

# Mapping for Successful Management

Kayla Malone

Chaffee County Noxious Weed Department Supervisor

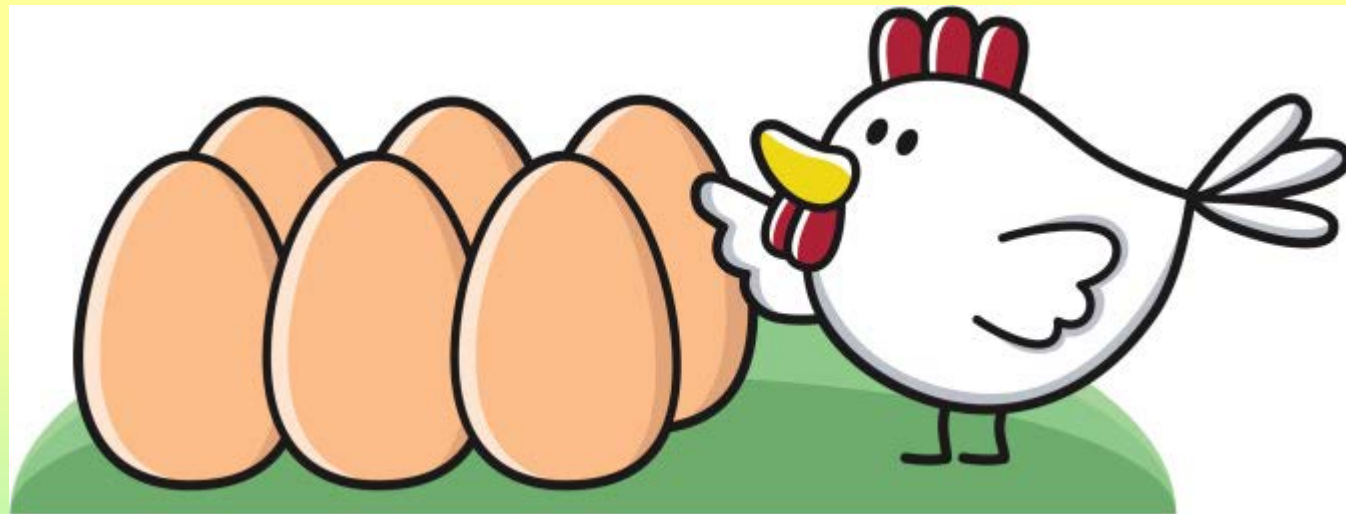
# Outline

- Mapping and CDA guidelines
- EDDMapS
- Point, line, or polygon?
- Plant life cycles
- Examples of implementation

# Mapping is DATA

Data is used to answer questions!

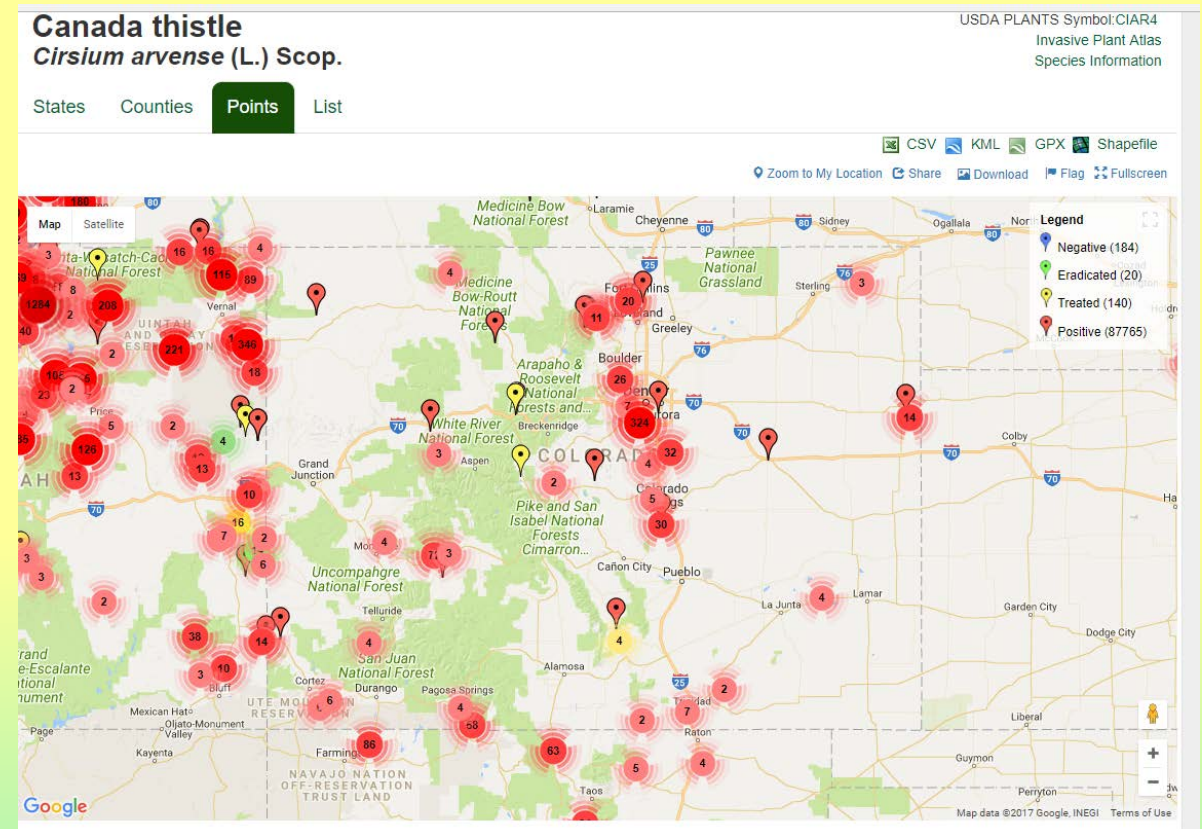
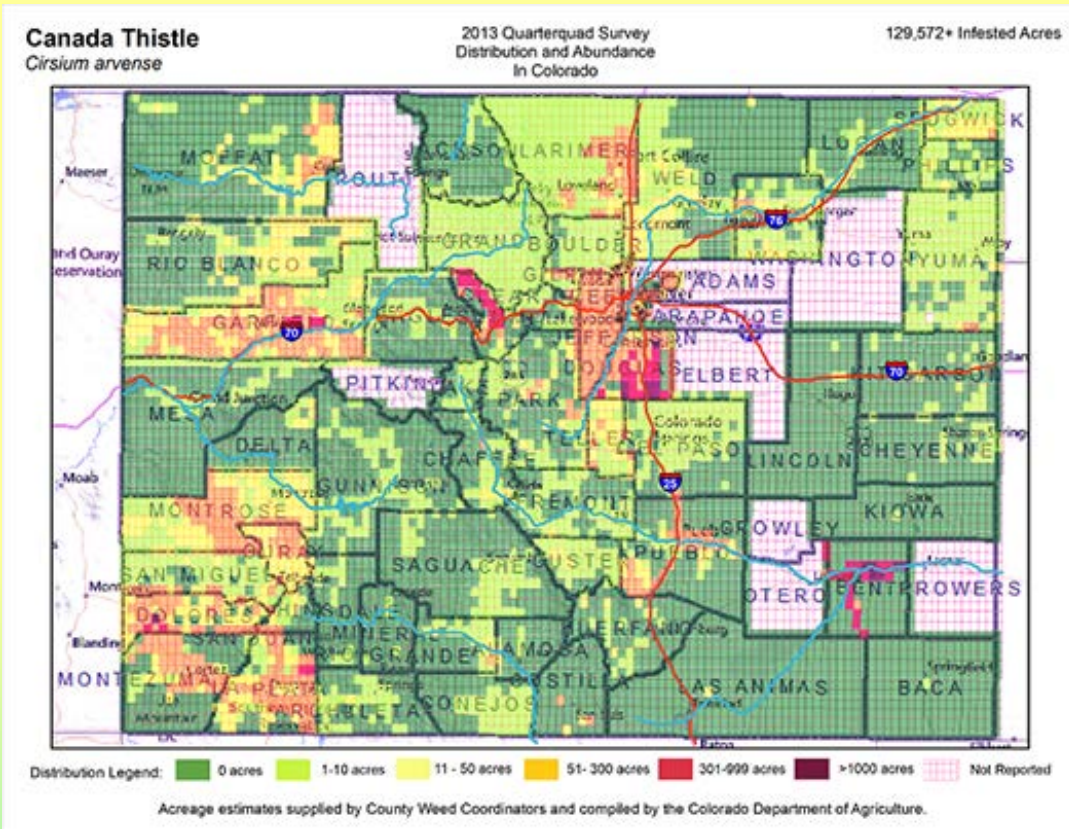
- Develop mapping procedures that reflect the challenges and objectives of your program.
- Develop objectives that reflect the established mapping procedures.



# Mapping for State Compliance

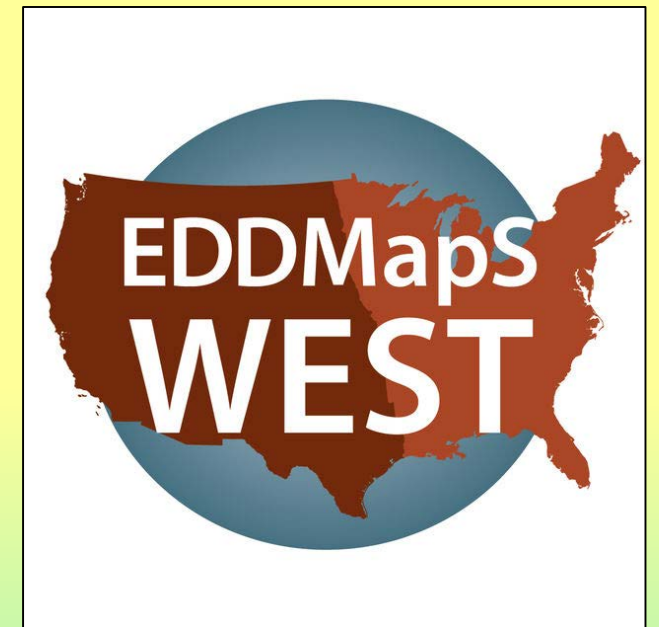
Colorado Department of Agriculture mapping system:

- Historically, Quarter Quads.
- Moving to EDDMapS.



# EDDMapS & EDDMapS West

- Free, accessible, easy to use mapping software.
- NEW – Colorado State Wide Mapping System!!!
- Identification tools, pictures, distribution maps.
- State-specific species lists!
- Control and management reporting tools.
- Training tools, guides, walk-throughs, demos.
- Mobile Data and WIFI only upload options.
- Notifications for local managers.



# EDDMapS Data Requirements

- Observation Date (Automatically recorded in the app!)
- Scientific Name
- Common Name
- State (Automatically recorded in the app!)
- County (Automatically recorded in the app!)
- Latitude and Longitude (Automatically recorded in the app!)
- Reporter (Automatically recorded in the app!)
- Gross Area and Units
- Some measurement of the frequency of occurrence (Canopy Closure, density, abundance, number of plants, stem count)



# EDDMapS

Early Detection & Distribution Mapping System

Home

Report Sightings

Distribution Maps

Species Information

Tools & Training

My EDDMapS

About

sign out



## What are Invasive Species?

Any species that is non-native to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. These non-native species aggressively compete with and displace the associated flora and fauna communities.

## Projects

- ✓ Southeast Early Detection Network
- ✓ EDDMapS West
- ✓ EDDMapS Midwest
- ✓ Mid-Atlantic Early Detection Network
- ✓ Invasive Plant Atlas of New England
- ✓ Florida Invasive Species Partnership
- ✓ EDDMapS Alberta - Alberta Invasive Plants Council
- ✓ EDDMapS Ontario
- ✓ EDDMapS Prairie Region - Manitoba and Saskatchewan
- ✓ Biological Control Agents of Weeds
- ✓ What's Invasive
- ✓ National Wildlife Refuge Early Detection Network for New England
- ✓ Appalachian Trail Conservancy
- ✓ Invaders of Texas
- ✓ Alaska Exotic Plant Information Clearinghouse
- ✓ New Invaders Watch Program
- ✓ Outsmart Invasive Species
- ✓ ReportIN - Indiana



Search:

Subject Name	Scientific Name	Records	View
Canada thistle	<i>Cirsium arvense</i>	41,902	State   County   Point   List
Dalmatian toadflax	<i>Linaria dalmatica</i>	38,877	State   County   Point   List
squarrose knapweed	<i>Centaurea virgata</i>	34,352	State   County   Point   List
Scotch broom	<i>Cytisus scoparius</i>	23,426	State   County   Point   List
bull thistle	<i>Cirsium vulgare</i>	22,621	State   County   Point   List
musk thistle	<i>Carduus nutans</i>	21,202	State   County   Point   List
common St. Johnswort	<i>Hypericum perforatum</i>	20,180	State   County   Point   List
hoary cress	<i>Lepidium draba</i>	19,312	State   County   Point   List
tansy ragwort	<i>Jacobaea vulgaris</i>	16,689	State   County   Point   List
Scotch thistle	<i>Onopordum acanthium</i>	16,620	State   County   Point   List
Himalayan blackberry	<i>Rubus armeniacus</i>	16,533	State   County   Point   List
yellow starthistle	<i>Centaurea solstitialis</i>	14,815	State   County   Point   List
spotted knapweed	<i>Centaurea stoebe ssp. micrantha</i>	14,528	State   County   Point   List



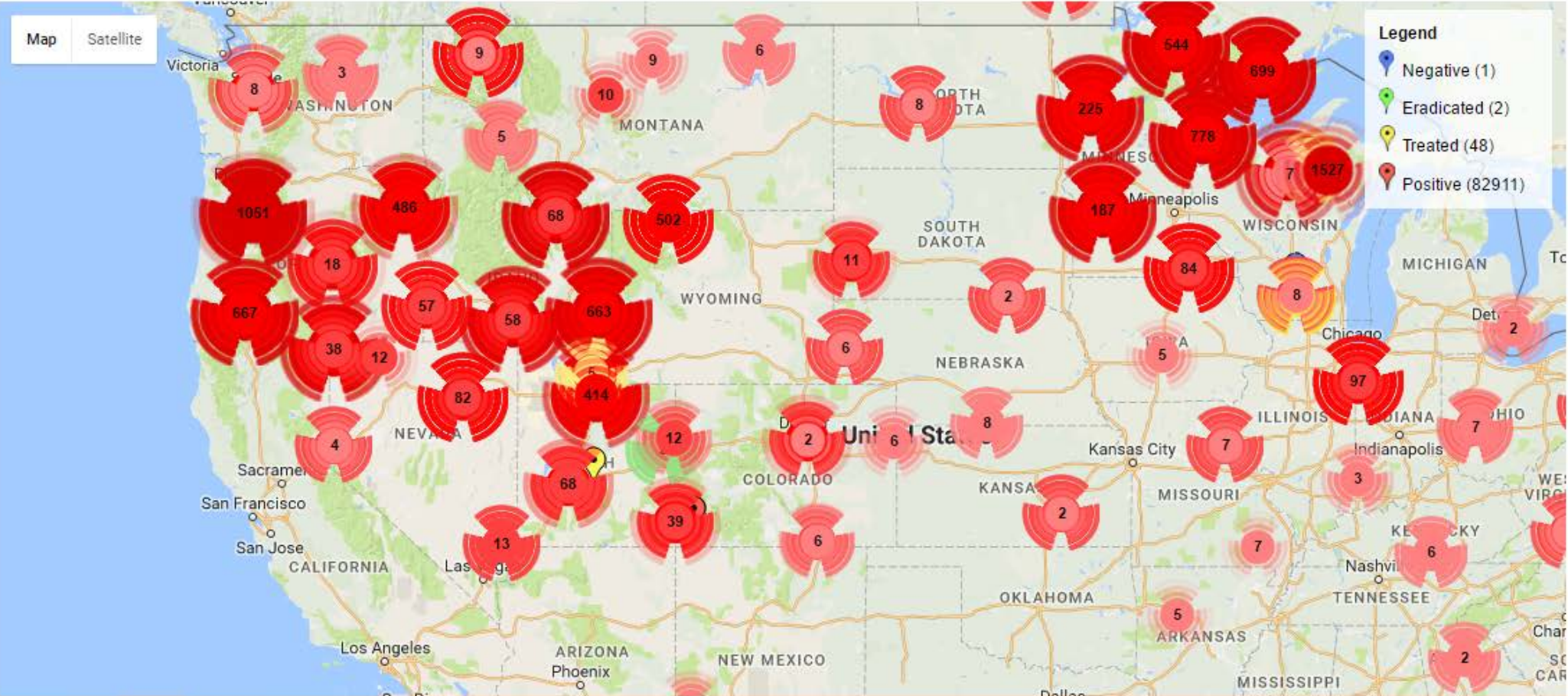
# Cirsium arvense (L.) Scop.

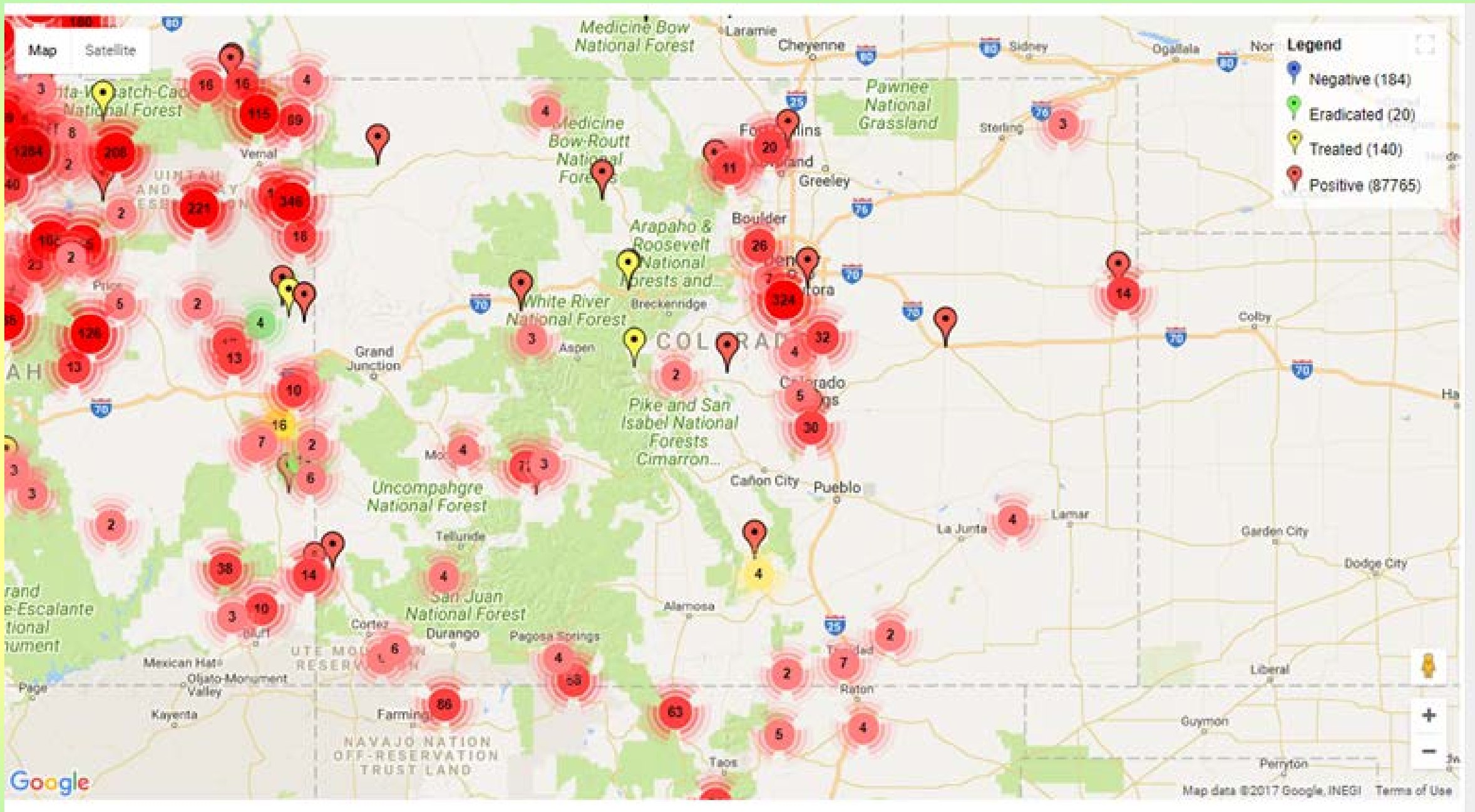
Species Information

States Counties **Points** List

CSV KML GPX Shapefile

Zoom to My Location Share Download Flag Fullscreen

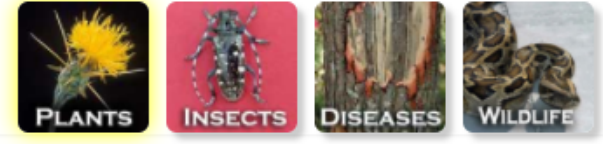






## Projects

- ✓ Southeast Early Detection Network
- ✓ EDDMapS West
- ✓ EDDMapS Midwest
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- ✓ ReportIN - Indiana



# Report an Invasive Plant Occurrence

Red fields are required.

## Species

Pest (?):

## Infestation

Status:  Positive (?)  Treated (?)

Observation Date (?):

Infested Area (?):

Gross Area (?):

Habitat (?):

**Observation Date (?):**

**Infested Area (?):**

**Gross Area (?):**

**Habitat (?):**

**Canopy Closure (?):**

**Abundance:**

**Plant Description:**

- Mature
- Sapling/Immature
- Seedling/Rosette
- In Flower
- In Fruit
- Seeds
- Dormant/Dead
- Unknown

**Location**

**State:**

**County:**

**Latitude (?):**

**Longitude (?):**

Must be expressed in Decimal Degrees (XX.XXXX), and DATUM NAD83/WGS84.

Must be expressed in Decimal Degrees (XX.XXXX), and DATUM NAD83/WGS84.

- lat/long conversion tools
- place marker at position
- clear map

**Location Description/Nearest Address:**



Latitude (?):

Must be expressed in Decimal Degrees (XX.XXXX), and DATUM NAD83/WGS84.

Longitude (?):

Must be expressed in Decimal Degrees (XX.XXXX), and DATUM NAD83/WGS84.

Location Description/Nearest Address:

Ownership:

\* If reporting infestation on private land, be sure to have landowner's permission.

Private (?):  Yes  No

### Images

Image 1:

(.jpg)

Caption:

Image 2:

(.jpg)

Caption:



# EDDMapS West Application

- Android or Apple.
- Same login information.
- Save species to a quick access list.
- Automatically records: Date, Time, Location, Accuracy.
- Attach photos to records.
- Saves records in a queue until internet is available.
- Easy to use reporting system!
- I receive notifications of new records and reports!








# EDDMapS West

- Download in Google Play or Apple Stores – FREE – created by bugwood.
- Sign up or sign in with existing account information.





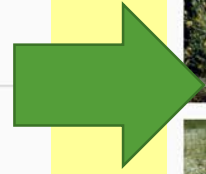
EDDMapS West

-  Species Categories  
Report and view species by category
-  All Species  
Full list of all species available for reporting
-  My Species List  
Short list of your selected species
-  **State Species List**  
List of species by state
-  Montana Noxious Weed Key  
Identify a species using key descriptors
-  Negative Survey  
Submit a negative survey report
-  Upload Queue  
View, edit, or upload your reports















← State Species List

- Arizona
- Colorado**
- Idaho
- Kansas
- Missouri
- Montana
- Nebraska
- Nevada



← Colorado

LIST A

-  **Alhagi maurorum**  
camelthorn 
-  **Centaurea nigrescens**  
alpine knapweed 
-  **Centaurea solstitialis**  
yellow starthistle 
-  **Centaurea virgata**  
squarrose knapweed 
-  **Chondrilla juncea**  
rush skeletonweed 
-  **Crupina vulgaris**  
common crupina 

LIST A



**Alhagi maurorum**  
camelthorn



**Centaurea nigrescens**  
alpine knapweed



**Centaurea solstitialis**  
yellow starthistle



**Centaurea virgata**  
squarrose knapweed



**Chondrilla juncea**  
rush skeletonweed



**Crupina vulgaris**  
common crupina



9:16 62% 3G

← Chondrilla juncea  
rush skeletonweed ☆ REPORT

INFO IMAGES MAP

## General Description

*Chondrilla juncea*, Rush skeletonweed is an erect perennial forb that is native to Eurasia. It commonly invades range lands, where it can severely reduce crop yields and forage for livestock and wildlife. Rush skeletonweed can be identified by its overall skeleton-like appearance. It reproduces by seeds and lateral root buds. Rosettes develop one or more flowering stems, up to 4 ft. (1.2 m) tall, with numerous wiry branches that exude a milky, white sap when broken. Stems are nearly leafless and highly branched, with the lowest 4–6 in. (10.2-15.2 cm) covered in coarse, bristly, downward-pointing hairs. Rigid stems with downward-pointing hairs persist long after flowering, with reddish leaves and clusters of old flower heads. Lower stems are covered with coarse, downward-pointing, reddish-brown hairs. Upper stems are usually hairless and have very few leaves. An extensive, deep taproot produces short, creeping, lateral roots. Plants grow as basal rosettes until flowering stems develop. Family: Asteraceae (aster, composite).

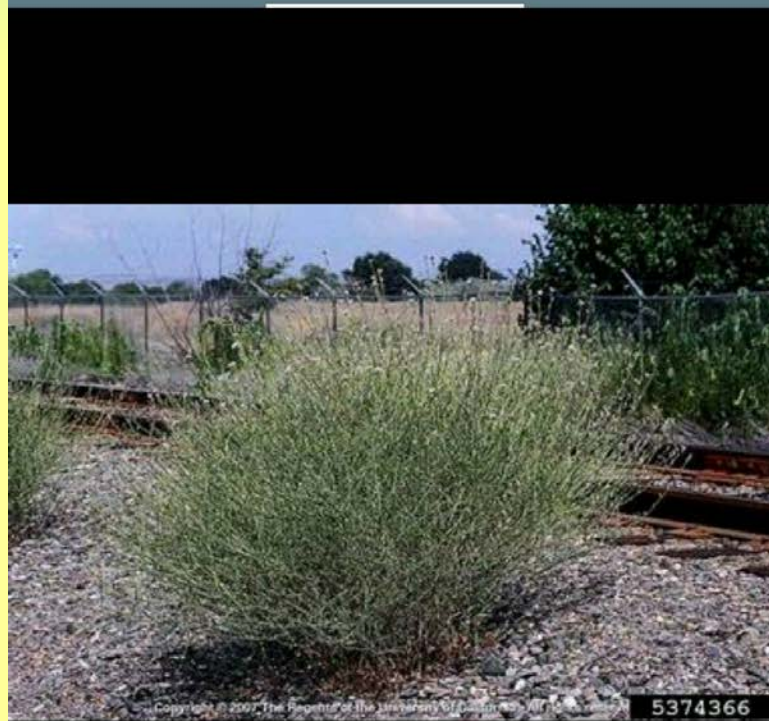
## Leaves

Rosette leaves are dandelion-like, 1.5–5 in. (3.8–12.7

9:16 62% 3G

← Chondrilla juncea  
rush skeletonweed ☆ REPORT

INFO IMAGES MAP



HD

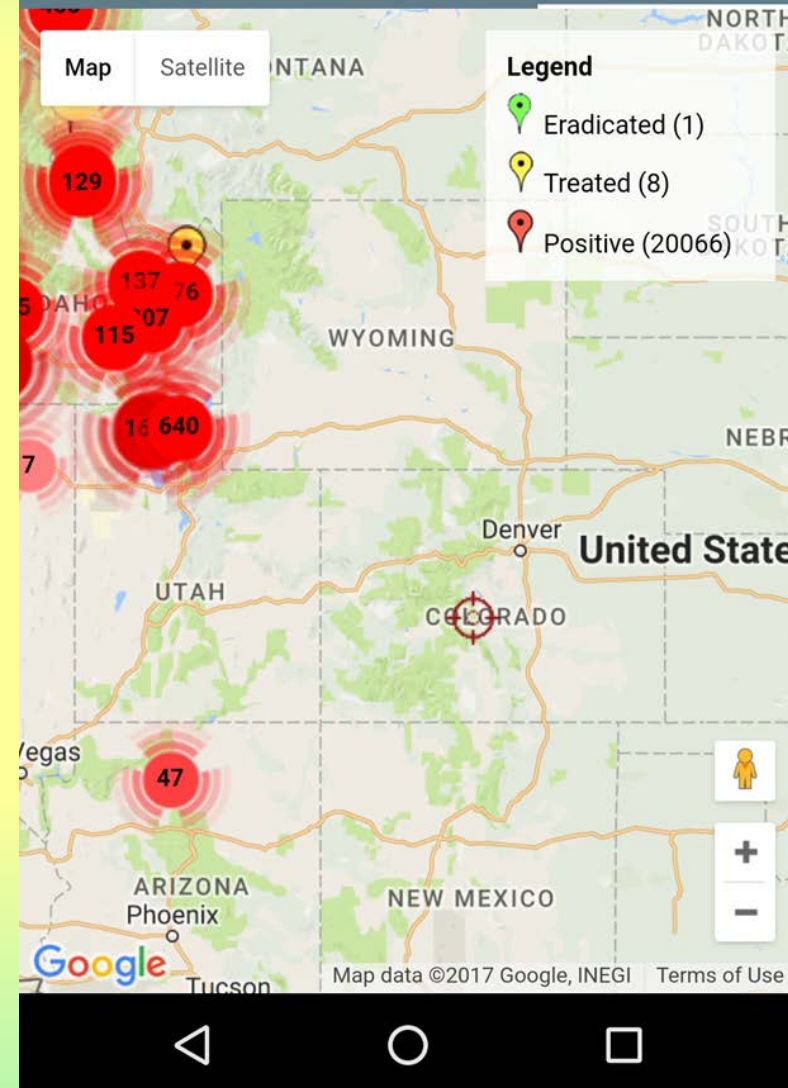
Joseph M. DiTomaso, University of California - Davis

●○○○

9:17 62% 3G

← Chondrilla juncea  
rush skeletonweed ☆ REPORT

INFO IMAGES MAP

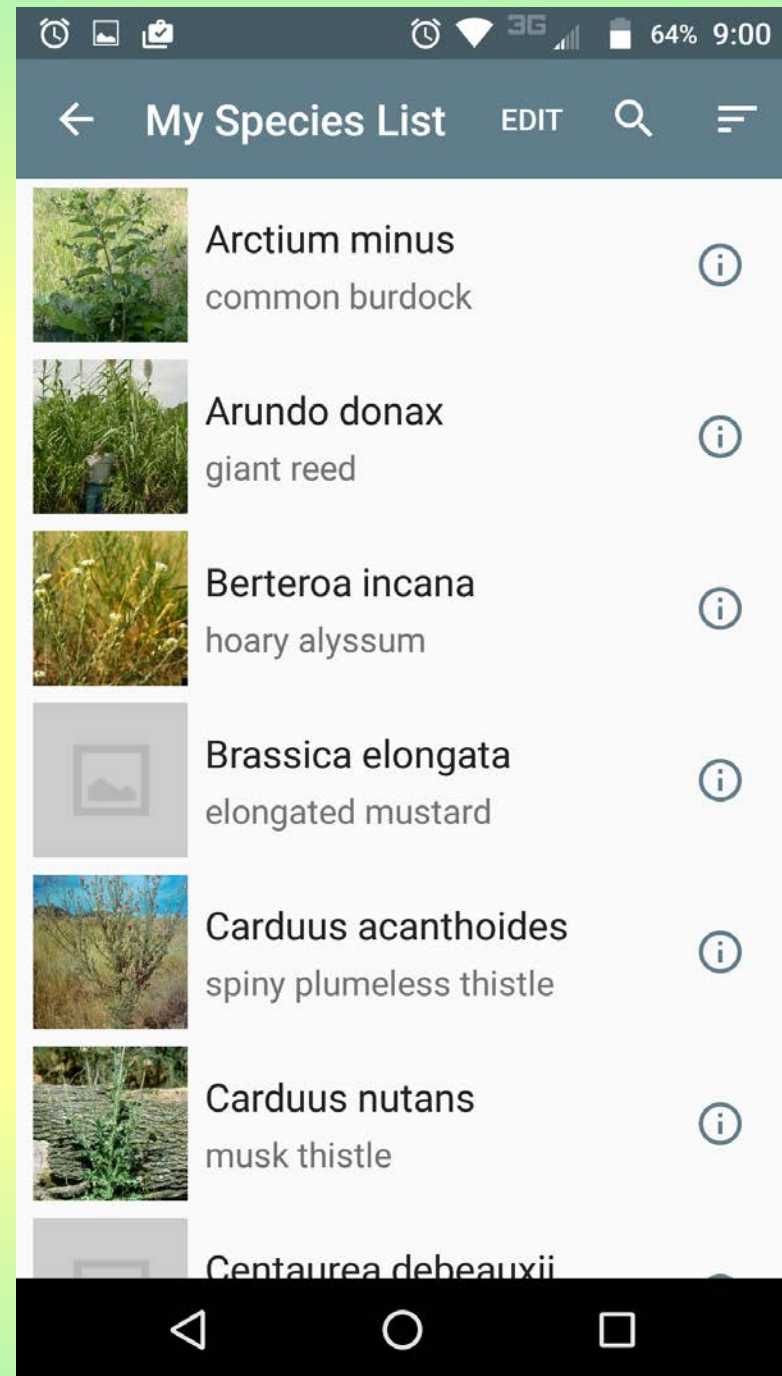
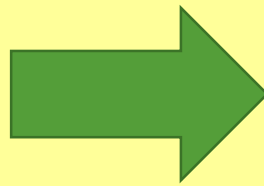
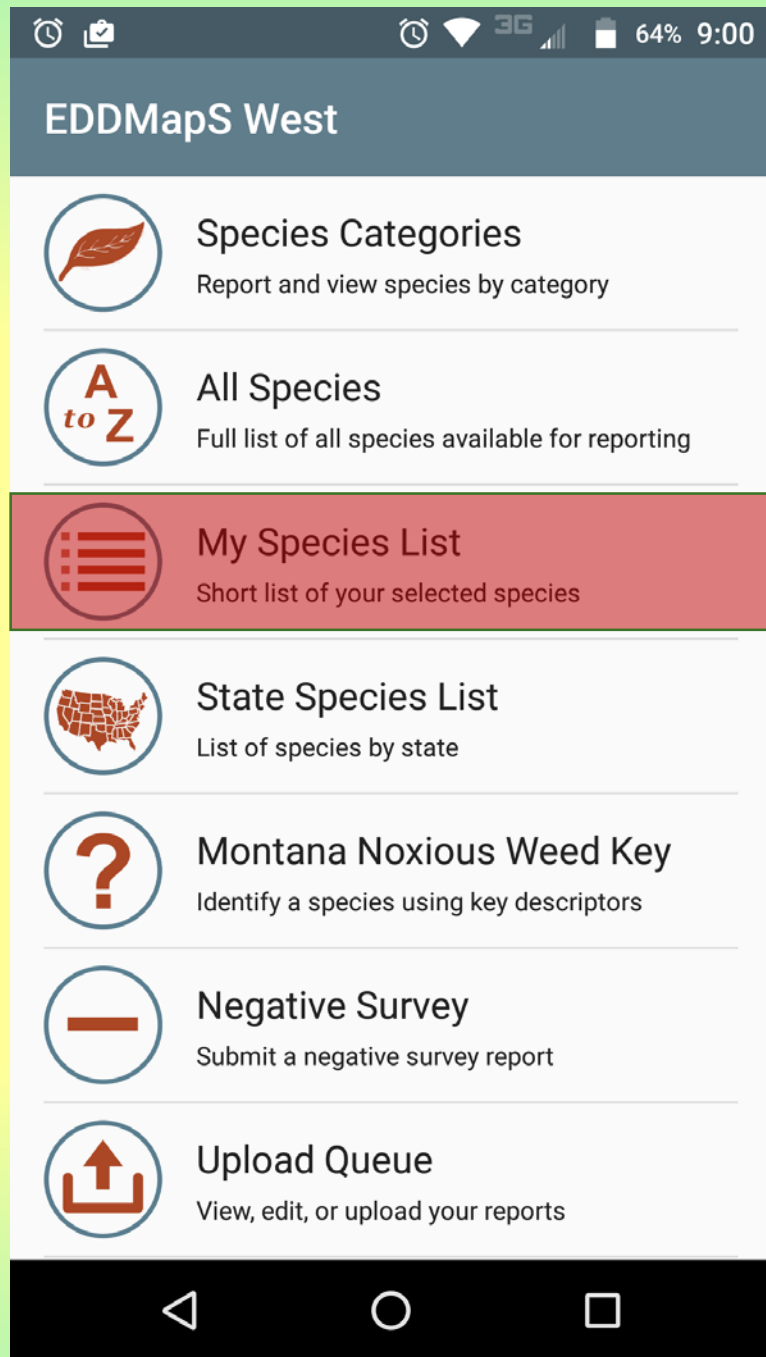


### General Description

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### Leaves

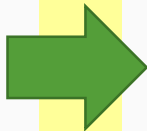
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Colorado

LIST A

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squarrose knapweed
-  **Chondrilla juncea**  
rush skeletonweed
-  Crupina vulgaris  
common crupina




Report an Observation


Chondrilla juncea  
rush skeletonweed

2017-05-12 9:31 AM

ATTACH IMAGES

No images 

LOCATION

lat: 38.250112  
lng: -105.947671  
accuracy: 7.0 m 

TIME SPENT IN MINUTES

5 10 15 30 45 60

INFESTATION

Acres Sq Feet

DENSITY


Low Medium High

NOTES

Any additional information

SAVE

Report an Observation

lng: -105.947671  
accuracy: 7.0 m 

TIME SPENT IN MINUTES

5 10 15 30 45 60

INFESTATION

Acres Sq Feet

DENSITY

Low Medium High

NOTES

Any additional information

SAVE

## EDDMapS West



### Species Categories

Report and view species by category



### All Species

Full list of all species available for reporting



### My Species List

Short list of your selected species



### State Species List

List of species by state



### Montana Noxious Weed Key

Identify a species using key descriptors



### Negative Survey

Submit a negative survey report



### Upload Queue

View, edit, or upload your reports

That's it!  
You are  
done!!

# Polygon, Line or Point?

- List A Species:
  - (REQUIRED) Map the gross area with a polygon that encompasses all of the infested areas.
  - (Kayla recommends!) Map occurrences within the polygon with points or lines annually. This will allow you, as a manager, to track the changes in A-list species population occurrences and densities on a year-by-year basis.



Secure | <https://mapitfast.agterra.com/Mapping/Main>

Apps Noxious Weed Reso Plant ID resources Mentzelia Pesticide Calculations Early detection & Ra Herbicide Resources CT Rust Info Supplies and Purcha

**Elongated mustard polygon**

14  
500 m  
2000 ft

Wellsville

Rio Grande Bridge

© AgTerra Technologies, Inc.  
Map data ©2017 Google | Terms of Use

3:14 PM  
10/30/2017

# Polygon, Line or Point?

- List B & C Species:
  - (REQUIRED) map the gross area of the list B species with a point to represent the densest portion of the population.
  - (Kayla Recommends!) IF your program objective is to eradicate the B-list species, include the polygon perimeter of the gross area and map occurrences within the population on yearly basis!

# Canada thistle

*Cirsium arvense* (L.) Scop.

USDA PLANTS Symbol CIAR4  
Invasive Plant Atlas  
Species Information

States Counties **Points** List

CSV KML GPX Shapefile

Zoom to My Location Share Download Flag Fullscreen



# Canada thistle

*Cirsium arvense* (L.) Scop.

USDA PLANTS Symbol CIAR4  
Invasive Plant Atlas  
Species Information

States Counties **Points** List

Revisit | Download Record (pdf)

**Record ID** 4919447

## Location Information

**Habitat** Edge: Trail  
**Locality** Canada thistle is scattered along the sides of the trail leaving the Clear Creek Reservoir campground, mostly near dug drains.  
**Location** Chaffee County, Colorado, United States  
**Coordinates** 39.01560, -106.28036  
**National Ownership** Federal Lands

## Infestation Information

**Infested Area** 1.19 acres  
**Infestation Status** Positive

## Reporter Information

**Reporter** Alix Jensen, FS  
**Observation Date** June 10, 2017  
**Date Entered** July 26, 2017  
**Source Type** Web Report

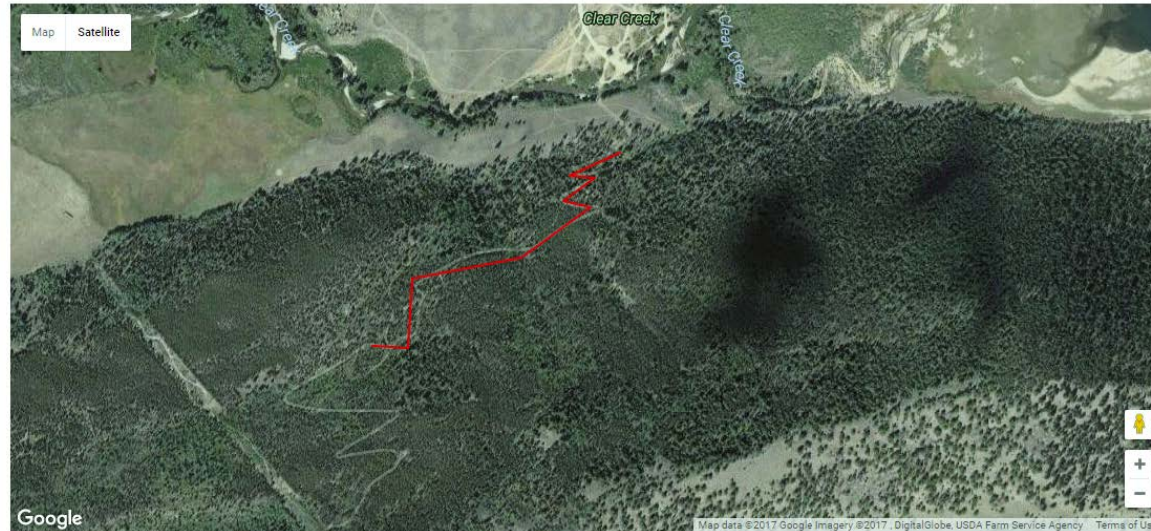
## Species Information

**Phenology** Sapling/Immature/Seedling/Rosette

## Verification and Review

Noxious Weed Resou. Plant ID resources Mentzelia Pesticide Calculations Early detection & Ra Herbicide Resources CI Rust Info Supplies and Purcha Login - Ag Terra Tech  
Datum WGS84

## Other



Google

Map data © 2017 Google Imagery © 2017, DigitalGlobe, USDA Farm Service Agency Terms of Use

# Plant Life Cycles

- Annual – Plant germinates, matures, flowers, and produces seed in a single year.
- Biennial - Plant germinates, grows for a year (generally in a rosette form), overwinters, then matures, flowers, and sets seeds in the second growing season, then dies.



Puncturevine



Houndstoung



Bull Thistle

# Annuals & Biennials

- Quick Life Cycles.
- Depends on seed production.

MANAGEMENT GOAL: Stop seed production.

- A single treatment (in general) will kill existing plants.
- Needs to be repeated on newly germinated seedlings.

MAPPING FOR MANAGEMENT:

- Track-lines can be used to designate negative survey results.
- Record the species distribution within the infested area annually.
- Point data for each individual plant is ineffective due to their mobility

# Plant Life Cycles

- Perennials – Plant germinates and grows. Individual plants may or may not set seed during first year of growth. Does not die back after maturing, flowering, and producing seeds.



Field Bindweed



Diffuse Knapweed



Yellow  
Toadflax



Hoary Cress

# Perennial Life Cycles

- Simple Perennials – reproduces and spreads by seed only. Most have taproots.



Spotted  
Knapweed



Dandelion



Broadleaf  
Plantain

- Creeping perennials – reproduce from root fragments, runners, rhizomes, or stolon as well as by seeds.



Canada  
Thistle



Dalmatian  
Toadflax



Leafy Spurge

# Perennials

- Multiple-year life cycles.
- Rhizotomous plants do not require seeds for dispersal.

MANAGEMENT GOAL: Stop seed production and kill existing plants.

- Multiple herbicide/mechanical treatments can be necessary in order to kill a single individual plant.
- Intensive surveys to detect regrowth are necessary.

MAPPING FOR MANAGEMENT:

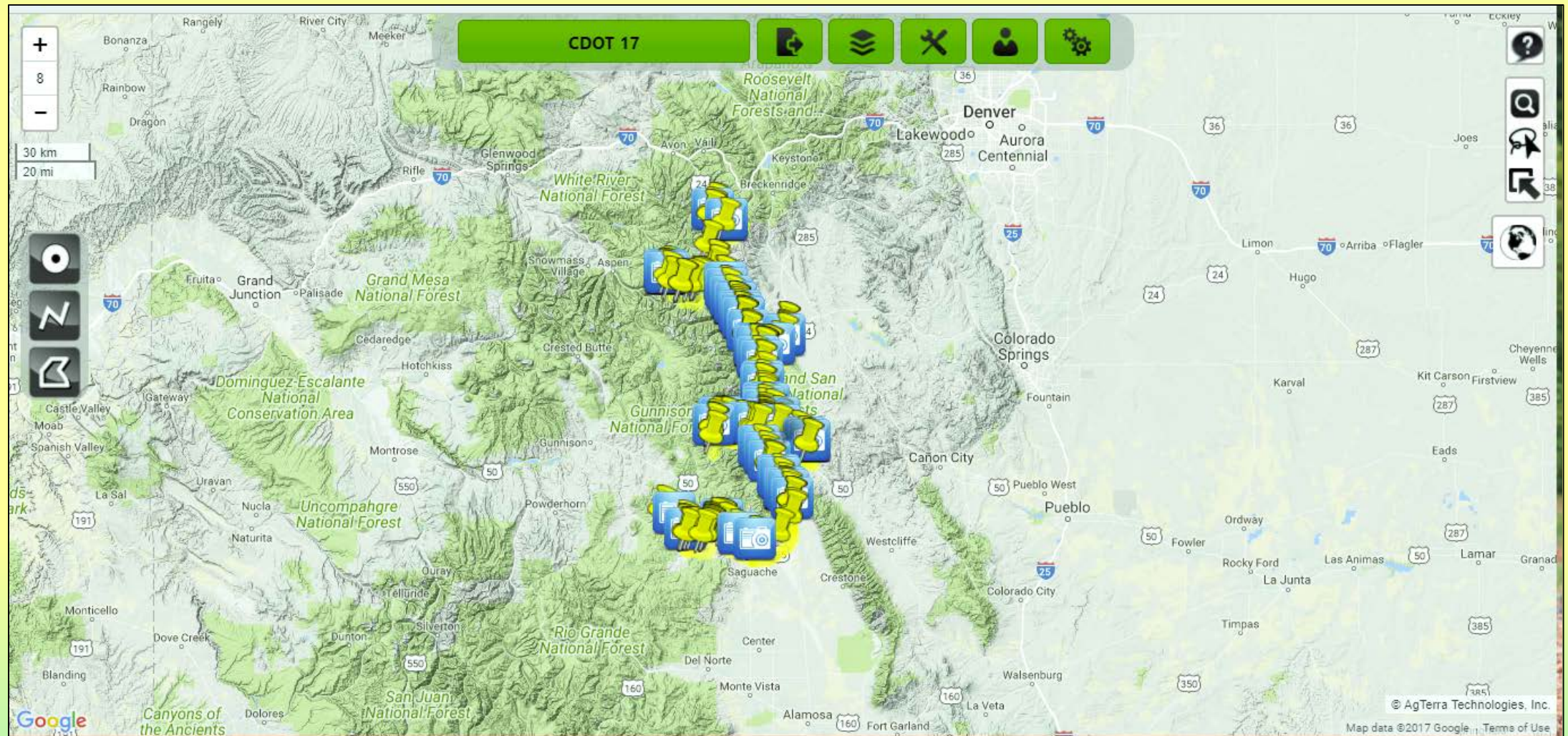
- Use track lines to record all negative surveys. Update existing point data to reflect treatment efforts.
- Use points to record the location of every individual plant.



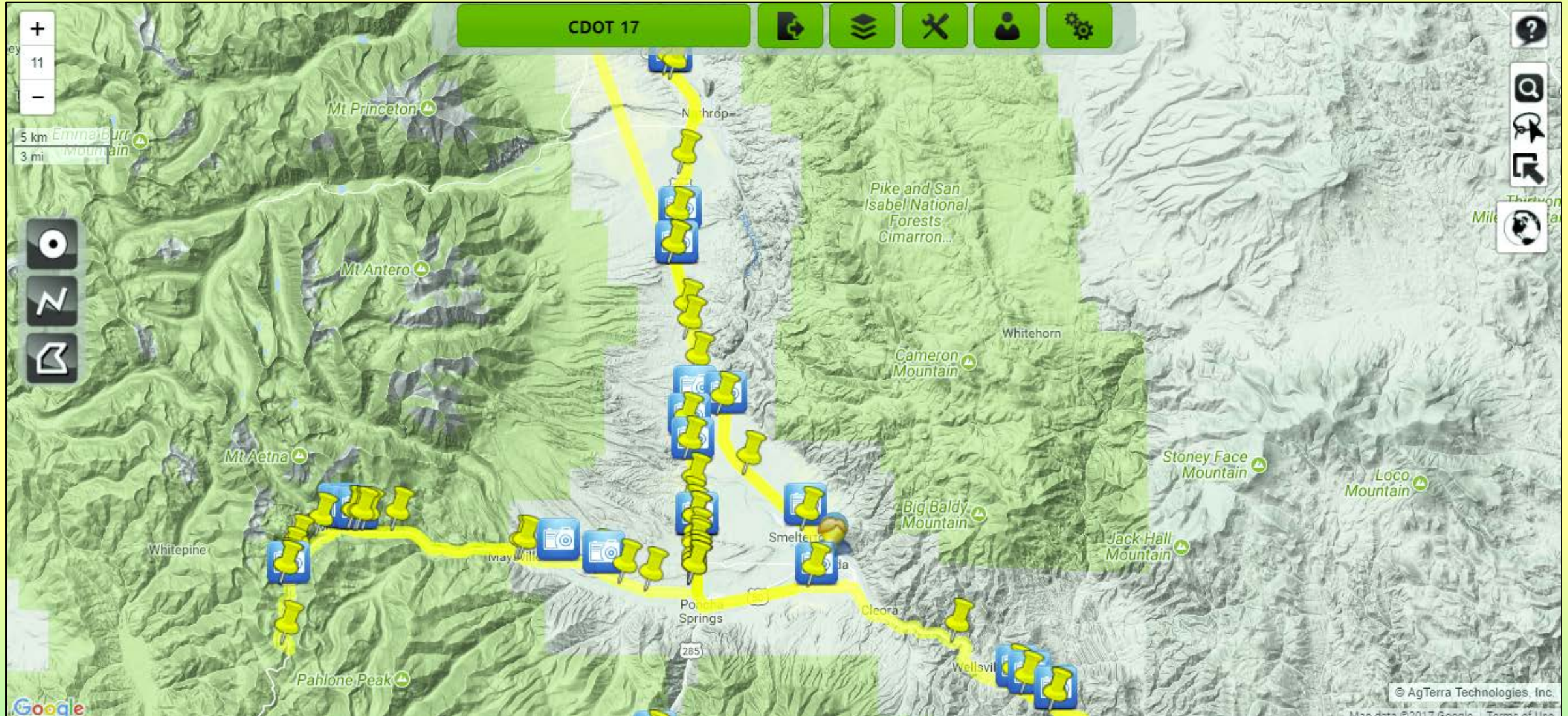
# Mapping Strategies

- Chaffee County – uses track lines to designate all activities; all detected plants are treated at the time of detection.
- Record mapping data based on the land use objectives:
  - Common annuals and biennials on roadways in single plant populations – will not map.
  - Annuals and biennials on roadway in monoculture stands (more than 5 plants in a grouping) – will map.
  - A single rhizotomous perennial on a roadway out of containment – will map.
  - A single simple perennial on a roadway – will map if objective is to eradicate, will not map if within designated suppression.
  - A population with multiple perennials in a stand – will map regardless of objective status.

# CDOT Mapping

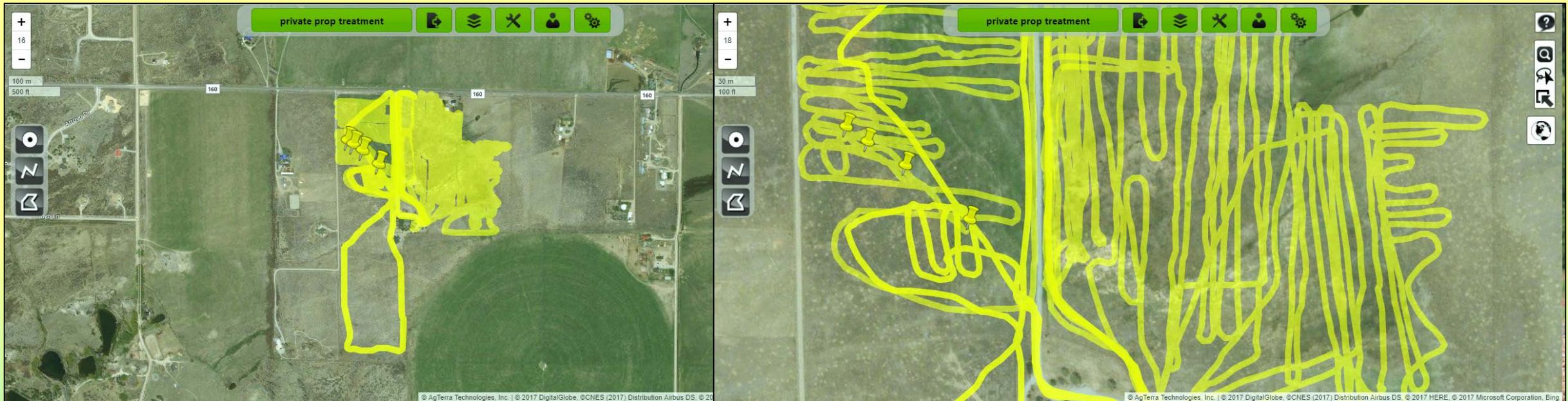


# CDOT 17



# Private Property Treatment

- Objective: Suppress Canada thistle to reduce forage loss for grazing on private property.
- Need to know:
  - What physical areas were surveyed and treated?



# Management Objectives

- Eradication – reducing a noxious weed reproductive success to zero. Permanent elimination.
- Elimination – Removal or destruction of all emerged, growing plants of a population.

The objective is to completely remove the noxious weed and all viable materials from the managed areas.



# Data

- In order to successfully eliminate a target, you need to:
  - Remove all viable material prior to reproduction.
  - Repeat survey, detection, and treatment efforts annually for at least as long as the known seedbed.
- You need to know:
  - Expected seedbank life of the targeted noxious weed.
  - Maximum region the noxious weed had previously infested prior to control efforts.
  - The individual locations within a site that the weed has been identified.
  - Dates of survey and detection efforts.

# Determine what Data is needed (EX 1)

Treat weed populations.

- No mapping data beyond state-requirements to meet objective.
- Record location information.

**Re-treat weed populations.**

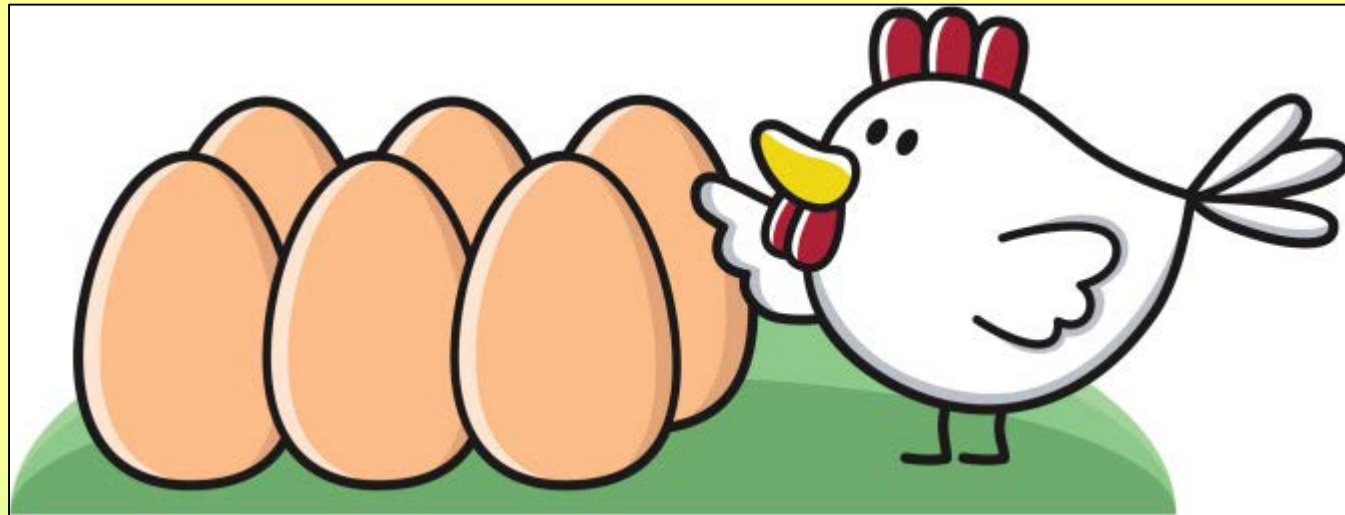
- Need to know where treatment has been conducted before.
- Record location and treatment information.

**Re-treat known weed populations **annually.****

- Need to know all previously known weed populations.
- Need to know where previous treatments have been conducted.
- Need to track treatments for populations on an annual basis.

# Mapping is DATA

- If you have established mapping procedures, review them to see if they fit your objectives.
- If you have established objectives, review them to see how mapping procedure fits.



**MAKE MAPPING A MANAGEMENT OBJECTIVE!**