

# STOPPING THE SPREAD OF *VOLUTARIA* ACROSS THE CALIFORNIA DESERT



Chris McDonald PhD  
University of California  
Cooperative Extension  
[cjmcdonald@ucanr.edu](mailto:cjmcdonald@ucanr.edu)

Photo: Ron Vanderhoff

# EDRR

- ⦿ Early Detection and Rapid Response
  - Develop knowledge about weeds in region
  - ID plants on the landscape
  - Develop a plan to remove weeds
  - Remove weeds



# EDRR

- Early Detection and Rapid Response
  - Develop knowledge about weeds in region
  - ID plants on the landscape
  - Develop a plan to remove weeds
  - Remove weeds

**Detection  
Reporting**



**ID,  
Vouchering**



**Rapid  
Assessment**



**Planning**



**Rapid  
Response**

# Volutaria tubuliflora

- Hundreds of invasive plants in California, relatively few of them are new or can be eradicated



# Volutaria

- First known contact:
- In February 2010 two botanists on a hike notice an unusual plant growing in Alcoholic Pass in ABDSP
- Returning later in the season the plant was missing
  - RT Hawke, Tom Chester



# Trouble Brewing

- April 2011 Anza Borrego Desert State Park field call to see an unusual plant
- Relatively sparse abundance, spread out over few hundred acres, growing like a weed
- Asteraceae, likely centaurea group (Star thistles), none of us could ID
- Our assessment “get rid of it”

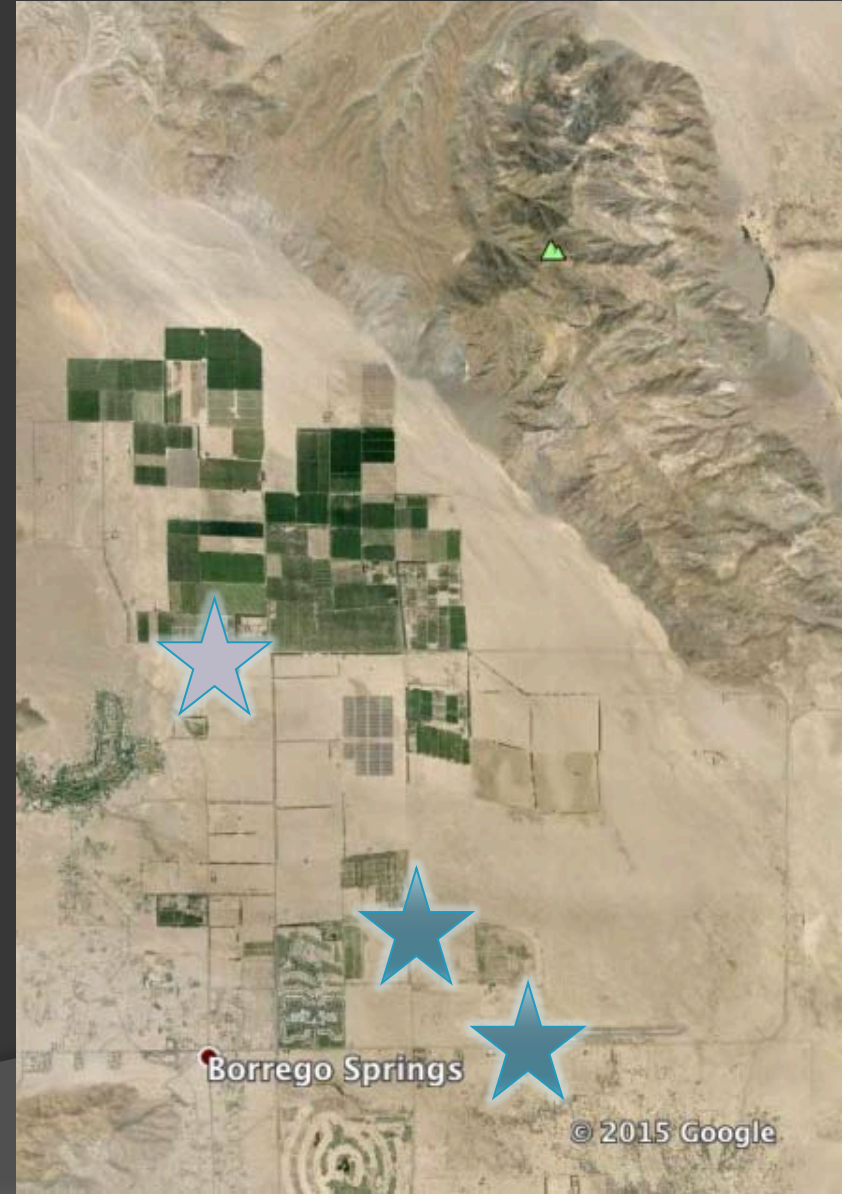
# Vouchered Locations 2011



Over 1 mile apart

# Getting out of hand

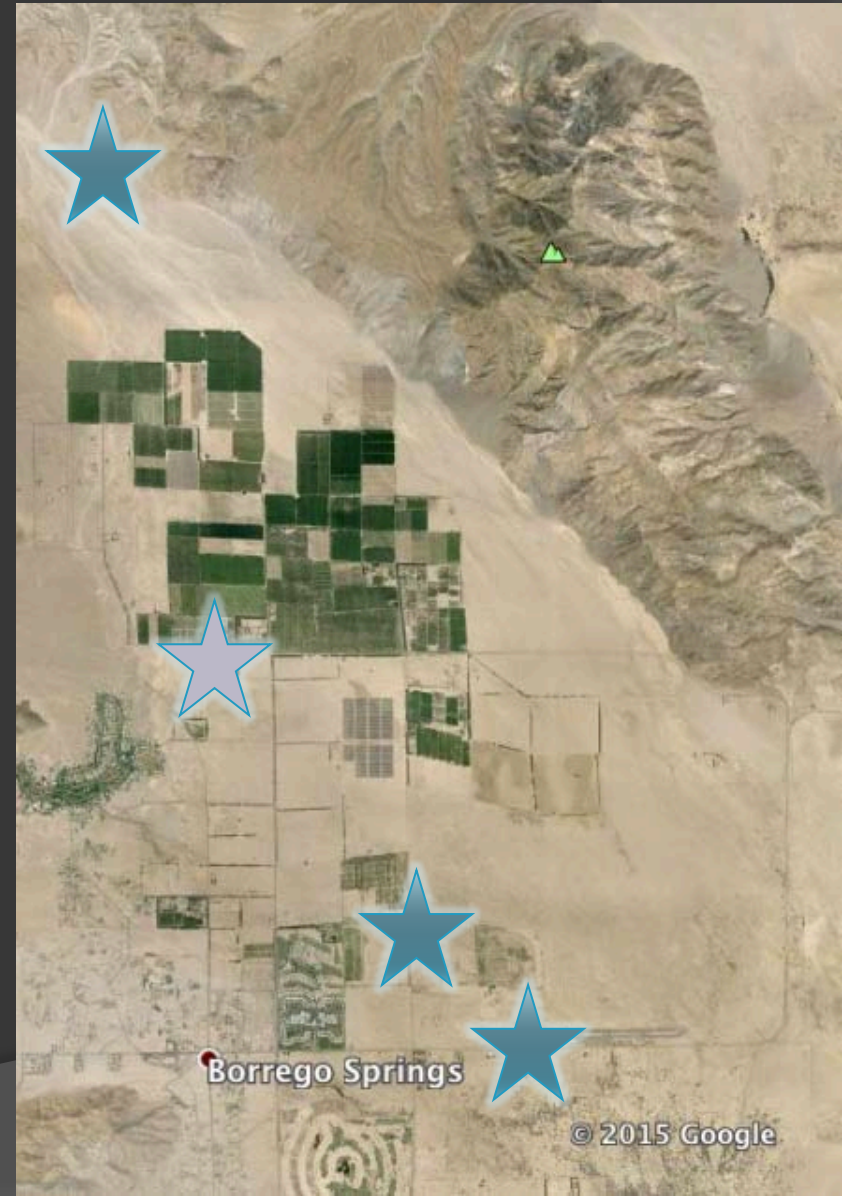
- Additional locations found in 2013





# Red Flag

- Distance between very first sighting and heavier 2011 infestation was 6 miles



# EDRR

- ◎ Early Detection and Rapid Response
  - Develop knowledge about weeds in region
  - ID plants on the landscape
  - Develop a plan to remove weeds
  - Remove weeds



# Nomenclature

“What is in a name? that which we call a  
rose

By any other name would smell just as  
sweet”

- Romeo and Juliet



Tom Chester



# Nomenclature

- New to North America, how to correctly identify the species?



# Nomenclature

- New to North America, how to correctly identify the species?
- Get as close as possible and then contact the experts
- Gerhard Wegenitz revised the genus *Volutaria*



# Nomenclature

- New to North America, how to correctly identify the species?
- Gerhard Wegenzitz revised the genus *Volutaria*
- Photographs sent to him
- ID came back as *Volutaria canariensis*
- Canary Island Knapweed



# Nomenclature

- Canary Island Knapweed
- Endemic to Canary Islands



# Nomenclature



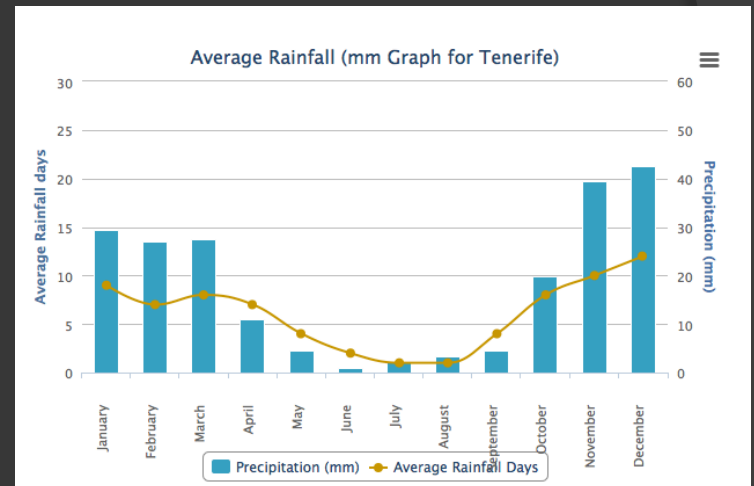
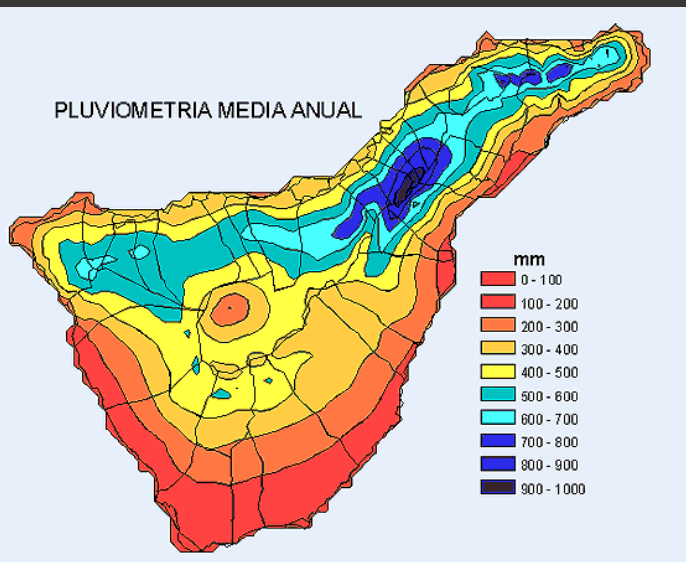
- Canary Island endemic
- Virtually no information on the ecology of this species
- How did it travel?





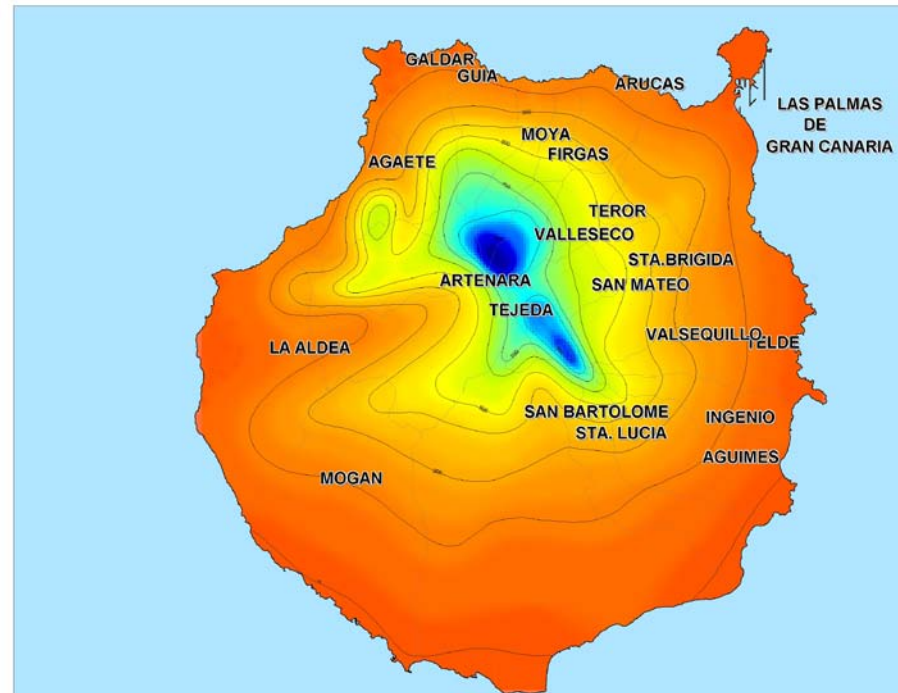
# Canary Islands

- West coast of Africa, Mediterranean climate
- From <4 to 40 in. precip.



# Canary Islands

- *V. canariensis*, winter annual <400 mm precip 16 in. and <600 m elev. 2000 ft.



# Canary Islands

## ◎ *V. canariensis*



# Canary Islands

- ◎ *V. canariensis*
- ◎ The pictures of the flowers and the habitat matched
- ◎ Colleagues in Spain thought our plants looked different



# Nomenclature

- In winter 2015 colleagues in Spain suggested our identification was incorrect



California

Tom Chester  
Ron Vanderhoff



© Jesús Palenzuela Borges  
<http://www.herbariumvirtual.com>

Canary Islands



© Jesús Palenzuela Borges  
<http://www.herbariumvirtual.com>

# *Volutaria tubuliflora*

Canary Islands



California



# Nomenclature

Alfredo Reyes

Alfredo Reyes



Tom Chester  
Ron Vanderhoff

Alfredo Reyes

*V. canariensis*

*V. tubuliflora*



Sally Whymark



*V. tubuliflora*



Phillipe Marin



# Nomenclature

- ⊙ ~~Volutaria canariensis~~
- ⊙ Volutaria tubuliflora



# Nomenclature



- ⊙ ~~Volutaria canariensis~~
- ⊙ Volutaria tubuliflora
- ⊙ Why the white flowers?



# Nomenclature

- Currently accepted name *Volutaria tubuliflora*
- No 'common' common names
- Egyptian knapweed
- Mediterranean knapweed
- *Volutaria*
- Cardo manso de burro
  - Meek burro thistle
- Burro Knapweed

# EDRR

- ◎ Early Detection and Rapid Response
  - Develop knowledge about weeds in region
  - ID plants on the landscape
  - Develop a plan to remove weeds
  - Remove weeds



# *V. canariensis* Range



# *V. tubuliflora* Range



# *V. tubuliflora* Literature



- Several studies on *V. tubuliflora*
- In home range common along roadsides and dryland and irrigated agriculture
- Recently arrived in Saudi Arabia, likely due to contaminated farming equipment
  - Tellier et al. 2014 Gayana Botanica
- From 6 in. to 5 ft. tall.
- It is a colonizer!



# *V. tubuliflora* invasion

- Invading Atacama Desert in Chile



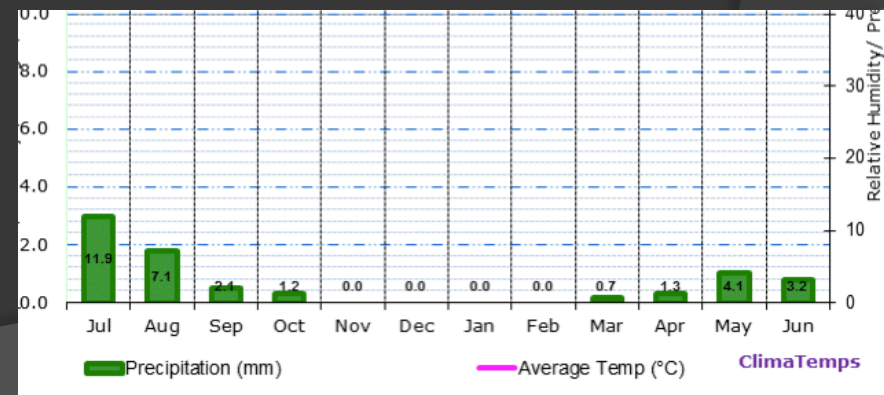


- Spread 80 miles in approx. 30 years
- Hyper arid desert
- Vallenar 30 mm precip.
- Copiapo 20 mm



# Vallenar, Chile

- Agricultural and suburban city



# Nomenclature



- ⊙ ~~*Volutaria canariensis*~~
- ⊙ *Volutaria tubuliflora*
- ⊙ Why the white flowers?

California



Chile



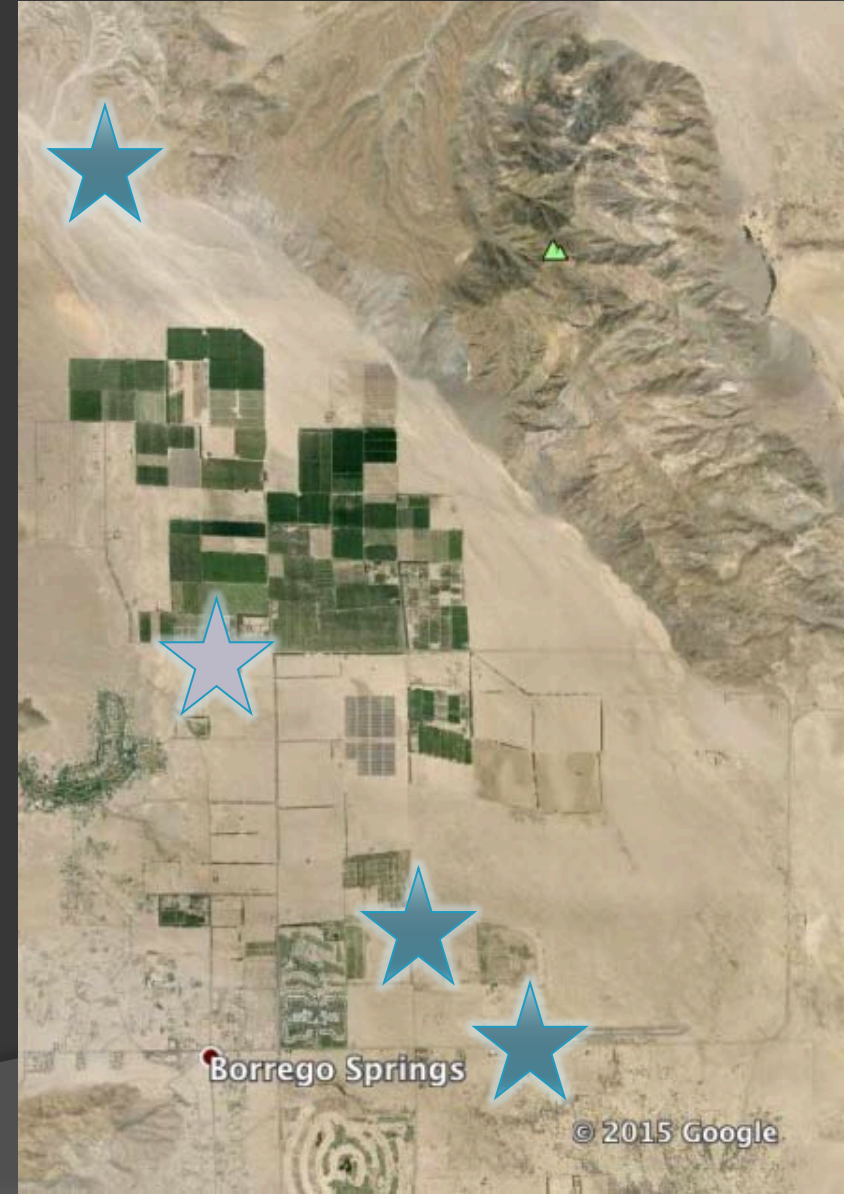
Sebastian Tellier

# World Traveler



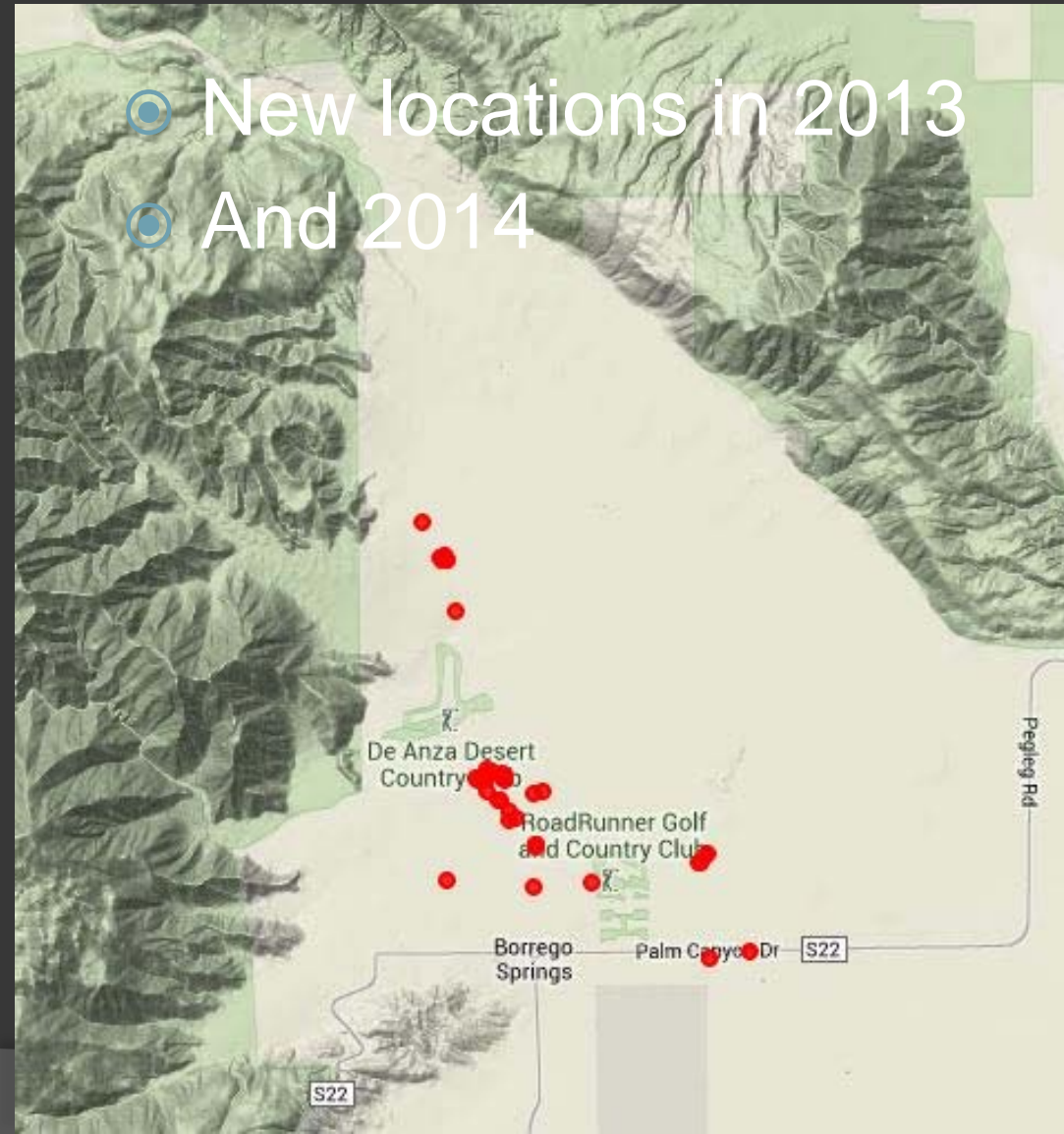
# Rapid Assessment

- Its spreading in Borrego Springs
- 6 miles from initial sighting to second infestation
- New infestations in 2013



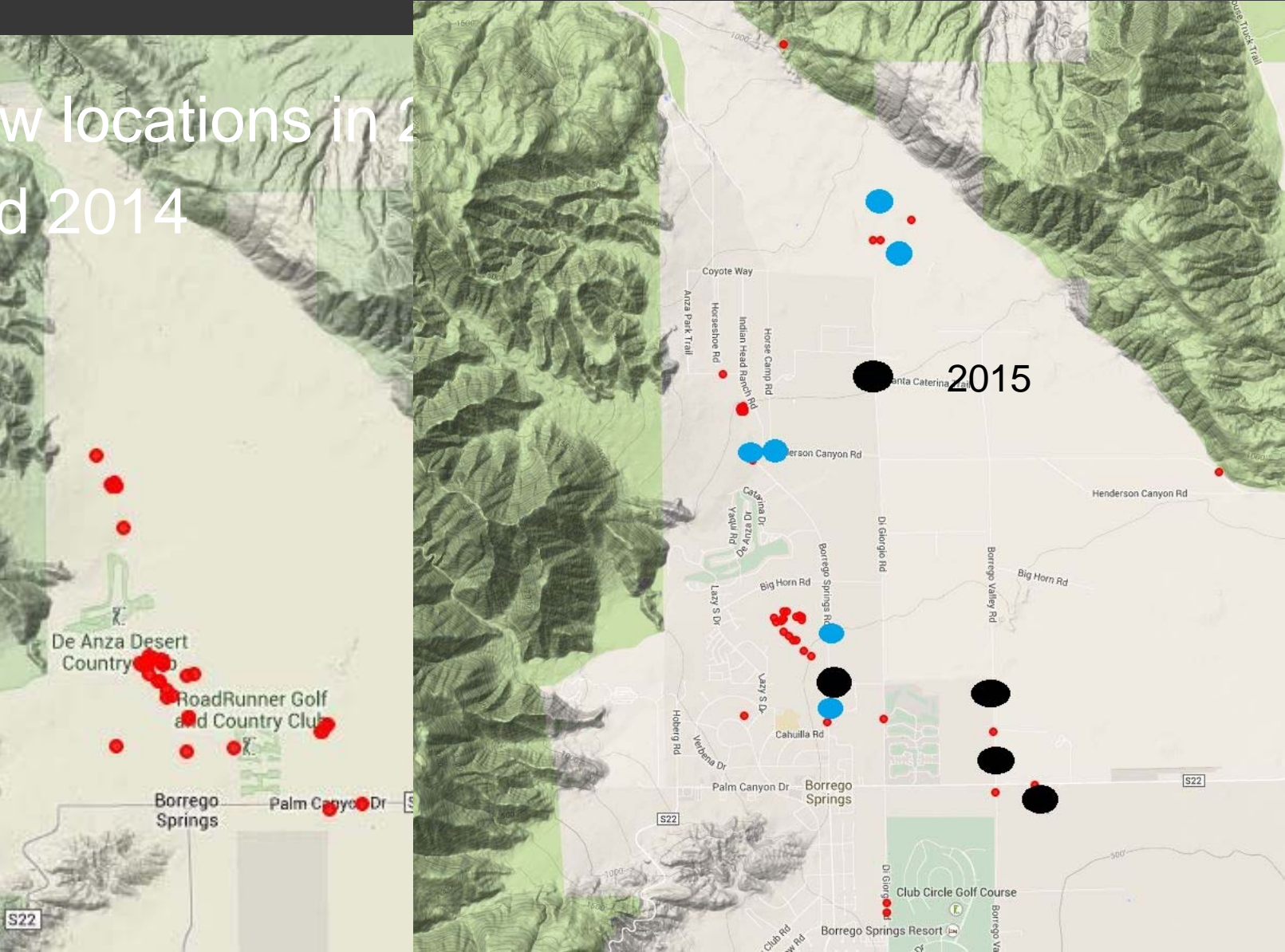
# Rapid Assessment

- New locations in 2013
- And 2014



# Rapid Assessment

- New locations in 2013
- And 2014



# EDRR

- ◎ Early Detection and Rapid Response
  - Develop knowledge about weeds in region
  - ID plants on the landscape
  - Develop a plan to remove weeds
  - Remove weeds

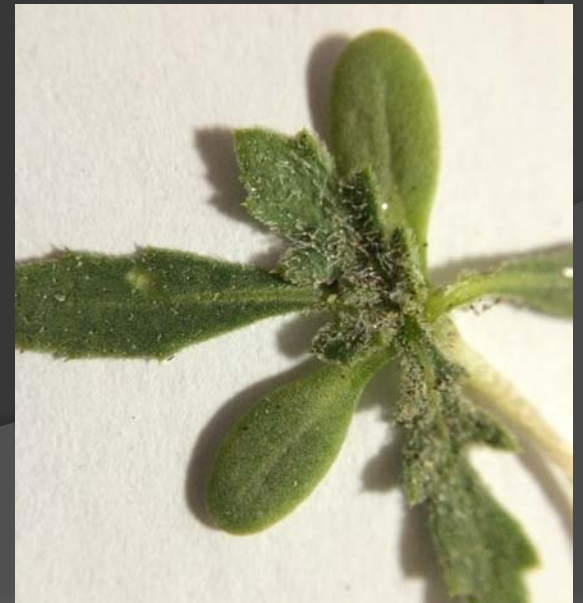






# Partners

- ⦿ Anza Borrego Desert State Park
- ⦿ San Diego County Agricultural Commissioner
- ⦿ Ca Dept. Food and Agriculture
- ⦿ Borrego Springs Sahara Mustard Task Force
- ⦿ Anza Borrego Desert Natural History Assn.
- ⦿ UC Irvine
- ⦿ UC Cooperative Extension
- ⦿ BLM
- ⦿ Local Landfill, nurseries, ag. ...



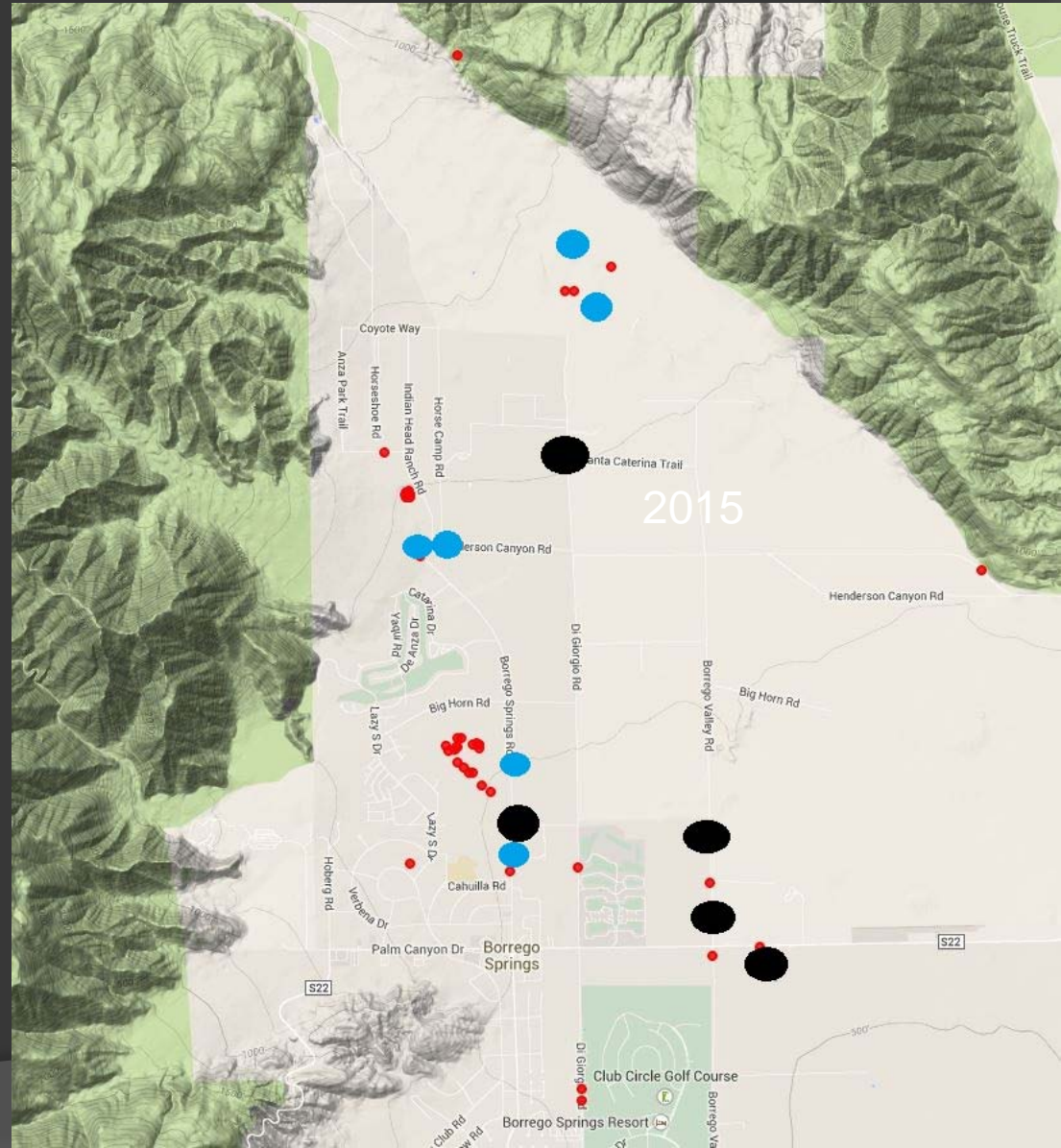
# Limitations

- ⦿ Agencies cannot easily work across jurisdictions or private property
- ⦿ How to organize volunteers when working outside your property?
- ⦿ How to cover large areas?
- ⦿ Who removes from private property?
  - Especially vacant landowners



# Limitations

- Drought has led to sporadic rainfall in Borrego Springs each year
- Only finding it in areas with storms



# EDRR

- ◎ Early Detection and Rapid Response
  - Develop knowledge about weeds in region
  - ID plants on the landscape
  - Develop a plan to remove weeds
  - Remove weeds



# Rapid Response

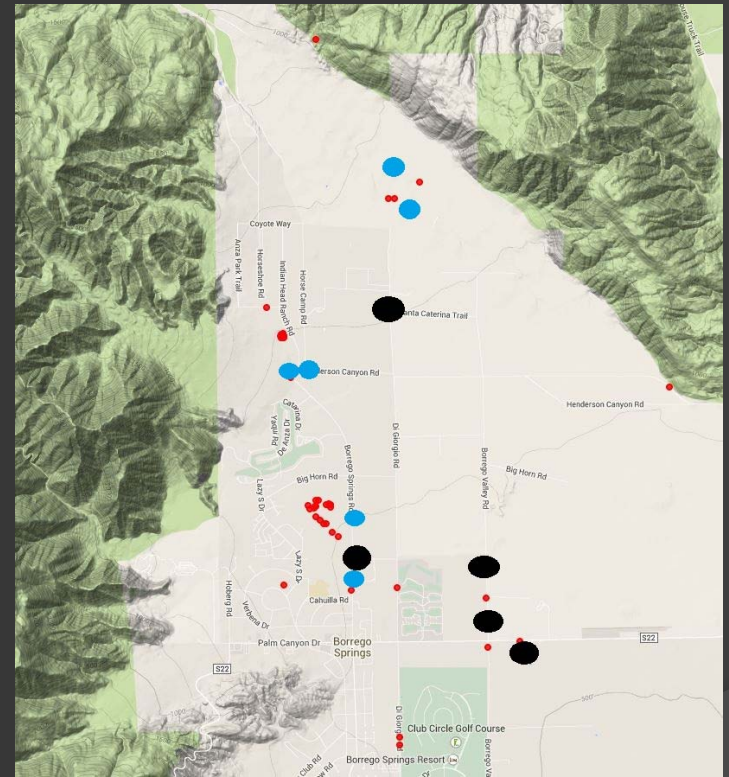
- 5 years since first detection
- Volunteer pulling efforts
- Road side spraying
- Mapping
- Community Meetings
- Nursery Monitoring
- Grants
  - None successful yet



Frank Harris

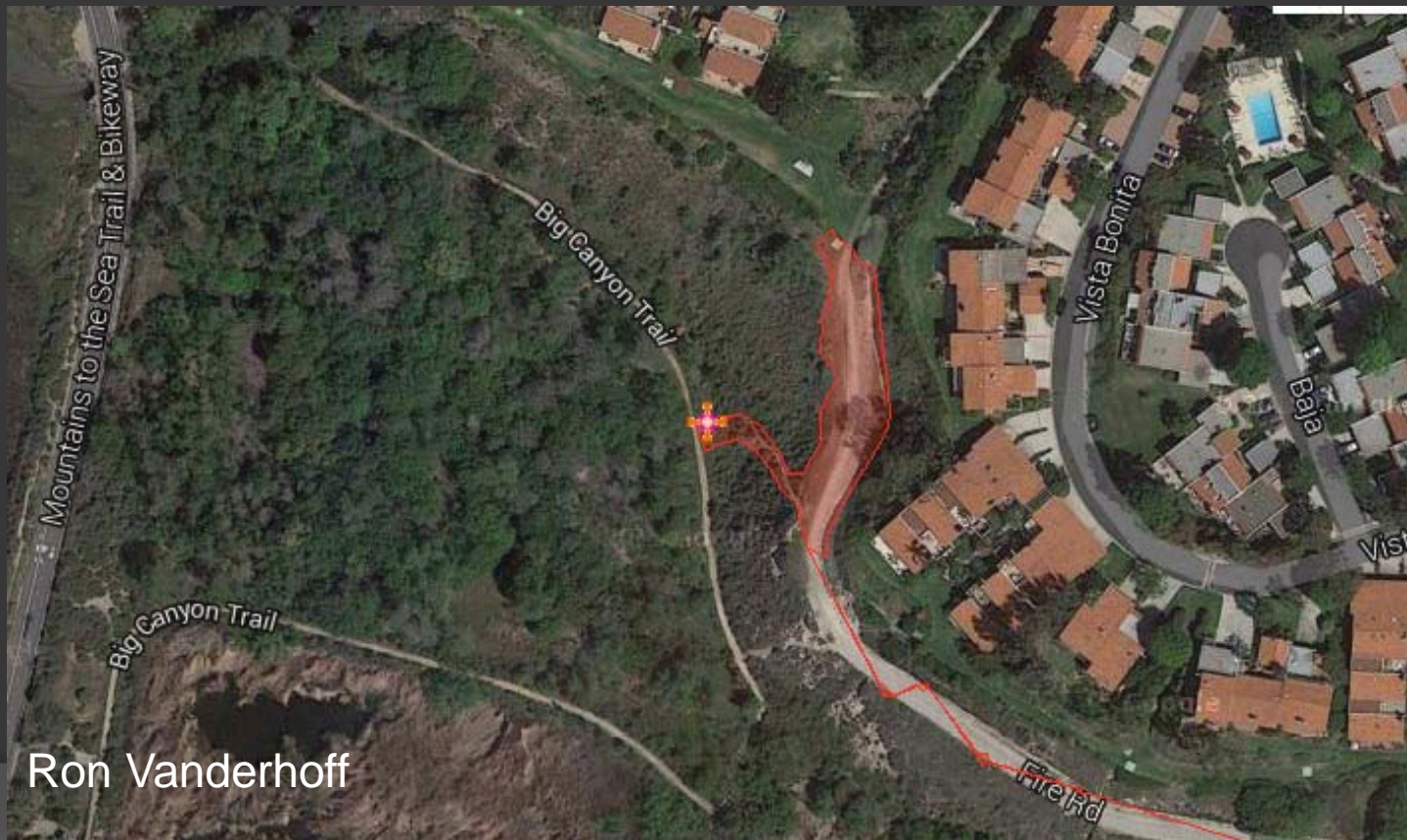
# Additional items

- Professional removal
- Paid coordination
- City-wide mapping
- Local infestation reporting system
- Additional monitoring
- County-wide alerts



# Spread

- Upper Newport Bay, Newport Beach
- ~3,000 plants pulled in 2015





# Volutaria Spread



# Questions?



[cjmcdonald@ucanr.edu](mailto:cjmcdonald@ucanr.edu)

Frank Harris