EDRR Jumpstart: Drinking from a fire hose edition

PLEASE TAKE THE FIRST POLL AS YOU JOIN.

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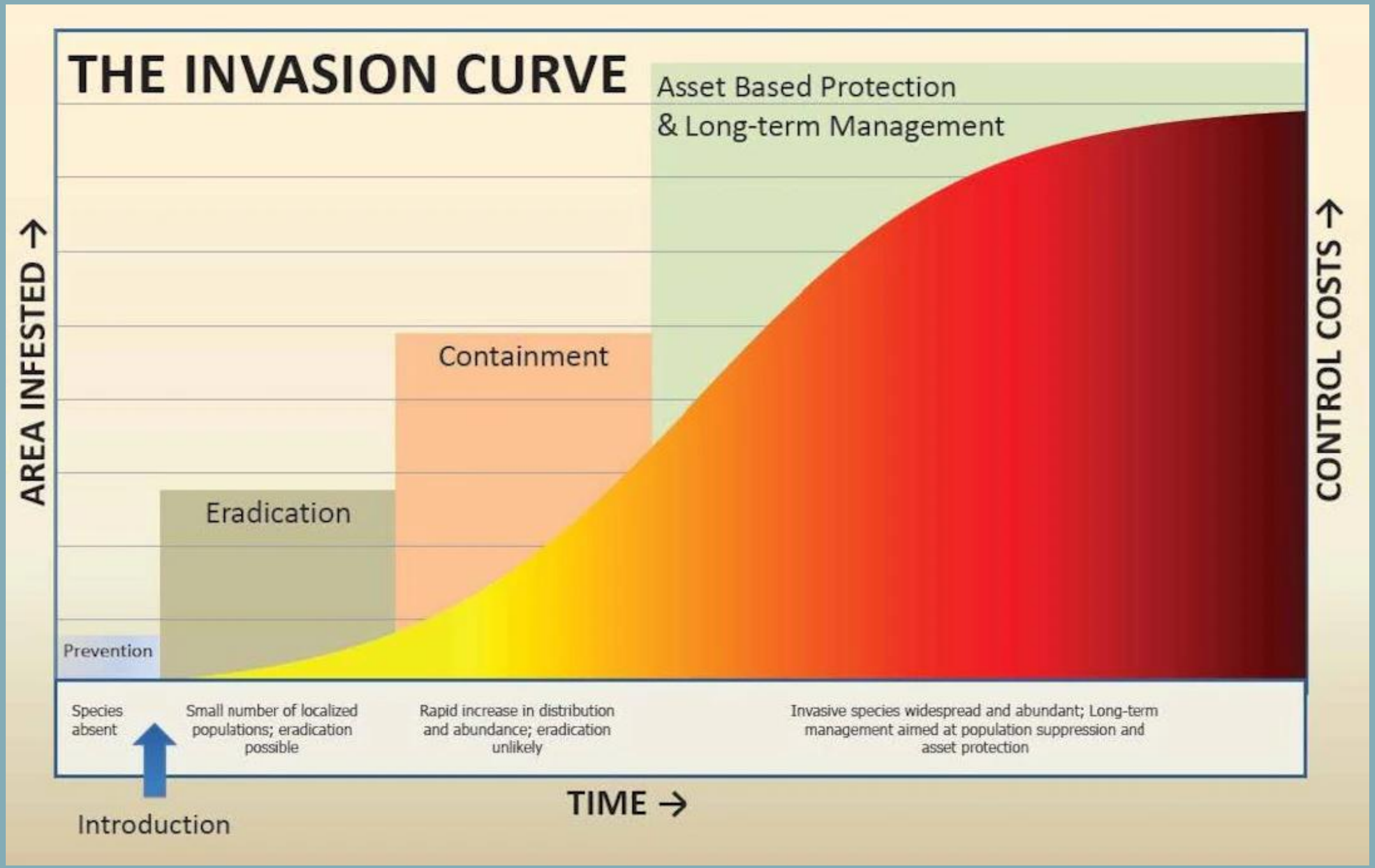
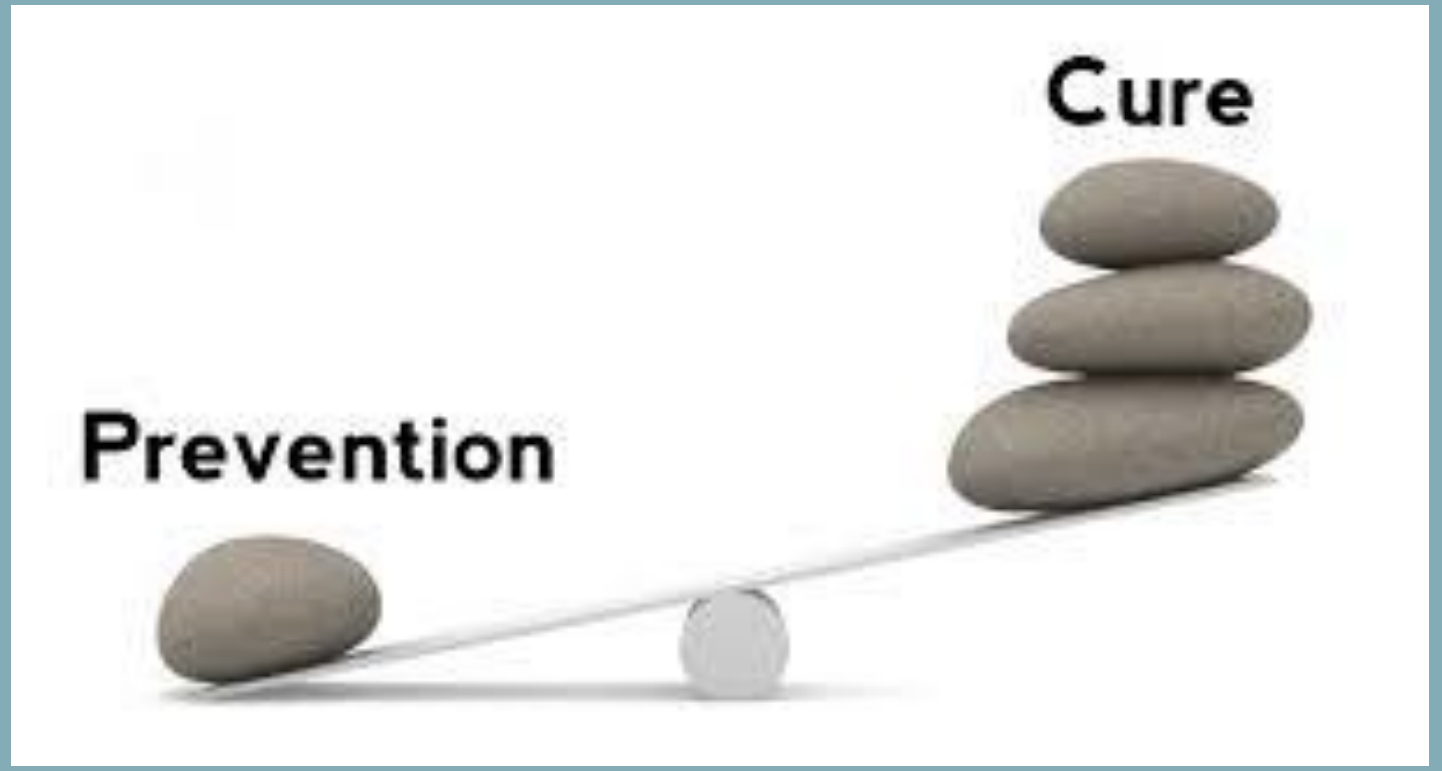
You Can Do This!

- Emphasis on steps to create pilot
- Lots of take home resources
  - Including a whole handbook
- Ask your questions


THE INVASION CURVE
Asset Based Protection
& Long-term Management
Containment
Eradication
Prevention
AREA INFESTED →
CONTROL COSTS →
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and asset protection
Introduction
TIME →

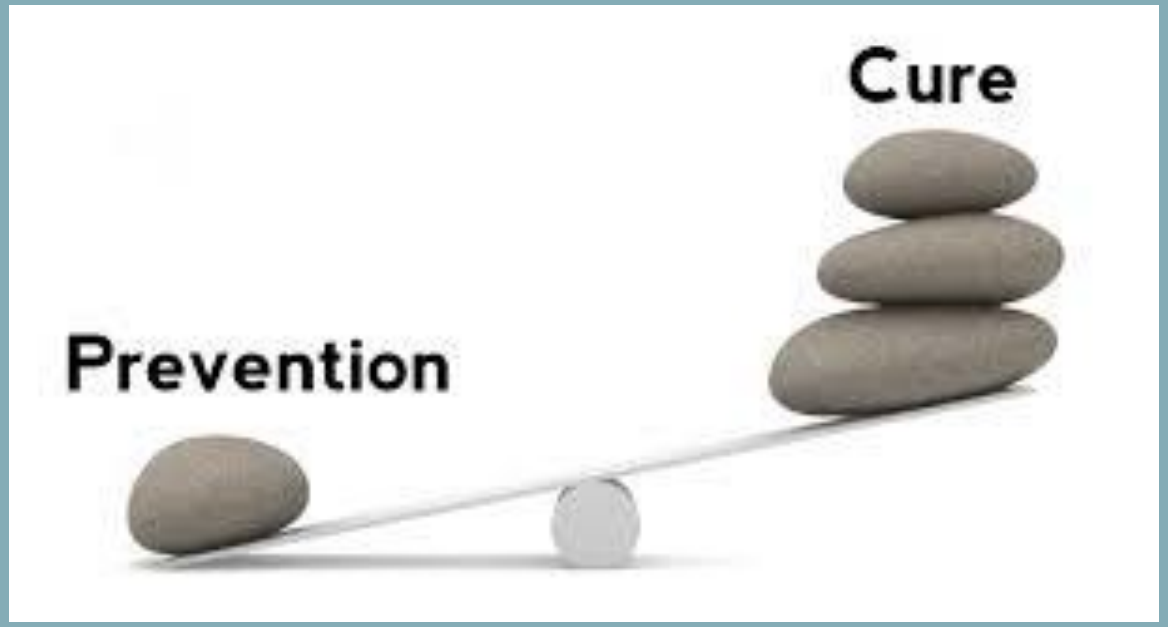
Quiz alert

EDRR identifies and removes isolated populations of weeds before they spread



Benefits of EDRR

- Treatment before weed is widespread
- Reduction in labor effort, (potentially) herbicides, treatment disturbance over time
- Cost effective
- Prevents wider spread impacts to ecosystems



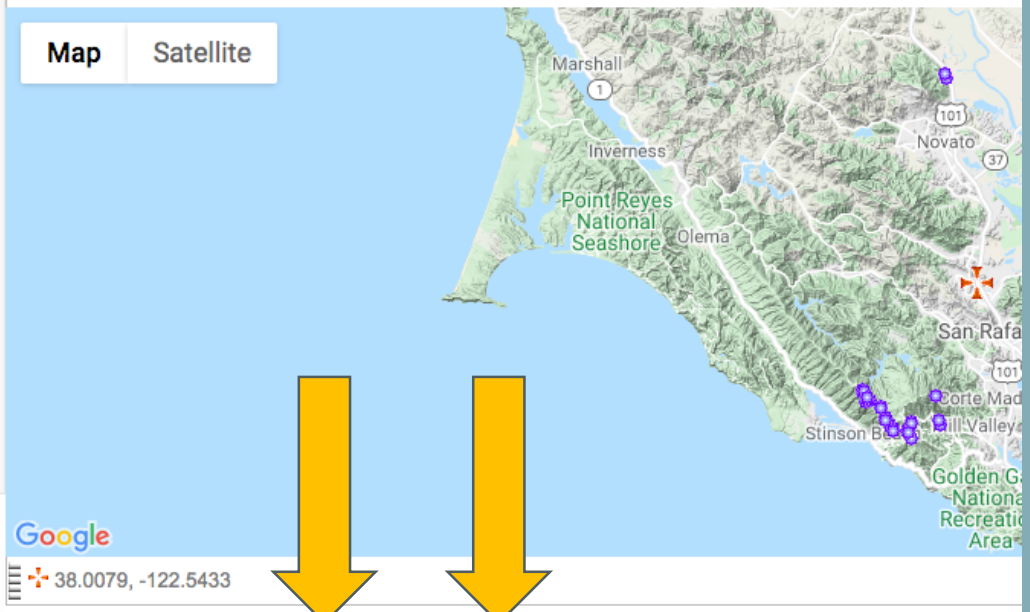
EDRR Works!

Some EDRR successes on Tam!
Purple Starthistle

Calflora Group Observations ▶ TOOLS ▼ MAP

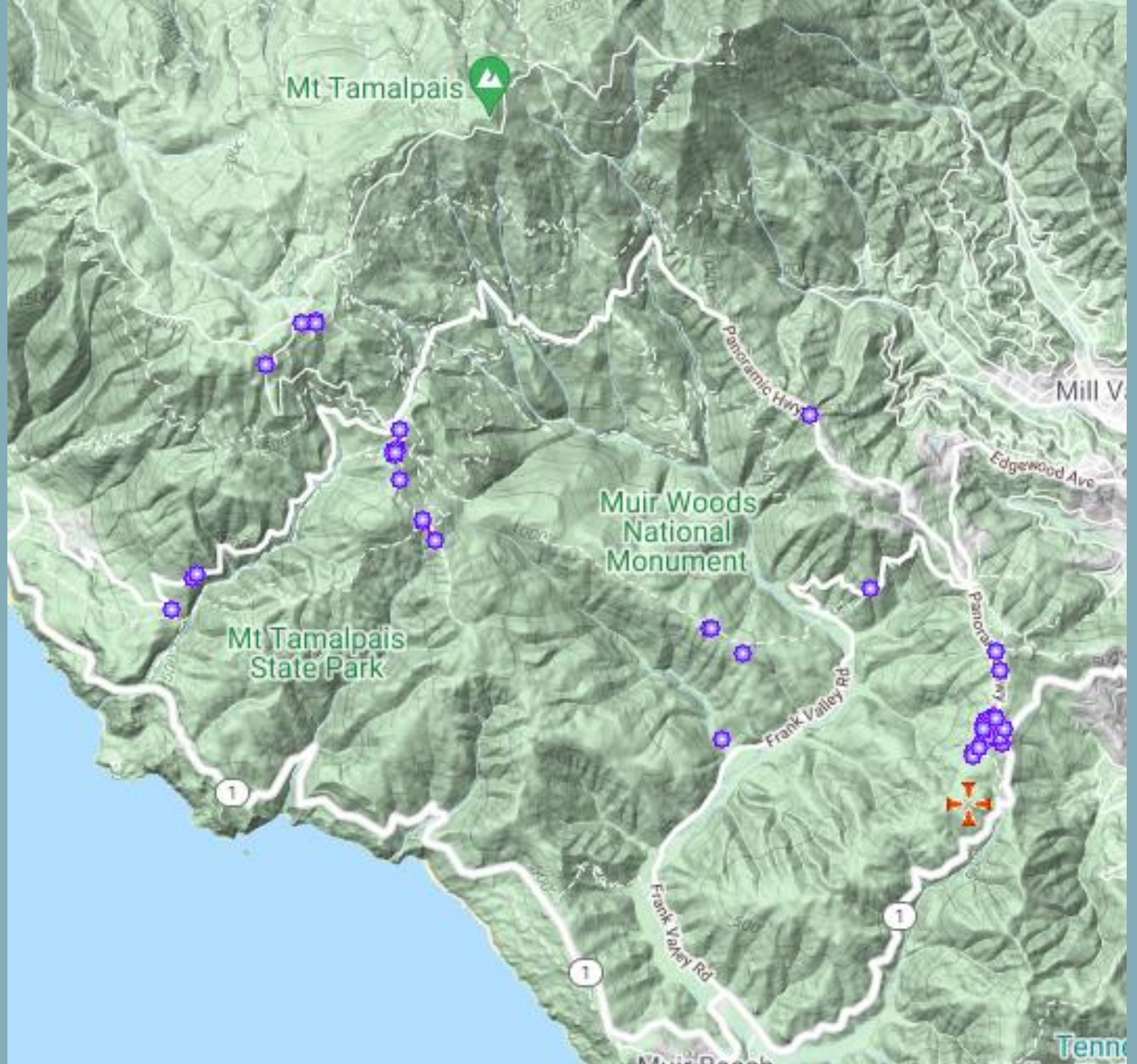
Scientific Name: Centaurea calcitrapa
Common Name: Purple star thistle
Start Date eg. 2021-12-31:
End Date:
anywhere / in map area
Native Status: any
Plant List: none
▶ POLYGON
Geometry: any
Group: Mount Tamalpais State Park (view)
Treatment: any
▶ Projects
History: All records
▶ More Criteria
only my records
Column Set: custom
▶ Customize
SEARCH
134 records.

▶ SYMBOLOGY



ID	Observer	Taxon	Common Name	Radius (meters)	Location Description	Region	Number of Plants	Under Management?	Date / Time	Treatment?	Mechanical Method
mg139749	Michael Sturtevant	Centaurea calcitrapa	Purple star thistle	.6	Ridgecrest	Bolinas Ridge	0	not found	2021-06-15 11:30:43.0		
mg139776	David Greenberger	Centaurea calcitrapa	Purple star thistle			Bolinas Ridge	0	not found	2021-06-15 10:37:04.0		
mg139746	Michael Sturtevant	Centaurea calcitrapa	Purple star thistle	.6	Ridgecrest Blvd, pullout by McKennan Trailhead.	RIDGECREST BREAK	0	not found	2021-06-15 10:04:49.0		
mg139775	David Greenberger	Centaurea calcitrapa	Purple star thistle	.6	Ridgecrest Blvd	Bolinas Ridge	0	not found	2021-06-15 09:58:27.0		
mg139745	Michael Sturtevant	Centaurea calcitrapa	Purple star thistle	1.5	W Ridgecrest Blvd	RIDGECREST BREAK	0	not found	2021-06-15 09:57:23.0		
mg139774	David Greenberger	Centaurea calcitrapa	Purple star thistle	1.5	W Ridgecrest Blvd	Bolinas Ridge	0	not found	2021-06-15 09:57:00.0		
mg139744	Michael Sturtevant	Centaurea calcitrapa	Purple star thistle	.6	RIDGECREST	RIDGECREST BREAK	0	not found	2021-06-15 09:48:50.0		
mg139743	Michael	Centaurea	Purple star	.6	Ridgecrest Blvd, pullout near northern	RIDGECREST	0	not found	2021-06-15		

Some EDRR successes on Tam!
Stinkwort


Mt Tamalpais
Muir Woods
National
Monument
Mt Tamalpais
State Park
Panoramic Hwy
Edgewood Ave
Frank Valley Rd
Frank Valley Rd
1
1
1

Survey Geography

Real World EDRR

In an ideal world we'd walk every inch of a park to look for weeds.

But this isn't realistic.

EDRR is typically a sample of potential invasive plant areas based on our understanding of weeds and our lands.

KEEP
CALM
AND
PRIORITIZE

Prioritization Frameworks

Best and Worst First Approach

Choose most impacted areas and your most valuable habitats/sites

Disturbance areas

- fire
- construction
- fuels reduction

Rankings by Management Unit/Subwatershed

Rank Management Units or subwatersheds and cycle through based on ranking.

Prioritization Frameworks

Disturbance Only

- fire
- construction
- fuels reduction
- utility maintenance

This puts emphasis on areas of likely weed invasion irrespective of resource value.

Prioritization Frameworks

Ranking by Management Unit/Subwatershed

You can learn more about this approach in the San Francisco Bay Area Network Inventorying and Montitoring Program EDRR protocol found here:

https://irma.nps.gov/DataStore/DownloadFile/460898

Survey Features

What exactly are we looking at?

Be realistic.

Think disturbance.

Roads and Trails

- Roads
- Trails
- Roadside pullouts
- Pick up trailheads and parking lots as you do a trail.
- Pick up infrastructure and visitor use areas along the route.

Visitor Use Areas

- Campgrounds
- Parking lots
- Stables
- What else ya got? Throw it in the chat!

Infrastructure

- Water tanks
- Maintenance yards
- Greenwaste depots
- Materials depots
- Livestock congregation areas

Riparian Corridors

- Creeks
- Drainages
- Rivers

These features take much longer to survey.

Disturbance Areas

- New Construction Areas
  - Survey before if you have time for weeds that may be moved around
  - Survey in years 1 and 2 post construction
- Wildfire Areas
  - Handlines
  - Dozer lines
  - Staging areas
- Fuels Reduction Areas
  - Utility lines

Sensitive/High Value Features

- Rare Plant Areas
- Restoration Sites
- Sensitive Wildlife Habitat
- Seeps and Springs
- Others?

Aquatic Sites

Ask yourself:

Do I have a boat?

Do I have a treatment method?

Prioritization Frameworks

Best and/or Worst First Approach

Choose your most valuable habitats/sites and/or your most impacted areas.

Allows you to capture areas where weed invasion would be highly impactful and/or where weed invasion is most likely.

This can be subjective or integrated into a ranking system like the management unit approach in which high invasion potential and high resource values are given the strongest scores.

Steps for Your Pilot

1) Select a Prioritization Framework

   Select park units/areas to survey

2) Select features to survey

3) Create a survey schedule for pilot season

   Consider timing for dominant habitat types and likely species for a given area.

Helpful Place to Start

Park Unit	Acres	Miles of Rd & Trl
Ajumawi	6507	20
Anderson Marsh	1065	7.5
Bidwell Mansion	5	
Bidwell Sac River	295	7
Placerita Canyon	356	.4
Castle Crags	3,728	28
Clear Lake	583	6
Colusa Sac River	357	1
Lake Oroville	29,122	63
McArthur Burney Falls	885	5
Sutter Buttes	1785	6
Woodson Bridge	362	2
William Ide B. Adobe	6	0.2
Shasta	24	.2
Total	**45,080**	**146**

Survey Geography Q&A

Species List

Species List

This section includes

- A review of list examples and sources
- Criteria for creating a list

Species List – One Tam Example

PRIORITY ONE

Species	CDFA Rating	Cal-IPC Rating
Aegilops triuncialis	-	High
Ailanthus altissima	C	Moderate
Albizia lophantha	-	-
Arctotheca calendula	A	Moderate
Brachypodium sylvaticum	-	Moderate
Bromus tectorum	C	High

PRIORITY TWO

Species	CDFA Rating	Cal-IPC Rating
Acacia melanoxylon	-	Limited
Ageratina adenophora	-	Moderate
Arctotheca prostrata	-	Moderate
Calendula arvensis	-	-

One Tam Example
Six undetected species and why we keep looking

Keep in mind

- Early detection species are infrequent.
- You have an opportunity to map widespread weed species
  - This significantly increases survey time

Starting Points for Species List

- Cal WeedMapper
- Cal IPC Regional EDRR Targets
- WMAs
- Adjacent land managers
- Cal IPC Annual Weed Alerts

CAL IPC CALWEEDMAPPER

Let's look at some tools!

Potential Species List Criteria

- Impact
- New to the area or in low distribution
- Known to be invasive
  - Or related species performing similarly
- Treatment feasibility
- Terrestrial only
- Detectability
- Trainability

Vetting long lists of potential targets

Use your selection criteria

Pay special attention to

- Habitat suitability on your land
- Proximity – likelihood of introduction
- Treatment feasibility
- Impact

T219 | CalWeedMapper: Euphorbia lathyris

	A	B	C	D	E	F	G
1	SPECIES ID	OPPORTUNITY	CALIPC RATING	CDFA RATING	BAEDN RATING	FAMILY	SPECIES
2	104	surveillance	High	B	2010 BAEDN	Poaceae	Aegilops triuncialis
3	49	surveillance	High	A		Amaranthaceae	Alternanthera philoxeroides
4	50	surveillance	High			Poaceae	Ammophila arenaria
5	59	surveillance	High			Aizoaceae	Carpobrotus edulis
6	66	surveillance	High	B		Asteraceae	Delairea odorata
7	67	surveillance	High	C		Hydrocharitaceae	Egeria densa
8	68	surveillance	High			Poaceae	Ehrharta calycina
9	71	surveillance	High	NR		Pontederiaceae	Eichhornia crassipes
10	73	surveillance	High	A	2010 BAEDN	Euphorbiaceae	Euphorbia virgata (= Euphorbia esula)
11	83	surveillance	High	C		Onagraceae	Ludwigia hexapetala and L. peploides
12	86	surveillance	High	B	2010 BAEDN	Lythraceae	Lythrum salicaria

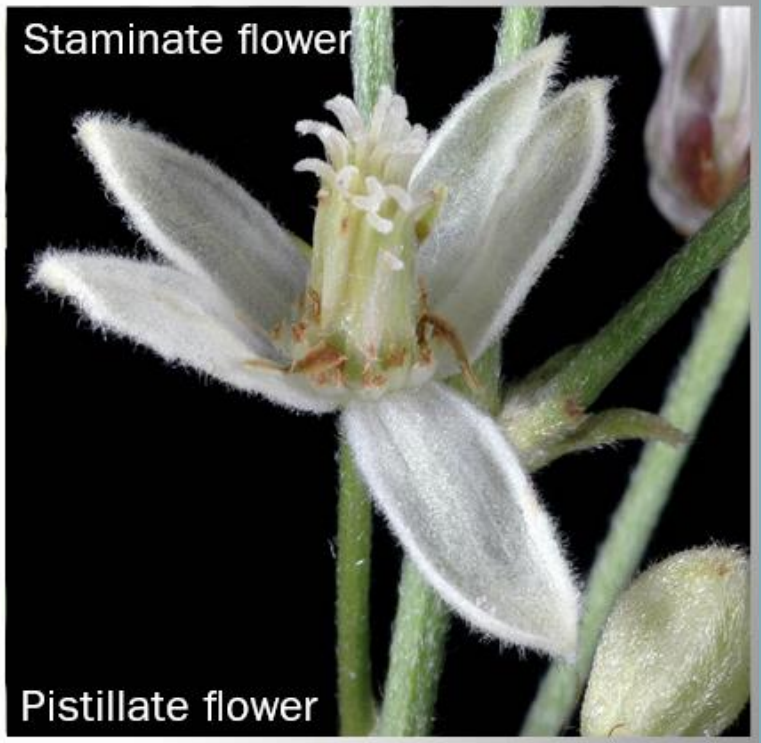
Annual Grasses and Thistles/Asters

Training Training Training

Old Man's Beard
Clematis vitalba

- Bisexual flowers
- Flowers in spring

Western Clematis
Clematis ligusticifolia



- Unisexual flowers; dioecious
- Flowers in summer

Create Field Resources

Acacia melanoxylon **Blackwood Acacia** • Priority 2 • Fabaceae (Pea Family) • Tree • Flowers in balls • Mature leaves simple; young leaves pinnately compound with leaf-like phyllode at base		
Aegilops triuncialis **Barbed Goatgrass** • Priority 1 • Poaceae (Grass Family) • Annual grass • Short-hairy leaves and stems • Awns stiff, rough-textured		
Ageratina adenophora **Thoroughwort** • Priority 2 • Asteraceae (Sunflower Family) • Perennial herb • Prefers moist habitats		
Ailanthus altissima **Tree of Heaven** • Priority 1 • Simaroubaceae • Tree • Smells of rotten peanut butter when leaves/stems broken		

Living List

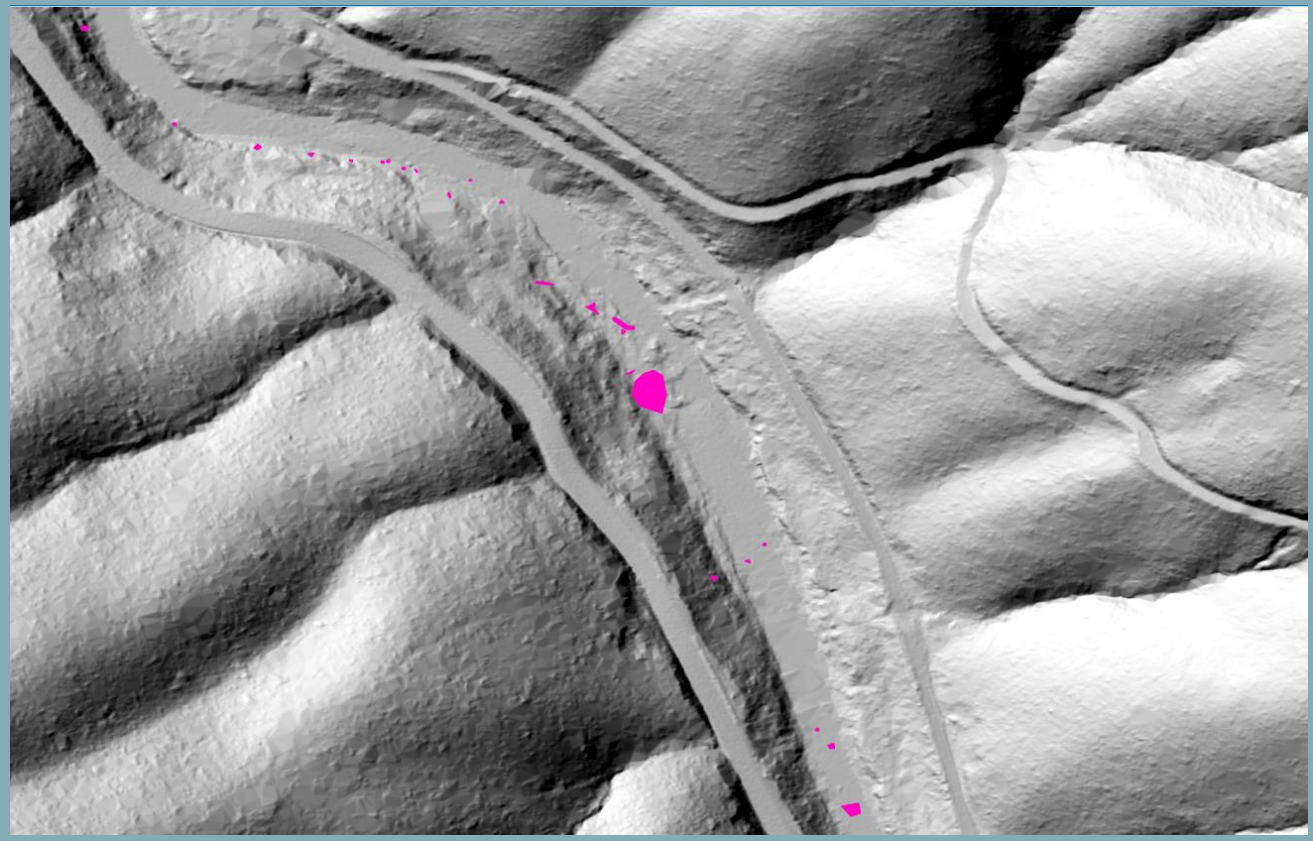
- Review your list regularly – annually to every three years.
- Be prepared to add new threats.
  - But don't explode your list…
- Don't hesitate to drop species that are prove too widespread for management.
  - One Tam Brachypodium distachyon example

Species Lists Q&A

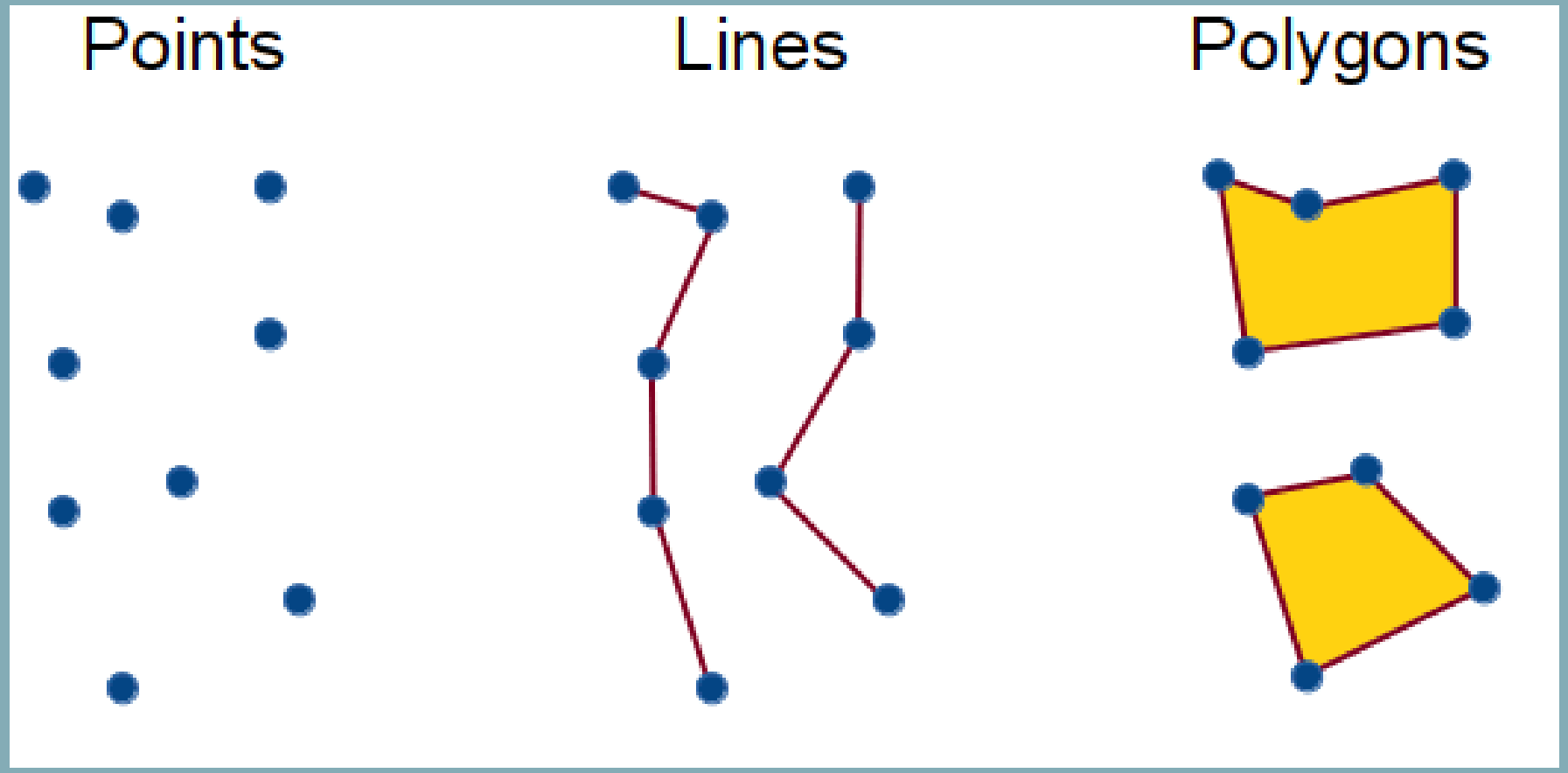
Data Management:
Strategies, tradeoffs, and pitfalls

Field Data Collection – Occurrences and Treatments

Geospatial occurrence and treatment data in the form of points, lines, and polygons with attributes.



Protocol Options – Geometry Type



Points Vs Polygons: Calculating Area

Gross Area is a critical attribute of weed occurrence and treatment data.

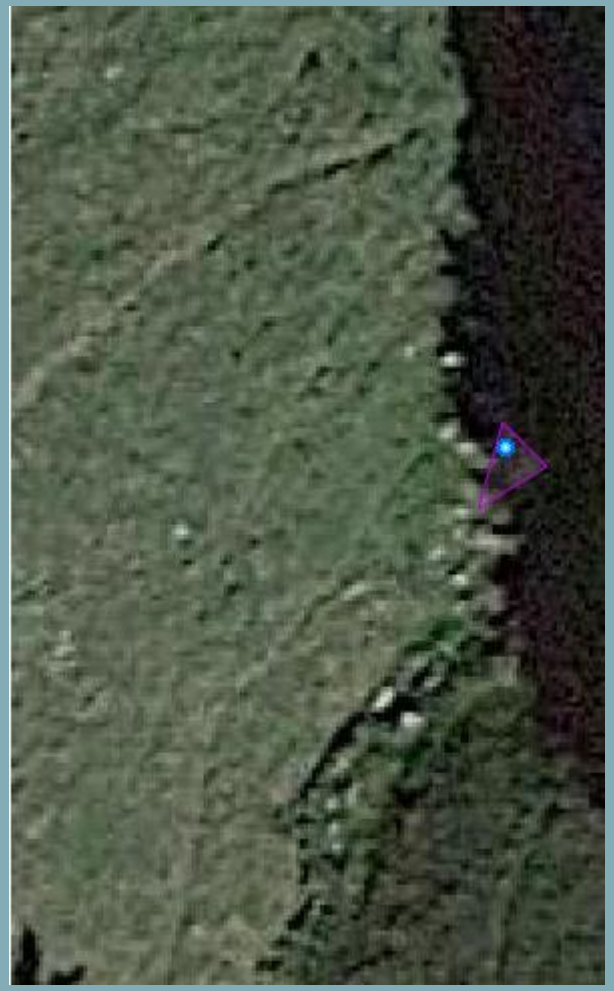
Infested Area is calculated by multiplying Gross Area x % Cover

- Can also be thought of as area a weed actually covers (net area)

Polygons: GIS will calculate gross area for you.

Points or Lines: You must estimate a radius or buffer distance to generate gross area in post processing.

Geometry Type: A note on digitizing on mobile devices



Points Vs Polygons: My Take

Use them all for their best purposes.

Post process to a polygon layer. Make that the data you take back out into the field next season.

Or start with either points or polygons in your pilot and adjust as needed down the road.

Take gross area somehow!

Protocol Best Practices

Inter-patch distance = 20m

Minimum mapping unit =1m

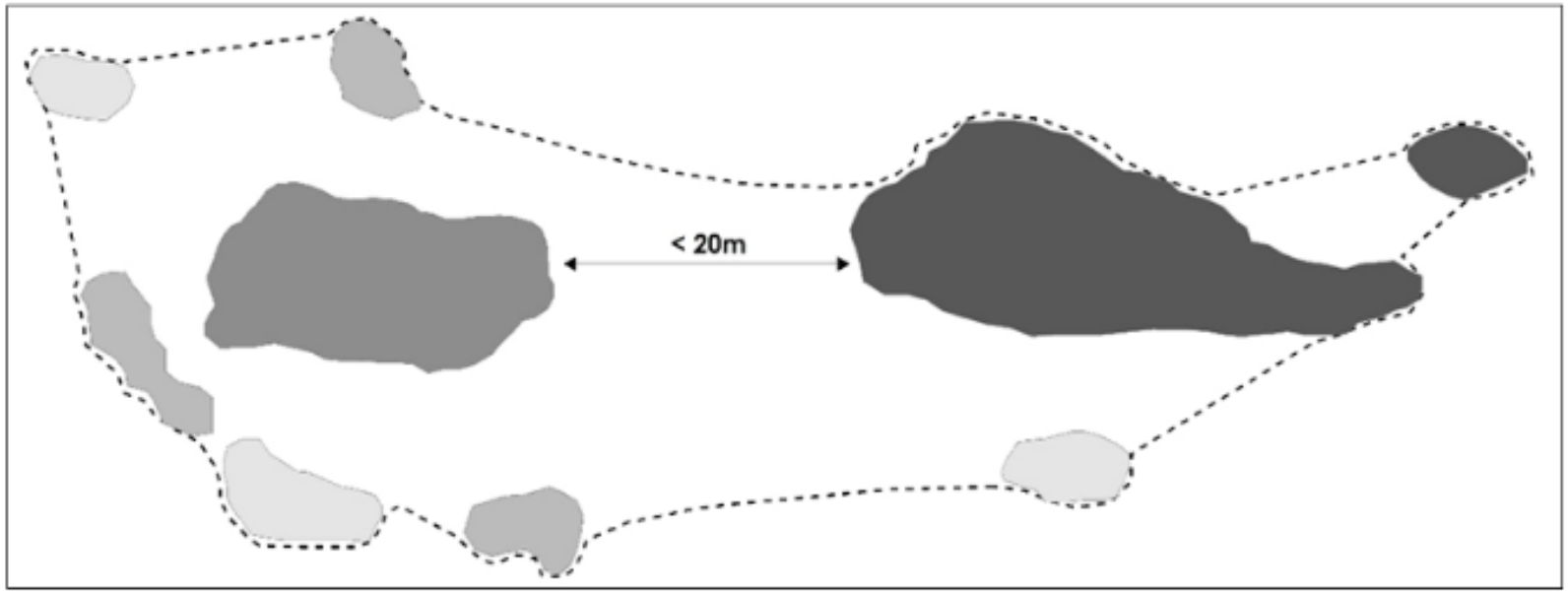


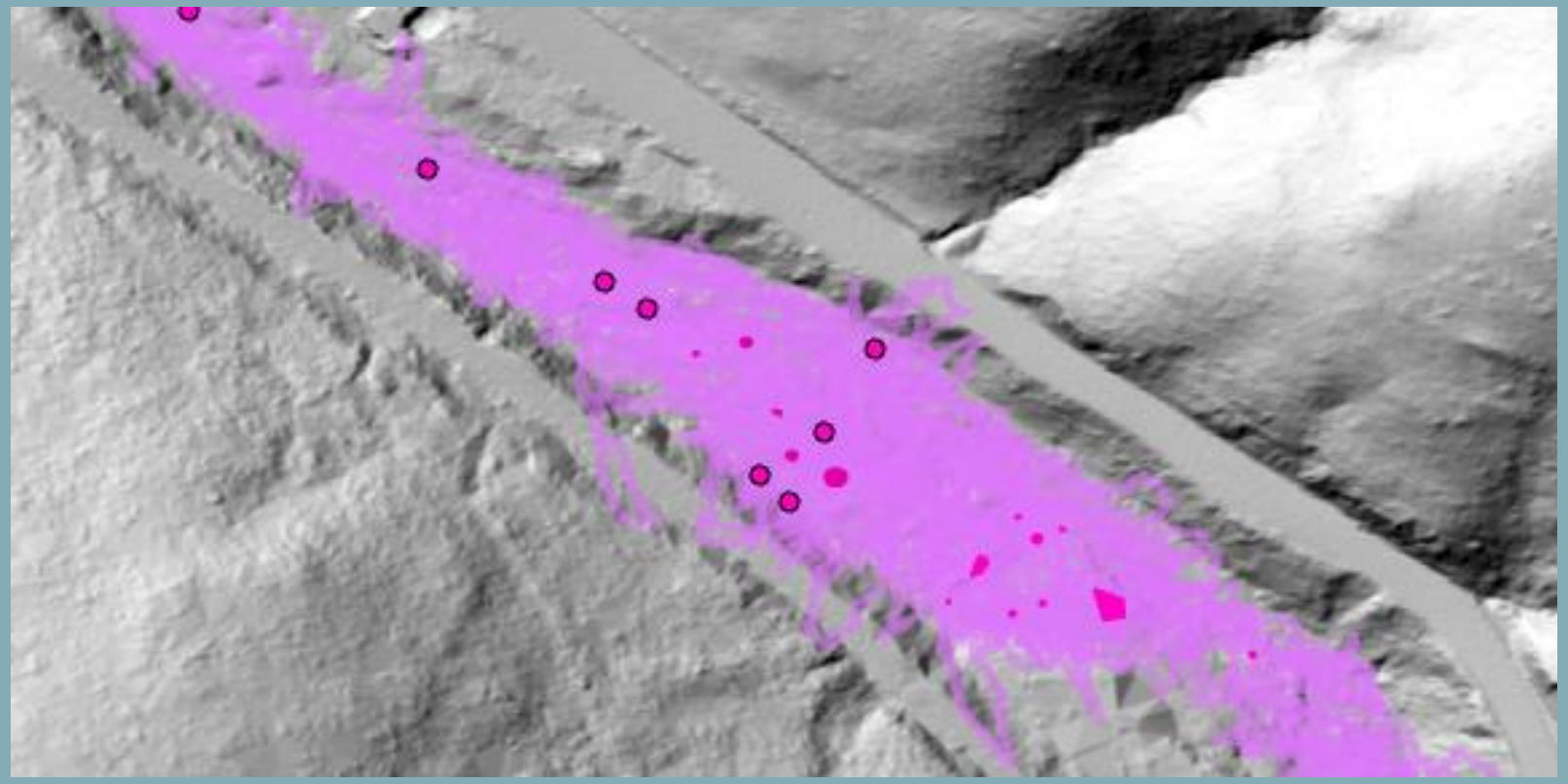
Figure 5. Patches of the same species within 20 meters of each other are mapped together as a single polygon (dotted line), despite differences in density. Adapted from Williams et al. 2009.

Data Management Top Tips

- Upload survey data ASAP
- QC data within a week or two
- Once a quarter, have someone other than the surveyor QC the data and point out any gaps. Do this again before any seasonal staff leave.

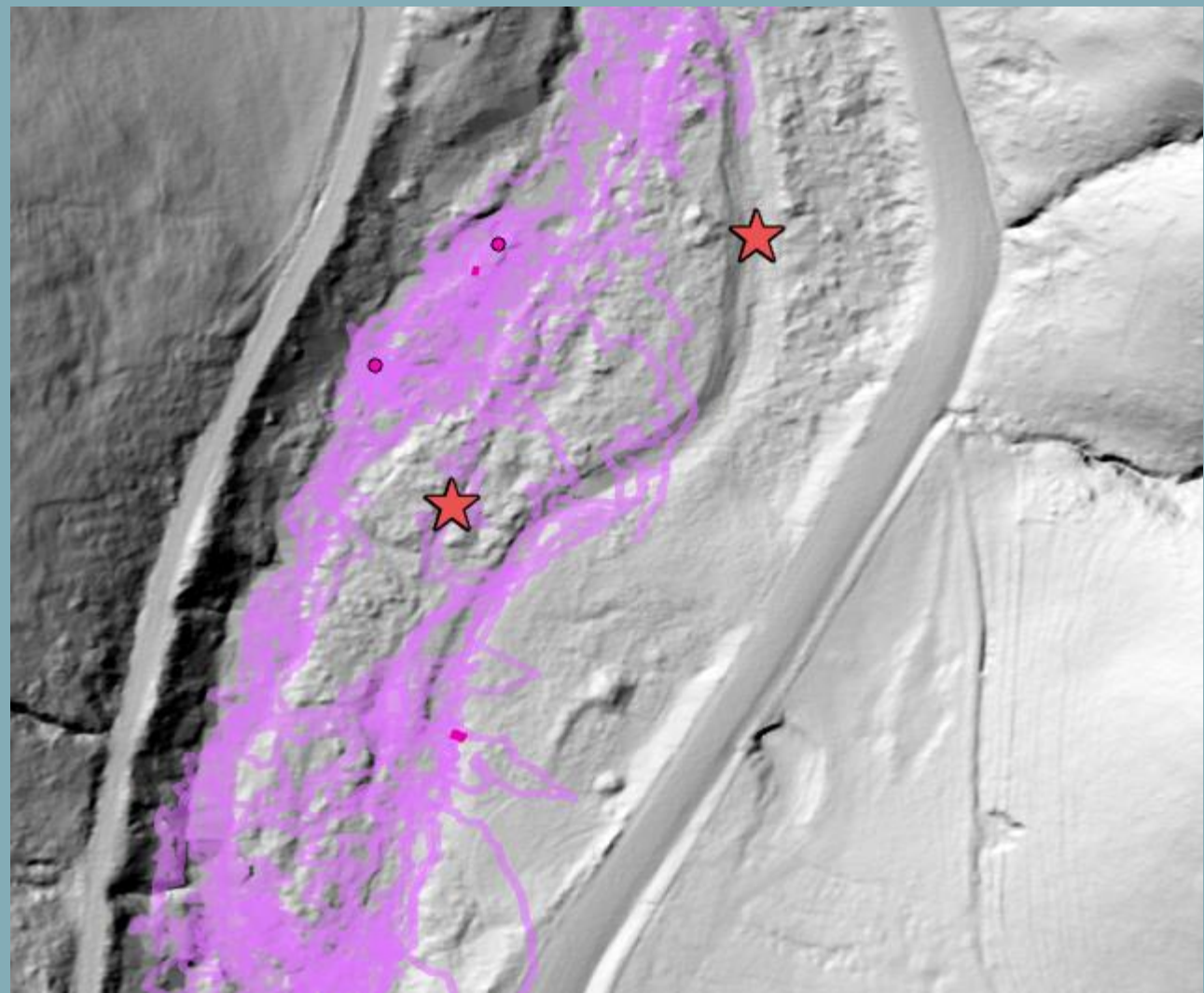
Tracklogs are awesome…sometimes I cheat

Tracklogs in non-traditional surveys



Tracklogs in non-traditional surveys

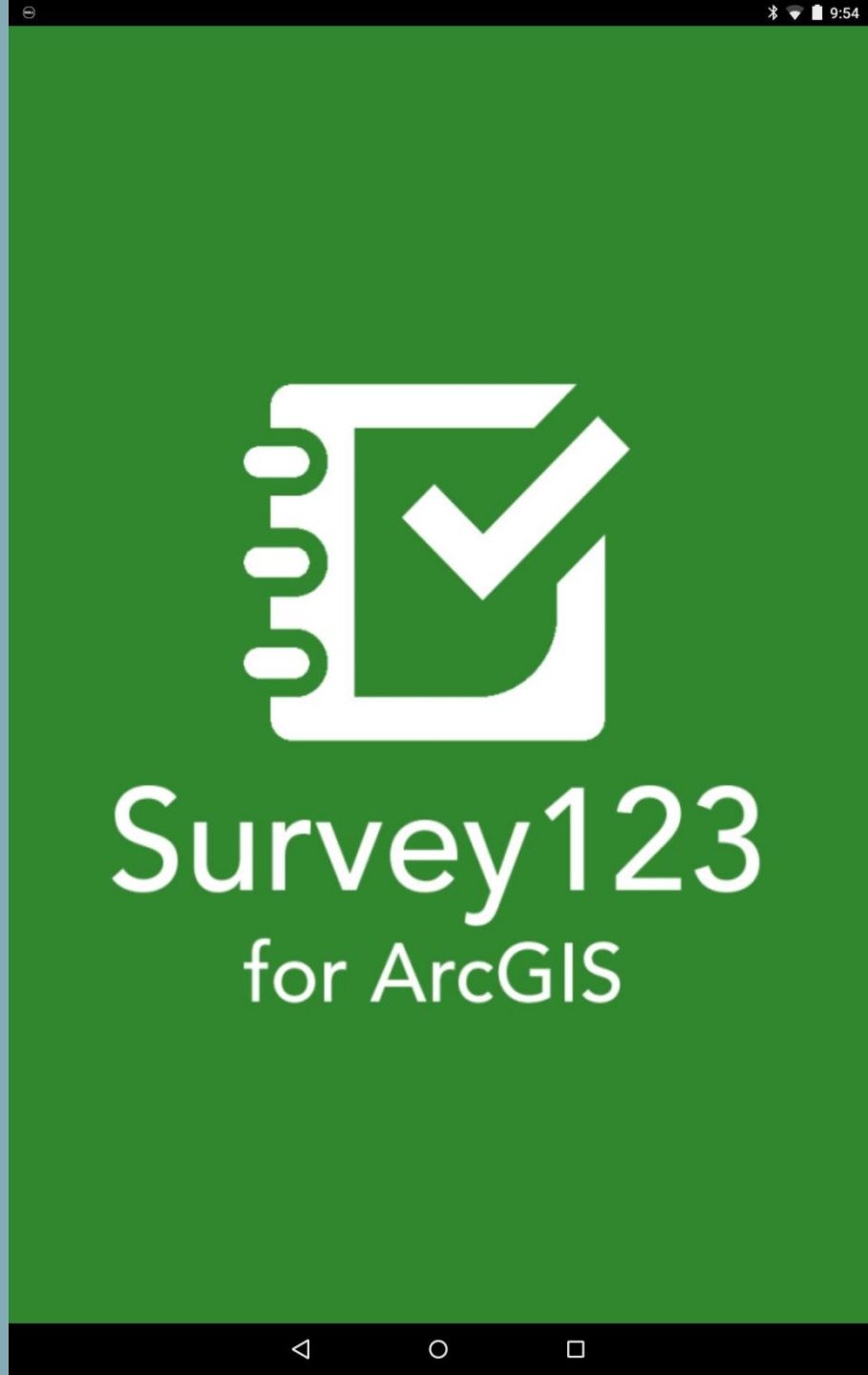
- Floodplain widens dramatically.
- Used tracklogs to find gaps in survey coverage
- Used Lidar to identify low lines and side channels that we can't find in the field because of the vegetation matrix
- Now we know where we might need to cut access lines in the non-breeding season for summer surveys.



Software: ESRI

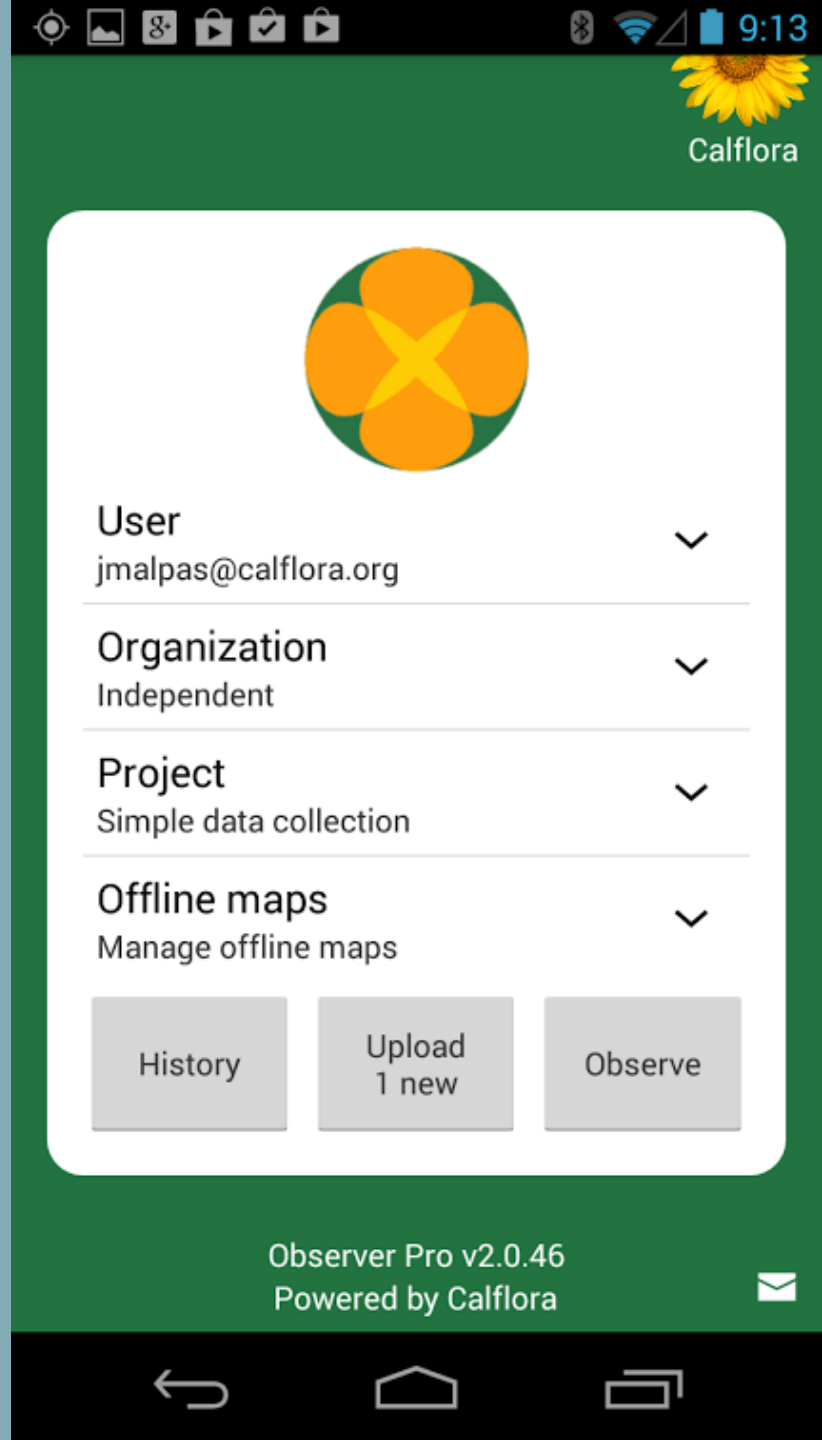
Features	Survey123	FieldMaps
Lines	Yes	Yes
Polygons	Yes	Yes
Tracklogs	No	Yes
Requires AGOL Login	Yes	No

Survey 123 only supports one layer at a time whereas FieldMaps supports multiple layers.



Software: Calflora

- Good for data sharing
  - Important for EDRR species!
- Some built in data management
- Some features for dealing with messy treatment data



Baseline Data Fields

*Species Name

*Number of Individuals

*Percent Cover

*Phenology

*Date

*Surveyor

*Gross Area (autopopulated for polygons)

Distribution

Treatment

Treatment Type

Percent Treated

Notes

Data Topics Q&A

Rapid Response Strategies

RR is the point!

One Tam Rapid Response Example

STAFF, CONTRACTORS, AND VOLUNTEERS SPENT 792 HOURS TREATING PRIORITY ONE SPECIES IN 2019, COMPARED TO 12,145 HOURS ON PRIORITY TWO SPECIES. THIS DIFFERENCE CAN BE ATTRIBUTED TO THE LOW NUMBER OF PRIORITY ONE POPULATIONS.

Rapid Response Goals

One Tam goal is to treat 100% of Priority One species every year.

- ~65% of Priority One populations under management in 2019
  - ~ 85% in 2022
  - Lesson learned: review your data
- 38% of Priority Two populations under management in 2019

Rapid Response Strategies

- Treat on Surveys
- Schedule extra treatment days as needed

Rapid Response on Surveys

WHAT-TO-TREAT CHEAT SHEET

DO TREAT IF

- Patch <100m2,
- AND is at least 20m from another patch of the same species,
- AND the treatment can be completed in 10 minutes,
- AND the amount of weeds to carry away is manageable.

DO NOT TREAT IF

- Patch >100m2,
- OR patch <100m2 but near more patches of same species,
  - For example, if you find a 1 square meter patch of *Ehrharta erecta* every 21m, it is not feasible to treat
- OR patch requires >10 minutes to remove,
- OR amount of plant biomass that must be hauled away is prohibitive.

Rapid Response on Surveys

EXCEPTIONS

- For Priority One species, it may be prudent to push these numerical boundaries. If you find a Priority One patch that will take 30 minutes to remove but it's ready to seed and it is unlikely anyone else will be able to treat it in time, initiate treatment.
- It's sometimes justifiable to treat just a portion of a large patch of a Priority One species, such as to push the patch edge out of a creek or trail corridor.

WHEN-TO-BAG GUIDELINES

- Plants with reproductive propagules should be bagged.
- Many grasses and asters can mature to reproductive viability even after being pulled out of the ground. Bag plants from these two families even if they're only flowering.

Rapid Response

- Can you reserve a few days a month for rapid response by crews for important detections?

Rapid Response

Strike a balance between your goals and feasibility. Where you find something might be a big factor in treatment feasibility

- Examples from One Tam
  - Stipa manicata
  - Maytenus borianus

Rapid Response Days

- Be hardcore about BMPs
- Expect it to take longer than you think
- Take the time to search adjacent suitable habitat
- Have a plan for propagules – better to not touch the population than to spread it

Survey Gear

Surveying Equipment

- Pack
- Device
  - Loaded with maps, data
- Binoculars/Monoculars
- Specimen bags

Safety Equipment

- First aid kit
- Radio
- High vis (roads/riparian)

Personal

- Water
- Lunch
- Sunscreen

Treatment Equipment

- Hori hori/pick
- Pruner
- Hand saw
- Weed bags

BMPs

- Brushes
- Gaiters

Rapid Response Q&A

Integrating EDRR into Existing Weed Management Programs

- One off treatments don't eradicate a population.
- How will you follow up in subsequent years?

Tradeoffs

- Can you shift some resources from legacy weed control projects?
  - Consider in days/dollars/percentages.
- Can you secure funding?
  - Pro Tip: WMAs are back and funding many projects.
- Can volunteers do some of your existing weed control?
- Contractors?

Squeeze it in!

- On hikes to sites.
- Focus on places you already manage.
- Drop 15 minutes of a task to look for a few targets.

Planning for future EDRR

- Can you commit to putting X percentage of any new funds or positions toward EDRR?

Set Realistic Goals

- Limit your list and geography as needed.
- Put RR priorities onto your calendar/work plan for subsequent years.
- Review treatment options when timing stacks up.

EDRR can be great for morale

Approaches for starting small

Approaches for starting small

1. Allocate a fixed amount of time and do something

Potential framework

- Half day data/field prep
- 3 days surveying
- 1 day rapid response
- Half day QC

Approaches for starting small

2. Put a BOLO on two to five plants

- Train field staff on two to five new weeds.
- Give them a simple tool (and time!) to map them.
- Raise awareness through bulletin boards, break rooms, newsletters, etc.

Informal EDRR is more than no EDRR.

Approaches for starting small

3. Mine Existing Data

Pick two to five species to explore.

- Calflora
- iNaturalist
- Ask neighboring agencies if they've seen these weeds locally.
- Ask questions at your WMA meetings.

Simply learning about distributions of uncommon weeds will help you prioritize.

Approaches for starting small

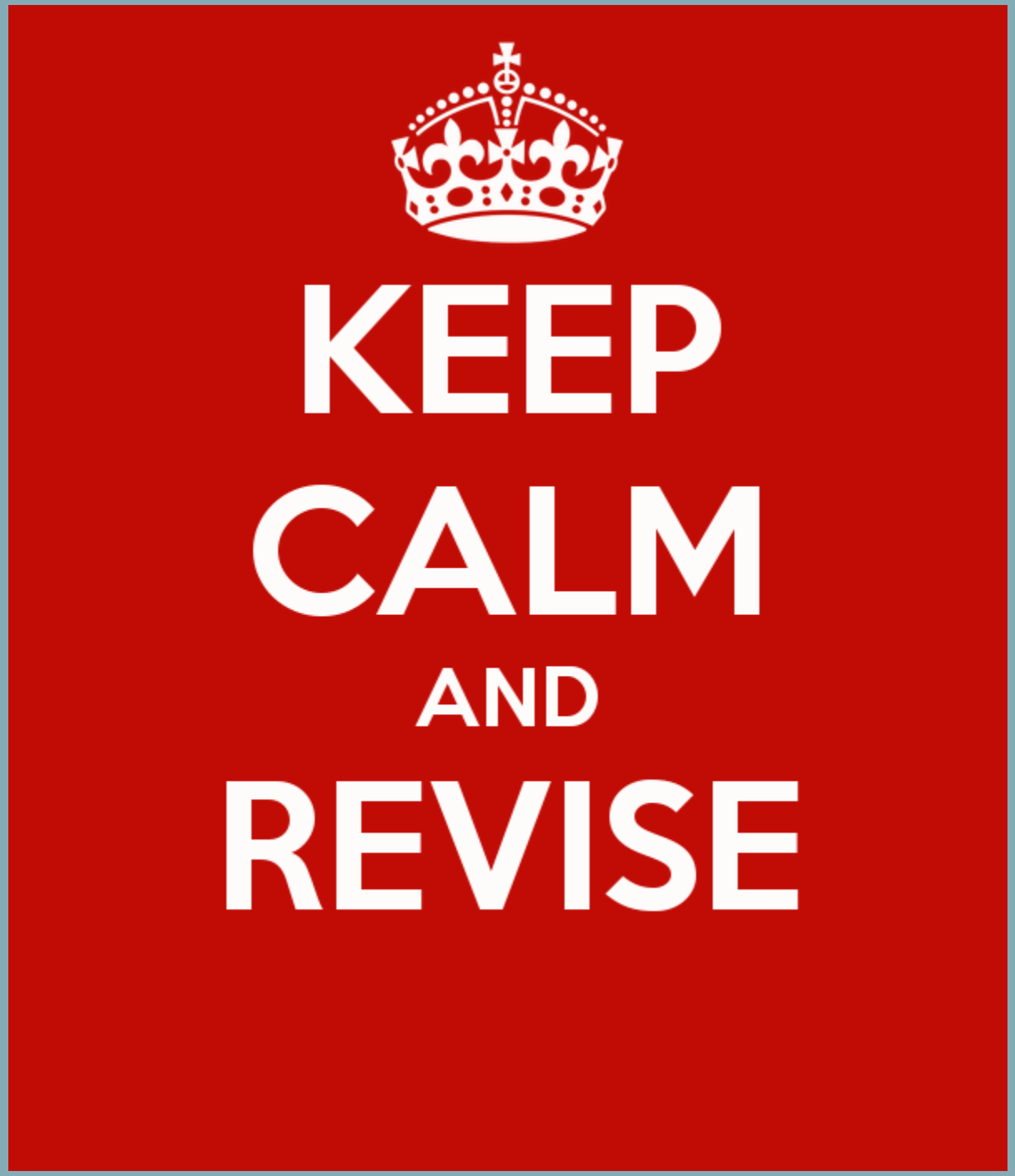
4. Start at the left side of the curve with Prevention if you don't have time for EDRR.

Pirate my existing presentations

Approaches for starting small: Notes for intrepid field staff

From Zero to Pilot

1. **Determine how much time you have for EDRR.** If you have 1 week of survey time, plan on 3.5 days surveying, 1 day data QC/prep, half day treatment
2. **Select Geography**
3. **Create Species List.** Then train on it.
4. **Choose data platform.** Develop mandatory fields. Use the data system and know you have to revise following pilot.
5. **Prepare for Treatments and BMPs** with equipment and training.
6. **Get out there. You've got this!**


KEEP
CALM
AND
REVISE

Review of resources to jumpstart your pilot

Program Development Resources

Documentation of Initial Considerations and Protocol Decisions

Use this form to document your discussions and decisions. Skip questions that you're not ready to answer. The blanks will remind you to answer the questions over time.

1. What Park units will you survey?
2. What areas within Park Units are the highest priority?
3. How many miles of roads and trails fall within the areas identified in question 2?
4. How many days might it take to survey the high priority areas for the first time? How many surveyors do you anticipate using for those days?
5. When will surveys occur, based on the habitat of the high priority areas and phenology of target species?
   - ☐ Year round?
   - ☐ Spring
   - ☐ Summer
   - ☐ Fall
   - ☐ Winter

   Notes
6. Will you perform treatments on surveys? Document any decisions regarding time to spend, limitations regarding propagules or species.
7. Who will perform surveys?
8. How often will you provide training?
9. Who will manage and analyze the data?
10. Protocol Decisions
    a. Points and/or Polygons – Note whether you will use autogeneration options and how to assign gross area if using points.
    b. What inter-patch distance will you use to denote distinct patches of the same species?

California State Parks
Early Detection and Rapid Response (EDRR) Handbook for Invasive Species Management

Prepared by:

California State Parks
Natural Resources Division (NRD)
1416 Ninth Street, Room 923
Sacramento, CA 95814

Revised 2020

by Leah Gardner and Rachel Kesel

Training Resources

Field exercises for staff training

Plant ID presentations

Plant list digital examples

BMP presentation

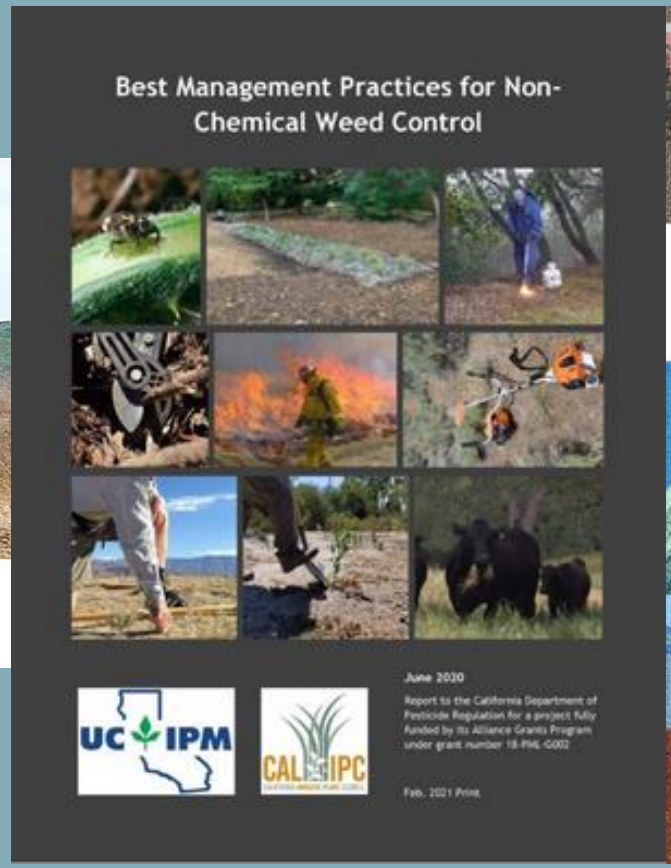
What to treat cheat sheet

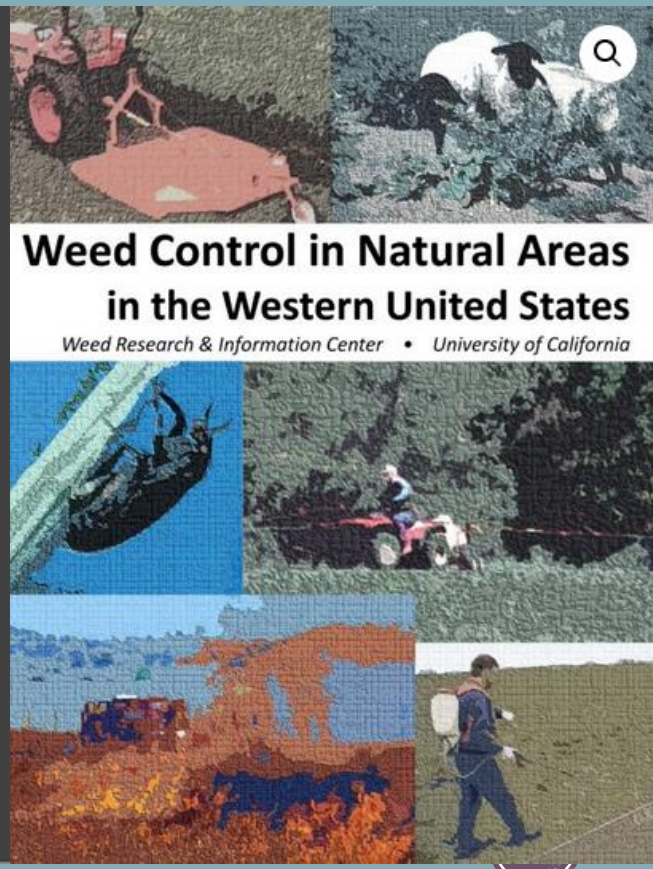
Other cheatsheets

Treatment Resources

Methods for Managing Weeds in Wildlands

Weed Control User Tool (WeedCUT)





Online Resources

Play Clean Go

iNaturalist

CAL IPC CALWEEDMAPPER

Final Q&A