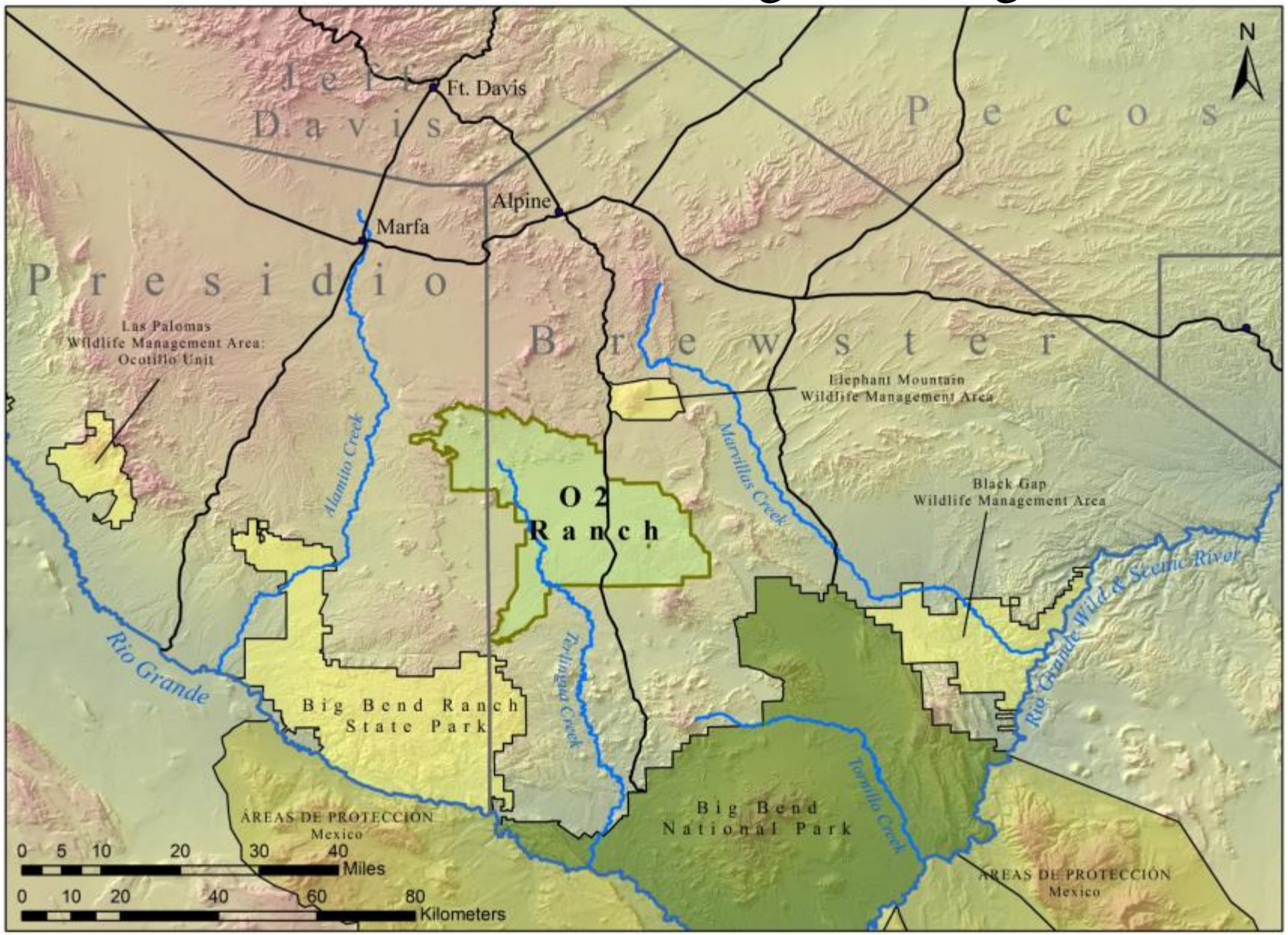
Relocation

- Made on 12 Aug 2014, while conducting vegetation surveys on the O2 Ranch
- Multiple treatment approach to restoring desert grasslands
    - Application of tebuthiuron (Spike) followed by prescribed fire
- Objective of these surveys to determine abundance of broad-leaved herbaceous plants (forbs) following Spike treatments and Spike – prescirbed fire treatments
- Modified-Whittaker Nested Plot sampling design
- Rectangular plot design improves ability to assess species richness (Stohlgren et al. 1998)
- Tasked with identifying all forbs within plots

13 June 2014

28 Aug 2014

Location of the O2 Ranch in the Big Bend Region of Texas

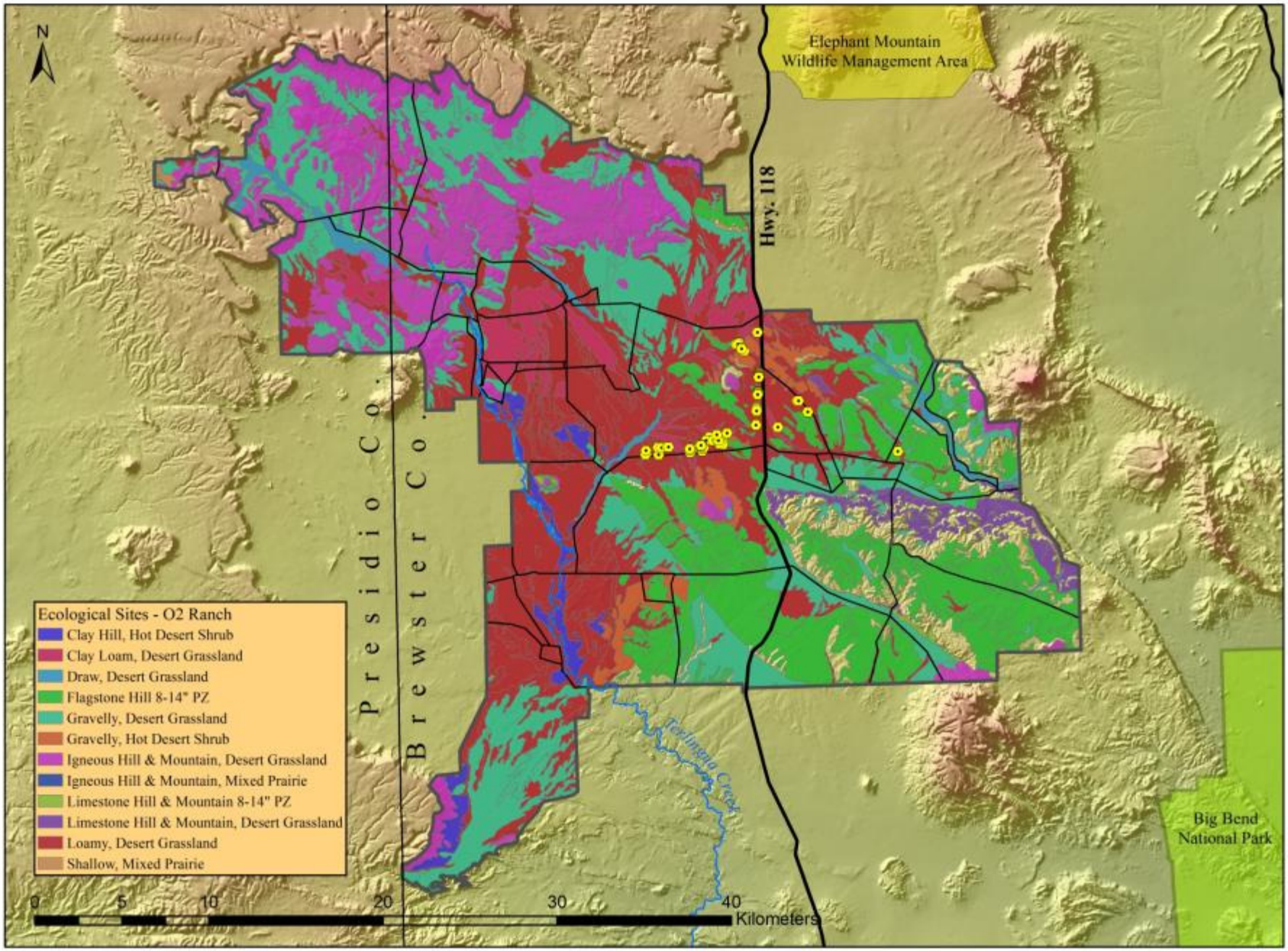


O2 Ranch

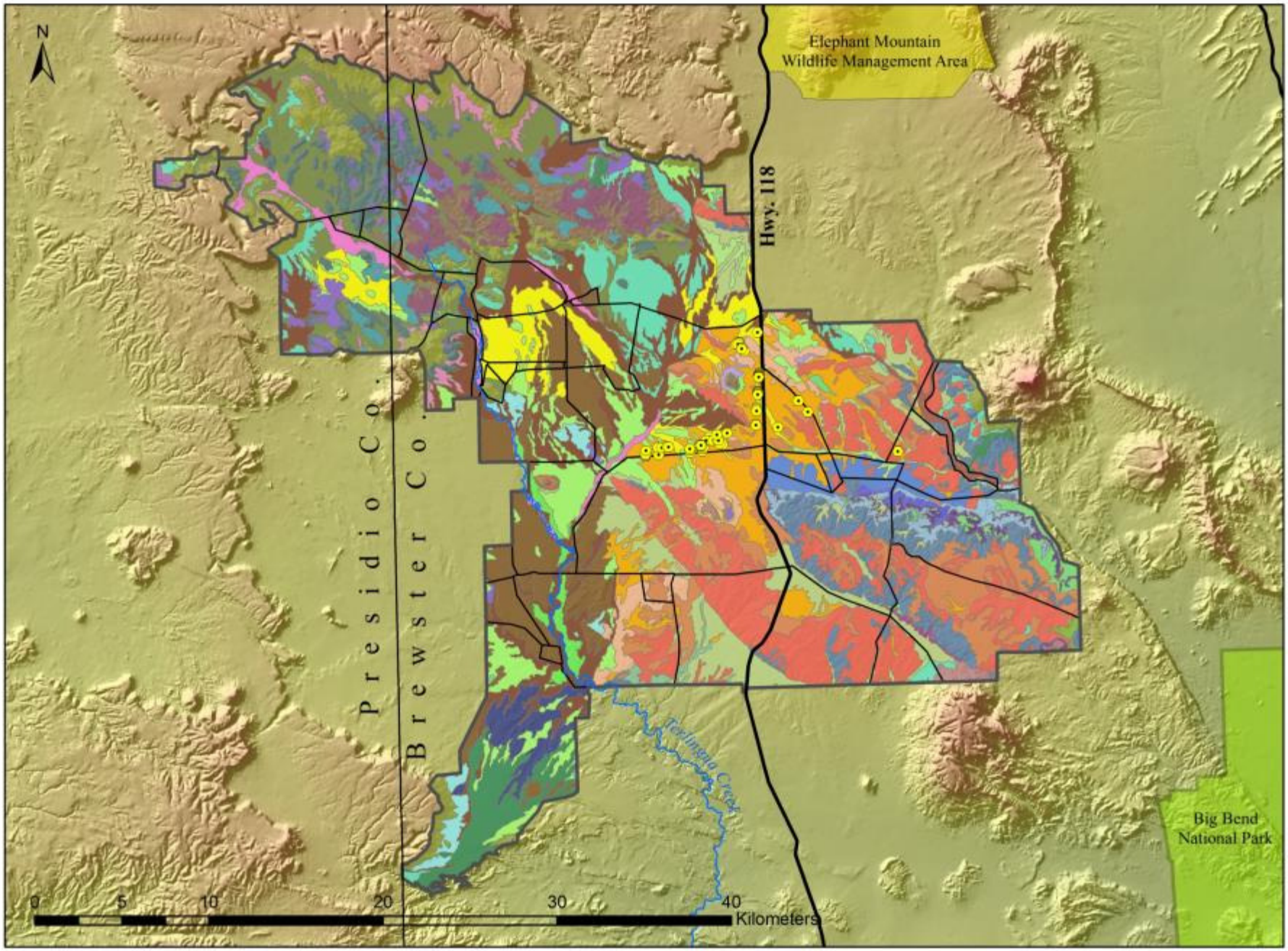
- History
  - 275,000 ac
  - Stocking first began in the Green Valley in 1885
  - O2 Ranch established in 1890
  - Lykes Brothers purchased the ranch in 1941
  - Leased for many years; restoration began in 2002
- Environment
  - A diverse landscape: geology, soils, flora
  - Shift in vegetation composition: on an elevation gradient – Montane Woodlands (Davis Mtns.); Plains Grassland – Desert Grassland (Marfa Plateau and south of Alpine); Desert Grassland – Chihuahuan Desert Scrub (O2)
  - Precipitation highly localized: ~ 10 in annually
  - Temperatures from 110° F (1928) - 5° F (1919) (Keller 2005)
  - Major portion of the ranch is an alluvial basin (Green Valley – tobosa flats)

O2 Restoration Treatments

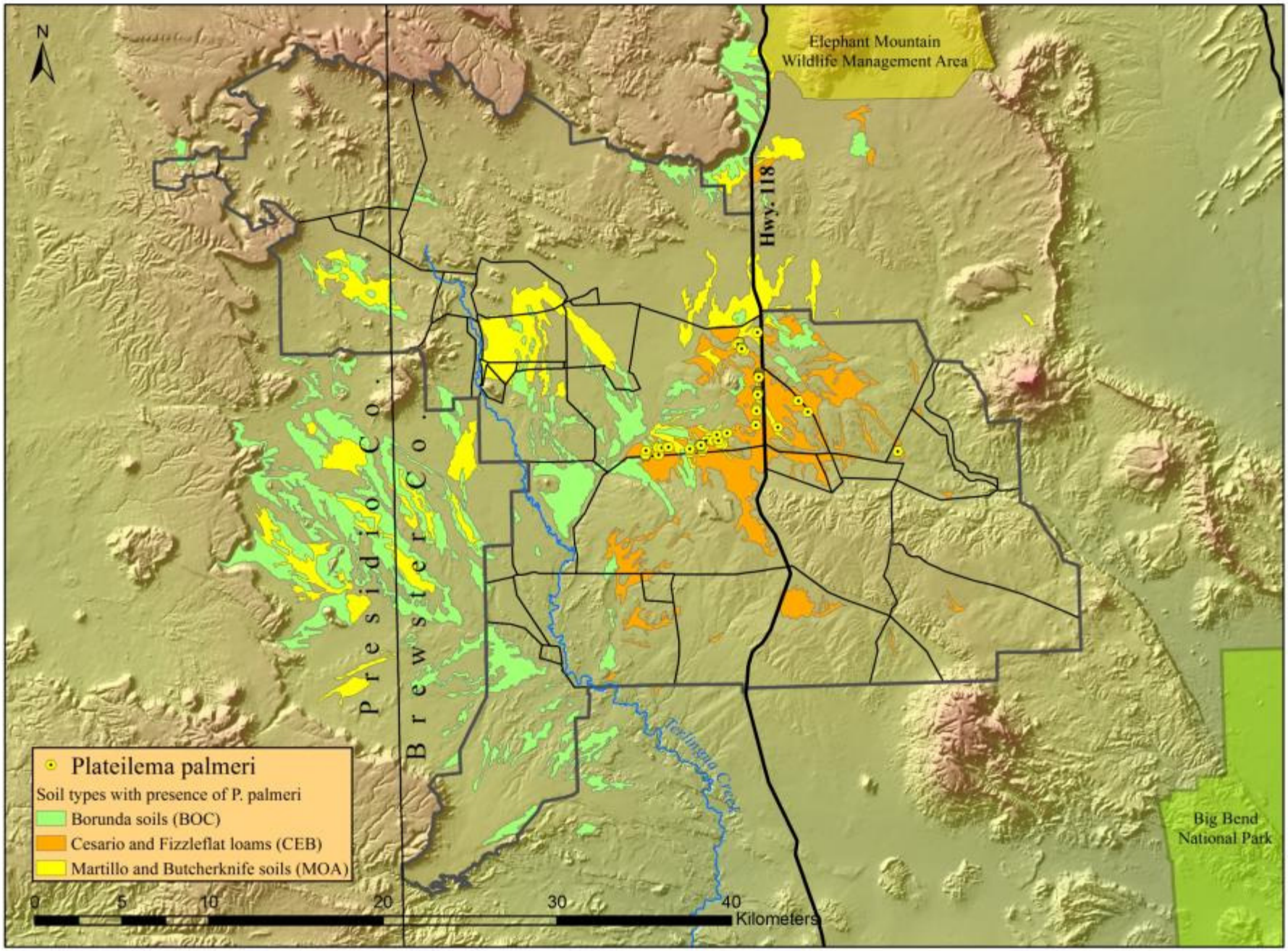
- Large scale restoration project began in 2002
  - Grant from F. E. Lykes Foundation
    - Additional matching funds from USDA, USFWS, TPWD
  - Project Director, Dr. Bonnie Warnock, Sul Ross State University
  - Ranch Manager, Homer Mills
- Several areas targeted: Duff Springs, Sid Pasture, Terlingua Creek
- Sid Pasture
  - Mechanical grubbing began in 2008
  - Spike treatments 2009 – 2010
  - Mechanical grubbing in 2010
  - Prescribed fire: 2010 – present
    - treatment areas given 7 – 10 yr interval
  - Specific soil types chosen
  - This work has allowed for many research opportunities and hands on experience for Sul Ross State University students



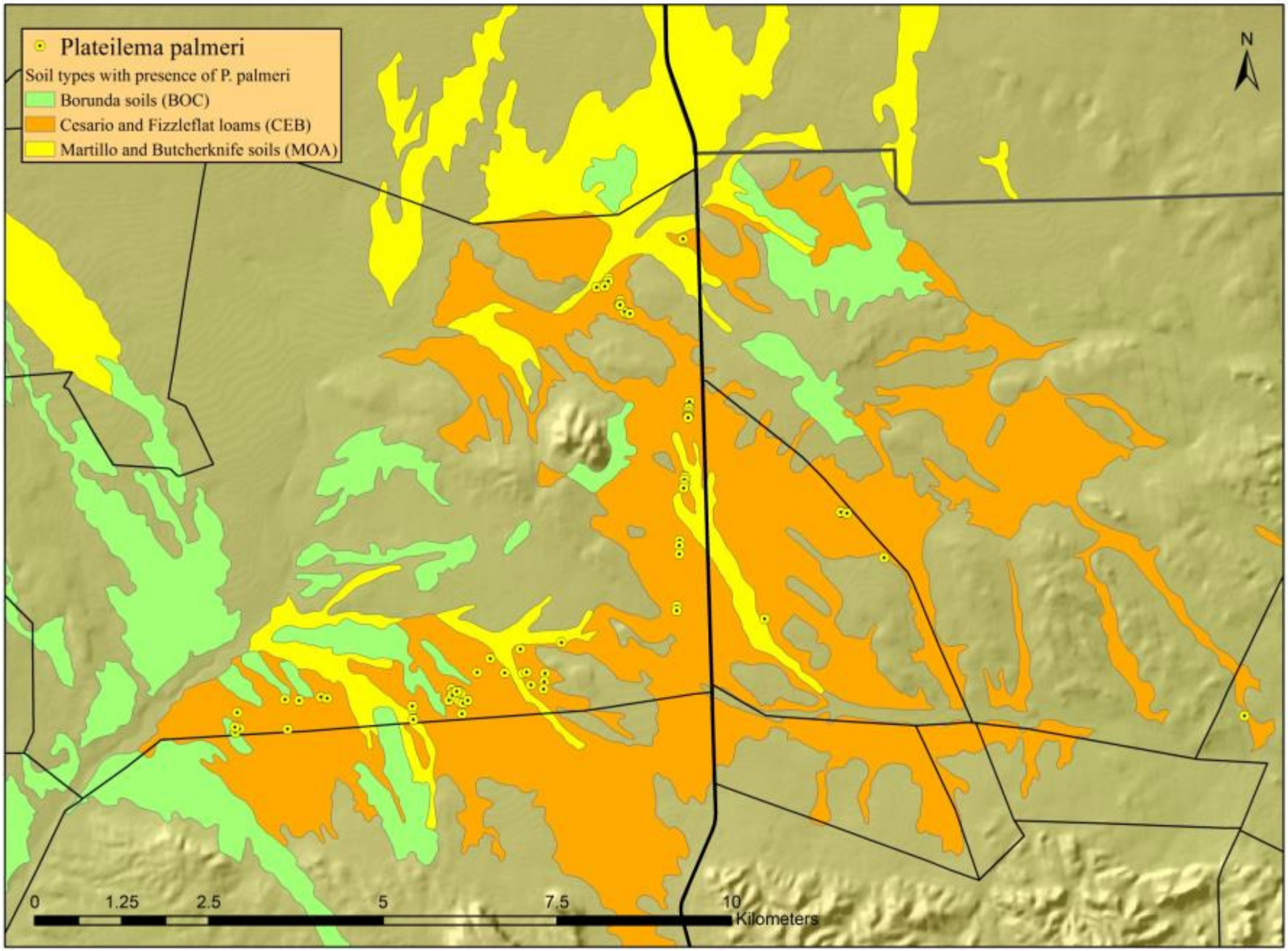
Ecological sites located on the O2 Ranch (12, to date)



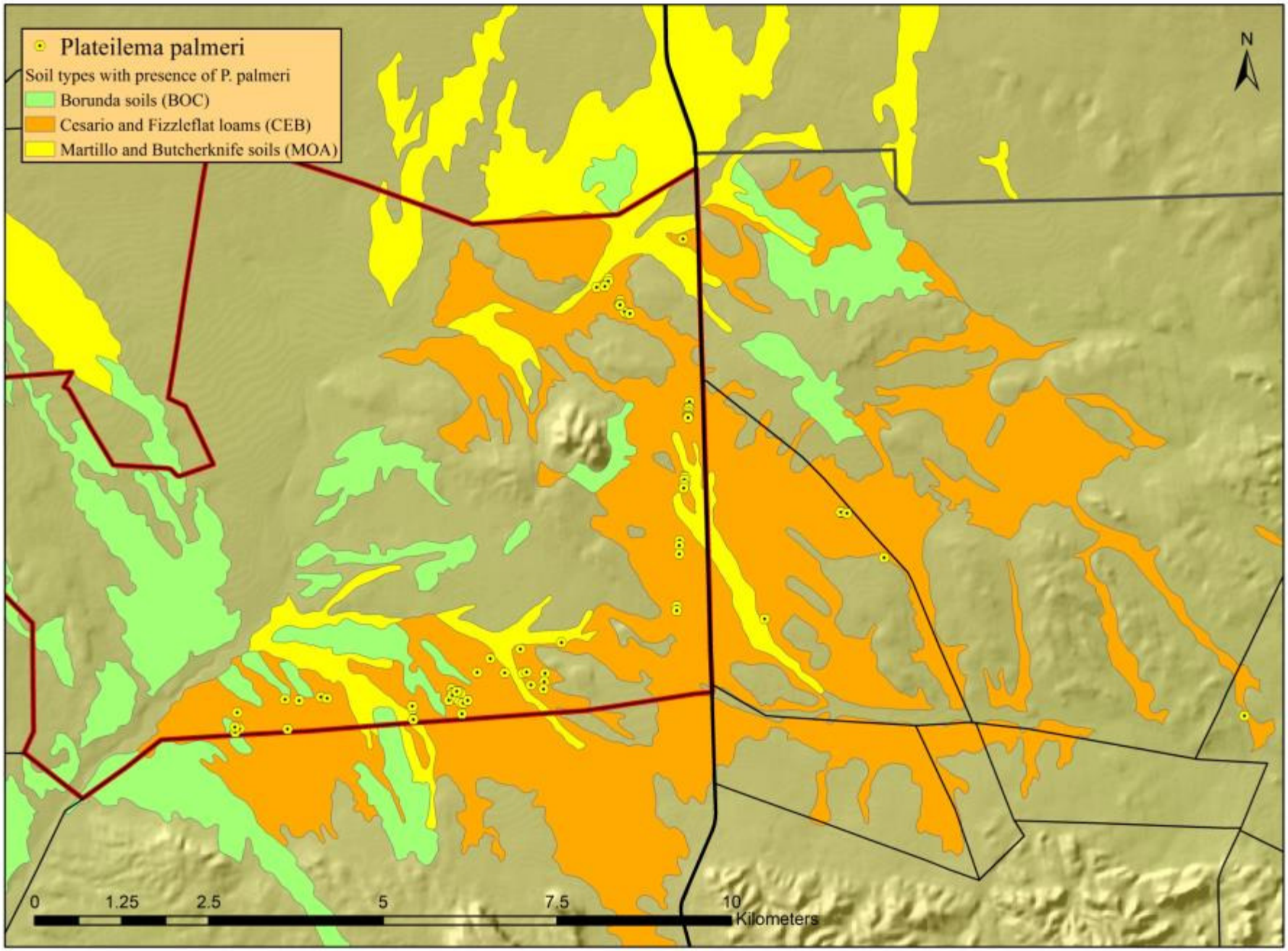
Soil types found on the O2 Ranch (43, to date)



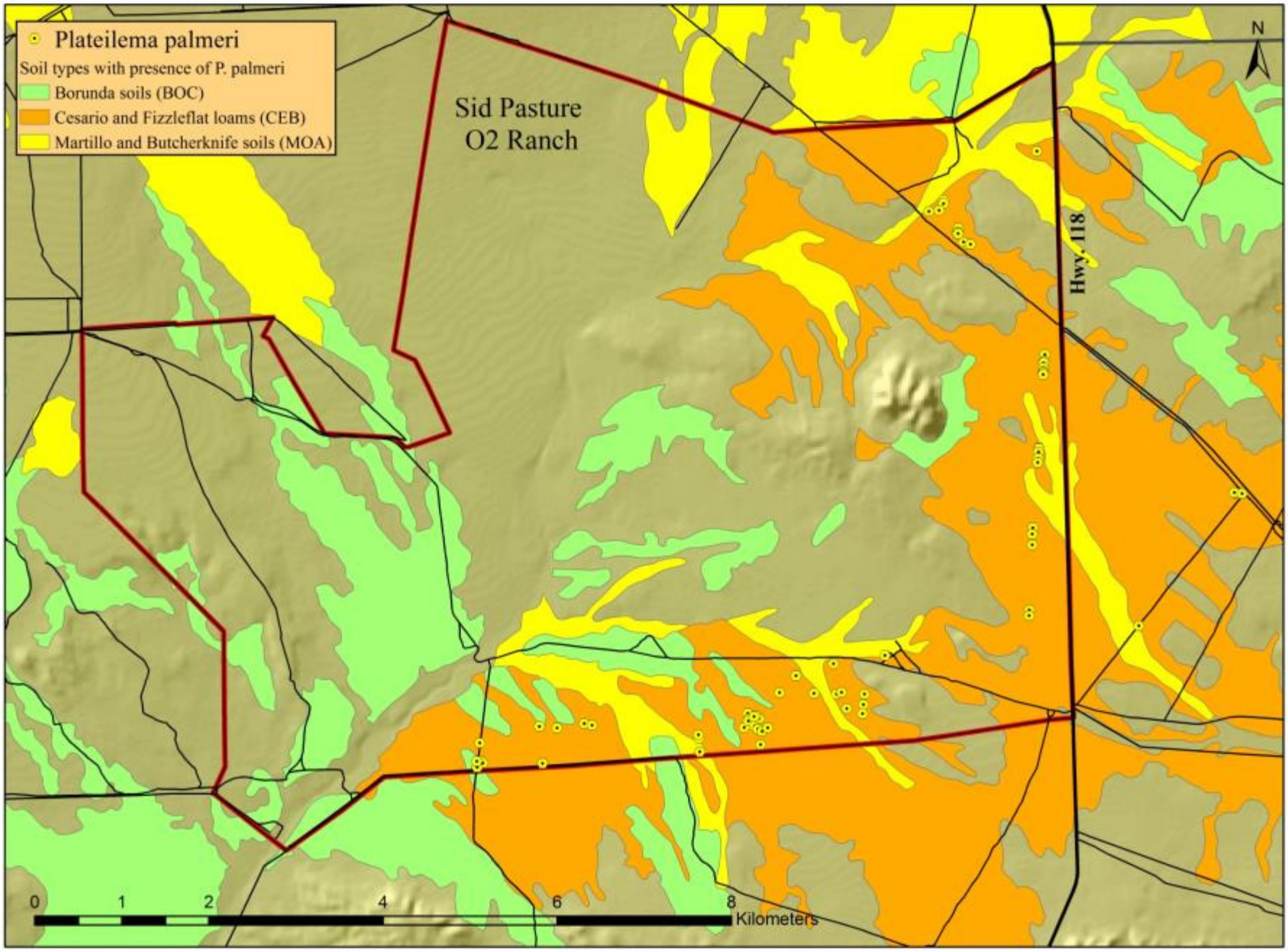
Soil types with presence of *P. palmeri*



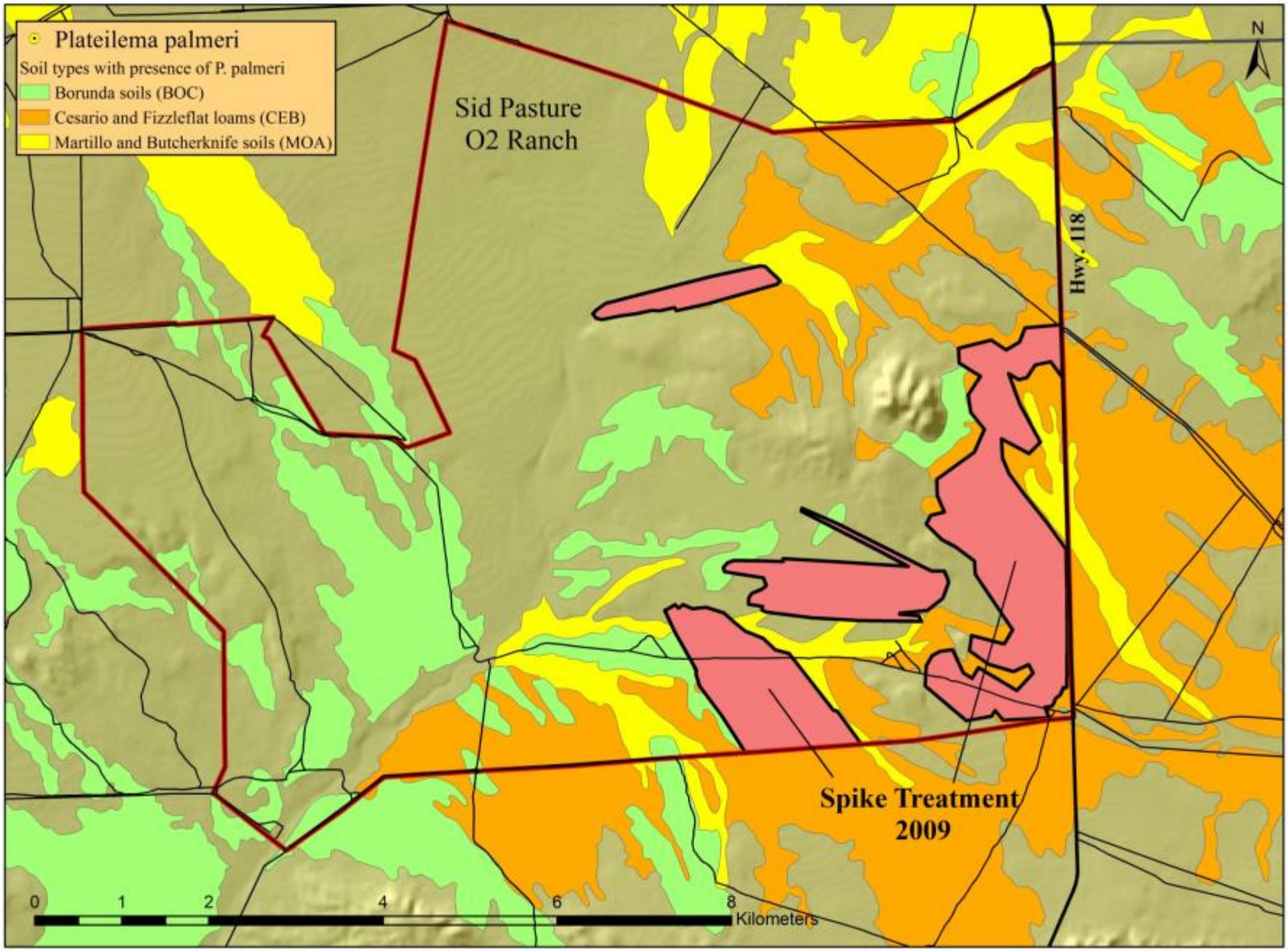
Current documented distribution of *P. palmeri* on the O2



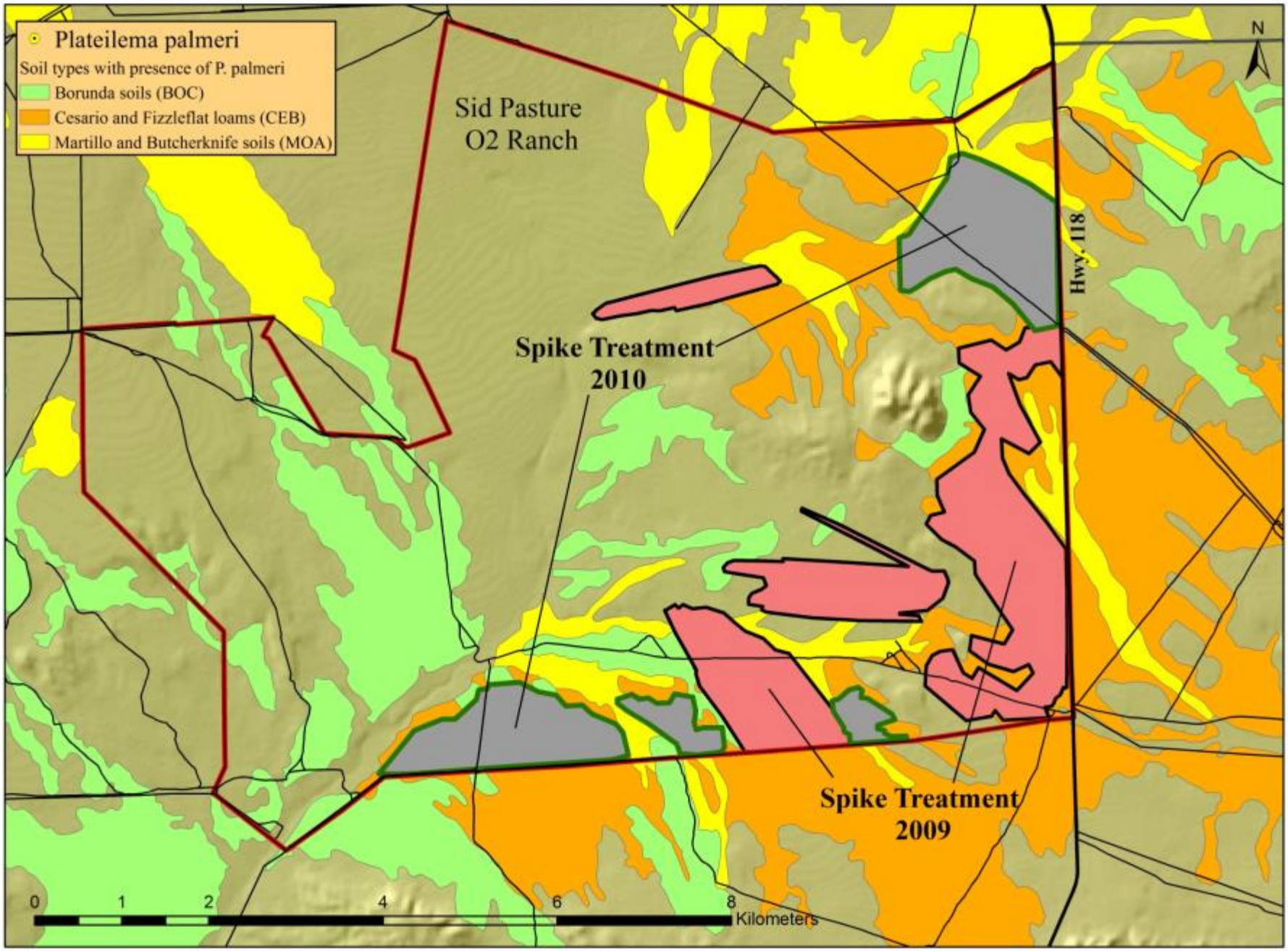
Current documented distribution of *P. palmeri*


Plateilema palmeri
Soil types with presence of P. palmeri
Borunda soils (BOC)
Cesario and Fizzleflat loams (CEB)
Martillo and Butcherknife soils (MOA)
Sid Pasture
O2 Ranch
Hwy 118
N
0
1
2
4
6
8
Kilometers

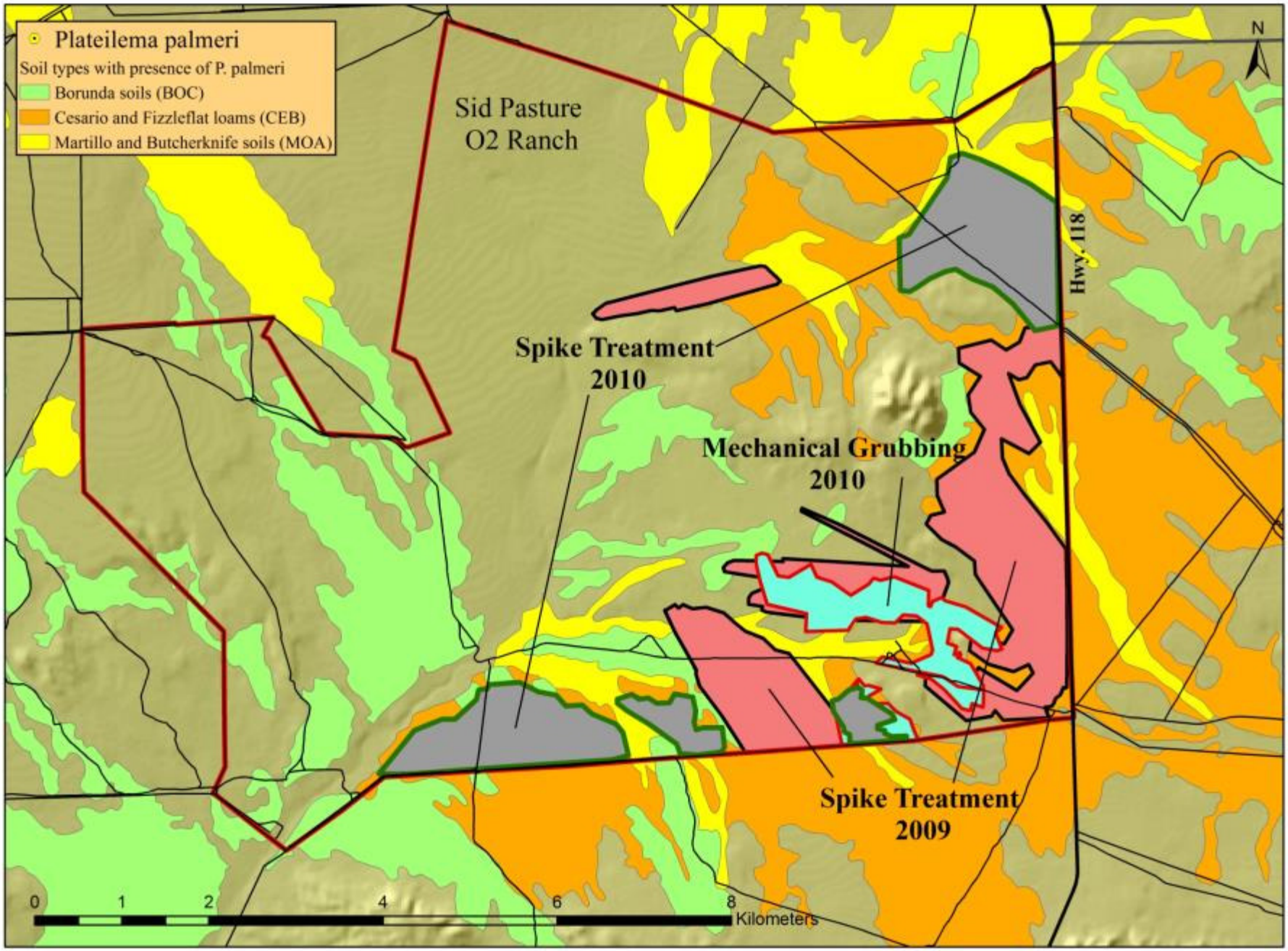
Sid Pasture



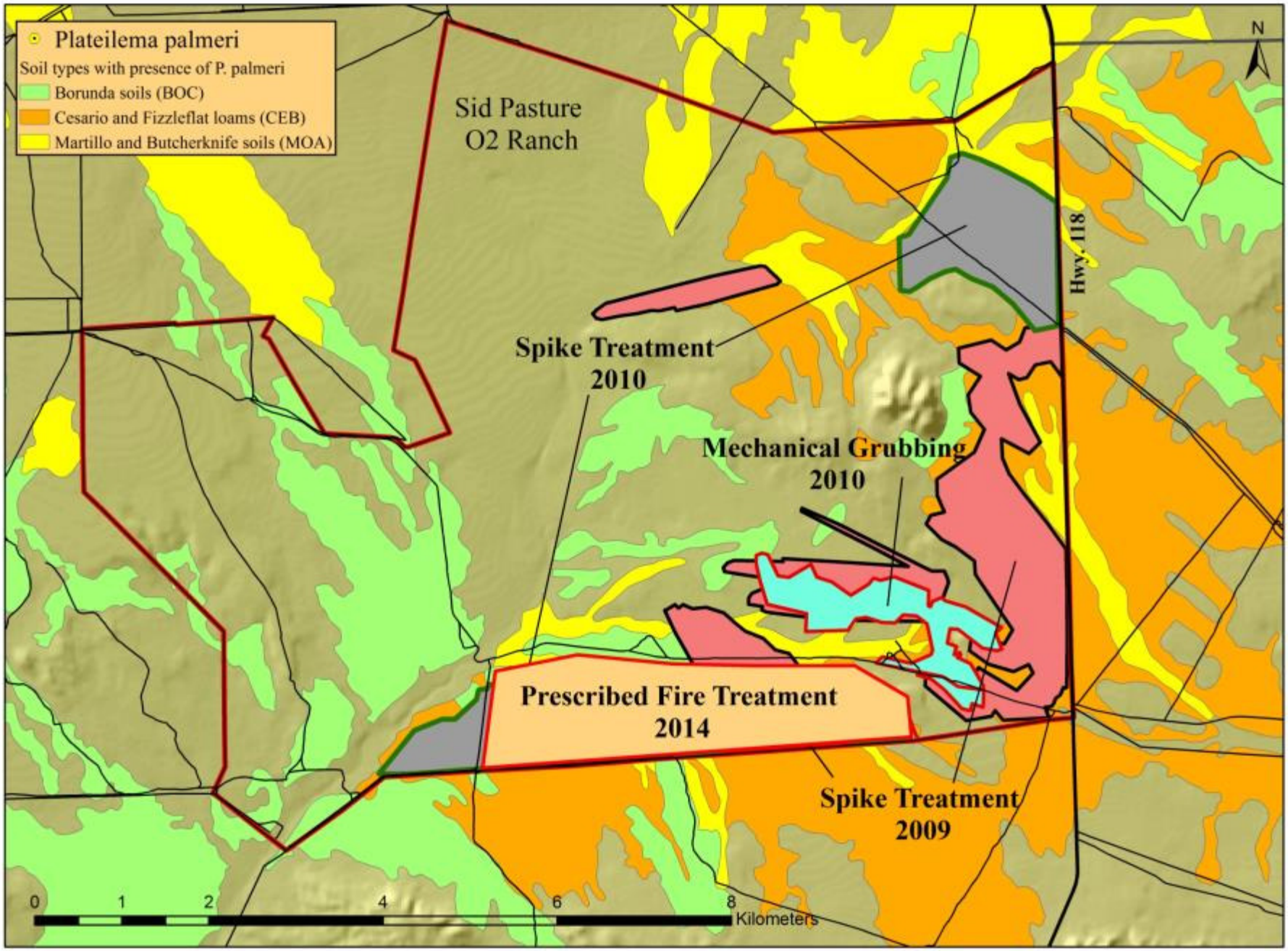
Spike treatments, 2009



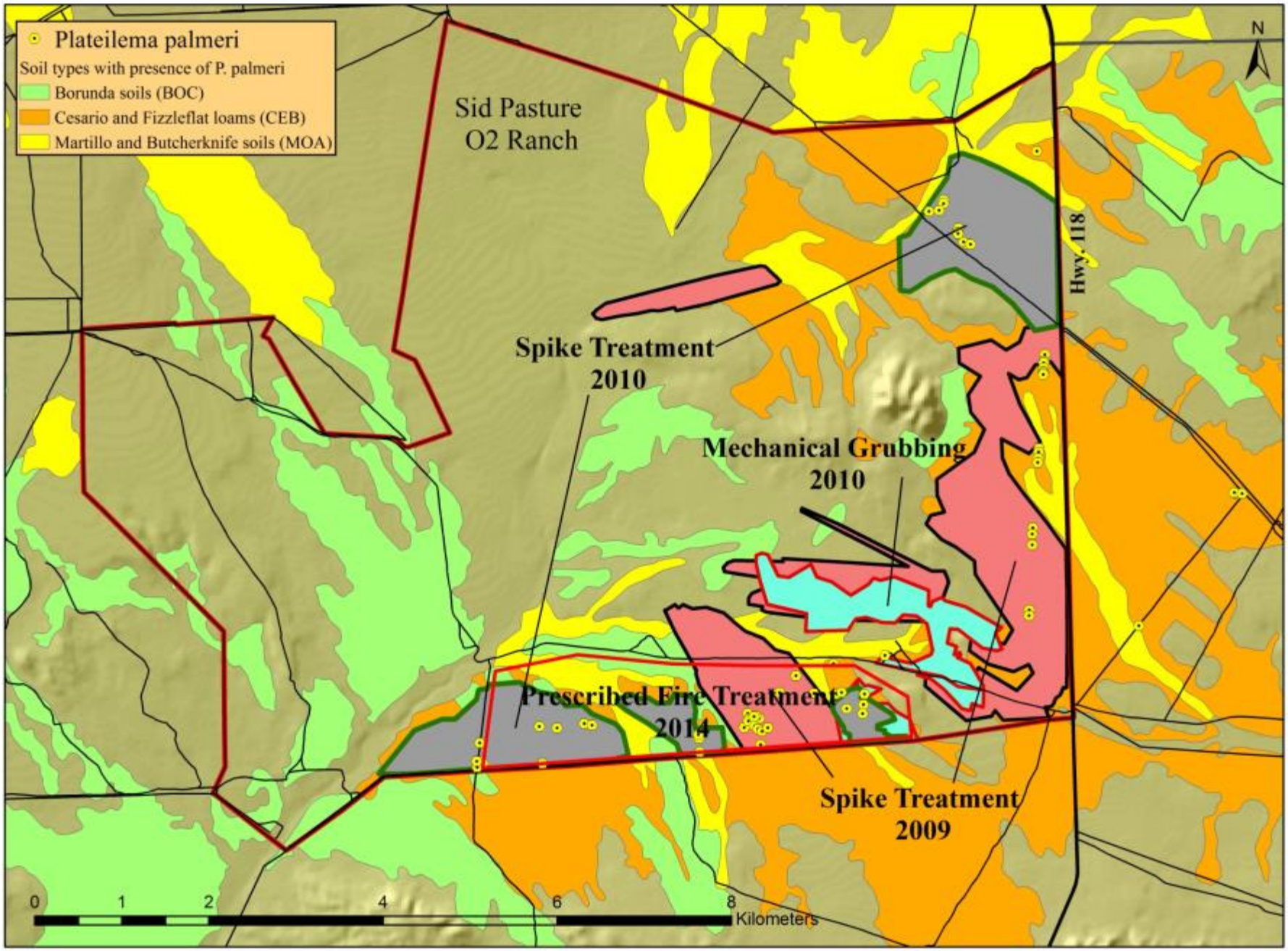
Spike treatments, 2009 and 2010



Mechanical grubbing, 2010



Prescribed fire treatment, 2014



Treatment areas and *P. palmeri* presence in Sid (to date)

What we are finding so far

- *P. palmeri* appears to prefer poorly drained, calcareous soils
  - Cesario and Fizzleflat loams (98%)
  - Borunda soils (1%)
  - Martillo and Butcherknife soils (1%)
- Common association with nurse plants
- Appears to be more abundant within banded vegetation; “islands of diversity”
- Banded vegetation captures a little extra water than the surrounding landscape
- Microhabitats; small depressions; maintaining faunal diversity
  - Similarities to Mexican site; soils, topography, vegetation composition
- Chromosome number; **2*n* = 13II** (Powell and Spellenberg 2013)
  - Identical to Mexican population

P. palmeri growing in association with nurse plants

Habitat, continued

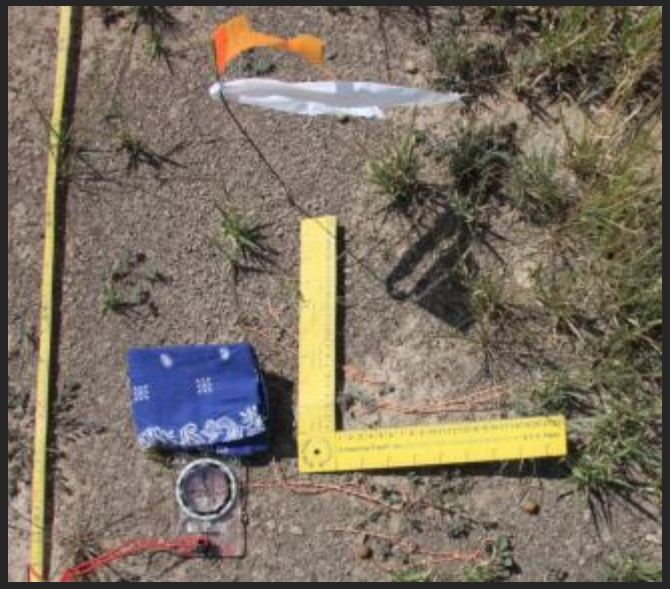
Habitat, continued

Habitat, continued

Habitat, continued

What we don’t know

- Distribution on a broader scale
- Presence/ absence in other ecological sites and soil types
- No data regarding pollinators
- Herbivory
- Recruitment and dispersal
- Chemical analysis
- Perennial or biennial



Pollinators












Method for capturing specimens

To date, have captured a number of solitary bees, butterflies, and flower flies

Herbivory

In Summary…

- *Plateilema palmeri*
  - Much to learn regarding this species
  - Master's thesis work
  - Biodiversity of these desert grasslands, what else may be found?
    - Additionally, 2 new county records found in Sid pasture
      Sanvitalia abertii and *Acleisanthes diffusus*

- Stewardship
  - Foresight by Lykes Brothers, Inc. – O2 Ranch
  - Keeping stocking rates low until ecological condition improves
  - Continued restoration treatments
    - providing as a model for similar ecological sites
  - Improving habitat for wildlife and grassland birds
  - Commitment to ecological integrity

- Future studies
  - Furthering our understanding of restoring desert grasslands
  - Restoring biodiversity

Acknowledgements

I would like to thank the Lykes Brothers, Inc. - O2 Ranch and Homer Mills in allowing for the opportunity of study. Much appreciation is extended to Dr. A. Michael and Shirley Powell in their contributions to field work, insightful and helpful observations, encouragement, and their overall scientific knowledge. Additionally, many thanks to Dr. Bonnie Warnock for her support, interest, oversight, and advice, and to Borderlands Research Institute for providing necessary equipment and vehicles.

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Questions