Yellow Starthistle

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Making a Difference for California

Topics for Today's Discussion:

- Impacts of invasive weeds
- Biology and life cycles
- Control methods
- Yellow Starthistle Leading Edge Project
- Preventing new introductions and spread

Yellow Starthistle

- Native to Eurasia
- Introduced in the 1850's
- Annual
- Large plants can produce over 100,000 seeds
- Seeds can lay dormant 5 years

Yellow Starthistle - the Problem

- Over 14 million acres in CA
- Reduces value and carrying capacity of rangeland
- Major consumer of groundwater

Yellow Starthistle - the Problem

- Reduces recreational values and access
- Toxic to horses
- Degrades animal and plant habitat
- Reduces plant diversity

Yellow Starthistle Life Cycle

Seedling

Rosette

Bolting Stage

Flowering

Yellow Starthistle

- Loves sun; hates shade, competition
- Extensive and deep root system
  - Uses up to 50% of stored soil moisture
  - Root growth rapid winter and spring
  - Roots 6 ft. down utilize water lower

Yellow Starthistle

During bolting phase

- Waxy, grey coating reflects light
- Winged stems act as radiators
- Thrives under hot and dry conditions!

Yellow Starthistle

- Seeds spreads via gravel, fill dirt in roadways and at disturbed sites
- Seeds carried on equipment
- Seeds only blow a few feet from the plant
- Spread by animals

Yellow Starthistle Control - Cultural and Mechanical Methods

Cultural Control

- Grazing
- Burning
- Revegetation

Mechanical Control

- Mowing
- Hand pulling and hoeing

Biological Control


Grazing
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Photo by Craig Thomson

Grazing Strategies

- Time the grazing to damage YST when it's most vulnerable
  - at bolting (May-June); doesn't have the energy reserve to regrow and set seed that year

- Control the behavior of the animals
  - intensive, time-controlled can minimize grazers ability to avoid YST
  - overgrazing can encourage YST

Prescribed Burning

Critical factors for success:

- Timing
- Temperature

Revegetation

- Seeding to compete with YST
  - Broadcast seeding
  - Drill seeding
  - Dry land - best in late fall just before winter rains begin

Mowing


UC Davis Weed Science Program
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Photo by Joe DiTomaso

Growth form and stage of YST affects mowing success

- Best at late bolting, spiny, early flower stage
- Success linked to growth form
- 90% control with two timely mowings per year over three years

Growth Forms

Best growth form for mowing ↓

Hand pulling or hoeing

- Goal: stop seed production!
- Can be very effective
- Properly dispose of plant with seeds
- Use on small populations or isolated infestations

Biological Controls

Hairy weevil
Eustenopus villosus

False Peacock Fly
Chaetorellia succinea

Yellow Starthistle Control Using Herbicides

Chemical Control

- Herbicides used for YST control
  - Clopyralid
  - Aminopyralid
  - Glyphosate

Selective Herbicides

Clopyralid

- Trade Name: Transline
- Effective against many thistles (sunflower family)
- Can cause injury to legumes

Aminopyralid

- Trade Name: Milestone
- Effective against thistles (sunflower family)
- Legumes
- Some grasses
- Other problematic weeds including; tarweed, fiddleneck

Clopyralid & Aminopyralid

Very low use rates

- Clopyralid
  - 4-6 oz. product per acre for yellow starthistle
  - 6-10 oz. product per acre for harder to control thistles
- Aminopyralid
  - 3 oz. product per acre for yellow starthistle
  - 4-7 oz. product per acre for harder to control thistles

Clopyralid & Aminopyralid

- Post and pre emergent control
  - Kill weeds actively growing and prevents new weeds from germinating
- Clopyralid (Transline) has soil activity for 3-4 months
- Aminopyralid (Milestone) has soil activity for 4-5 months
- No grazing restrictions
- Can be surface or aerial applied
- *Proper timing can lead to full season control*

Treatment Timing

- Apply during the winter when plants are small
- Clopyralid: January - April
- Aminopyralid: December – April
- Both are slow acting - may take 2-3 weeks

How to Obtain These Chemicals

- Agricultural chemicals
  - Requires Operator Identification Number
    - for purchase, storage and use of chemicals
    - call Mariposa Dept. of Agriculture 209-966-2075 for appointment and what to bring
  - Use is documented and submitted to County
  - Herbicides sold in larger containers

Clopyralid

- Trade Name: Star Thistle Killer
- Same active ingredient as Transline
- Home-use label
  - No permit required
  - Available over the counter
- Sold in ½ pint container
  - Enough to treat 2 acres

Glyphosate

- Trade Name: Roundup, Honcho, Glystar, and many others
- Non-selective herbicide
- Can kill or injure most plants

- Post emergent herbicide
  - Only kills plants actively growing
  - No soil activity, does not prevent seeds from germinating

Treatment Timing

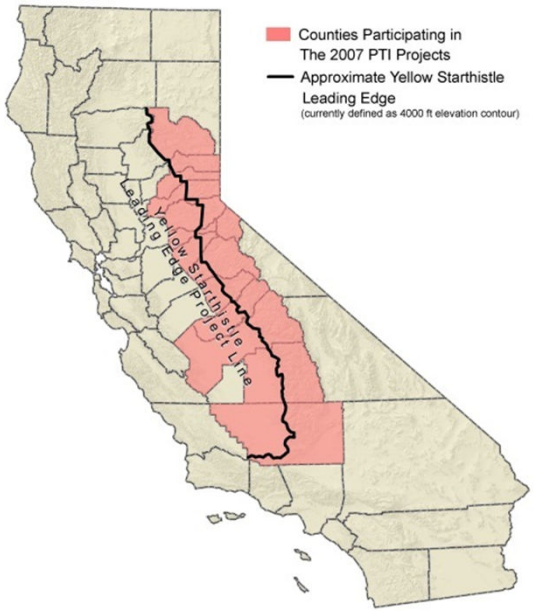
- Spot treatments
  - Spot treatments should be made after the last spring rain
- Broadcast treatments
  - Should be made after annual grasses and legumes die, but before bloom on Yellow Starthistle
- Rate
  - 6 to 24 oz. product per acre depending on plant size

Safety

- Read and follow the label
- Wear personal protective equipment
- Avoid sensitive areas (water bodies, non-target plants)
- Avoid drift

Stop the Spread of Yellow Starthistle into the Sierra Nevada Mountain Range

Early Detection and Eradication on a Regional Scale



Project Goals

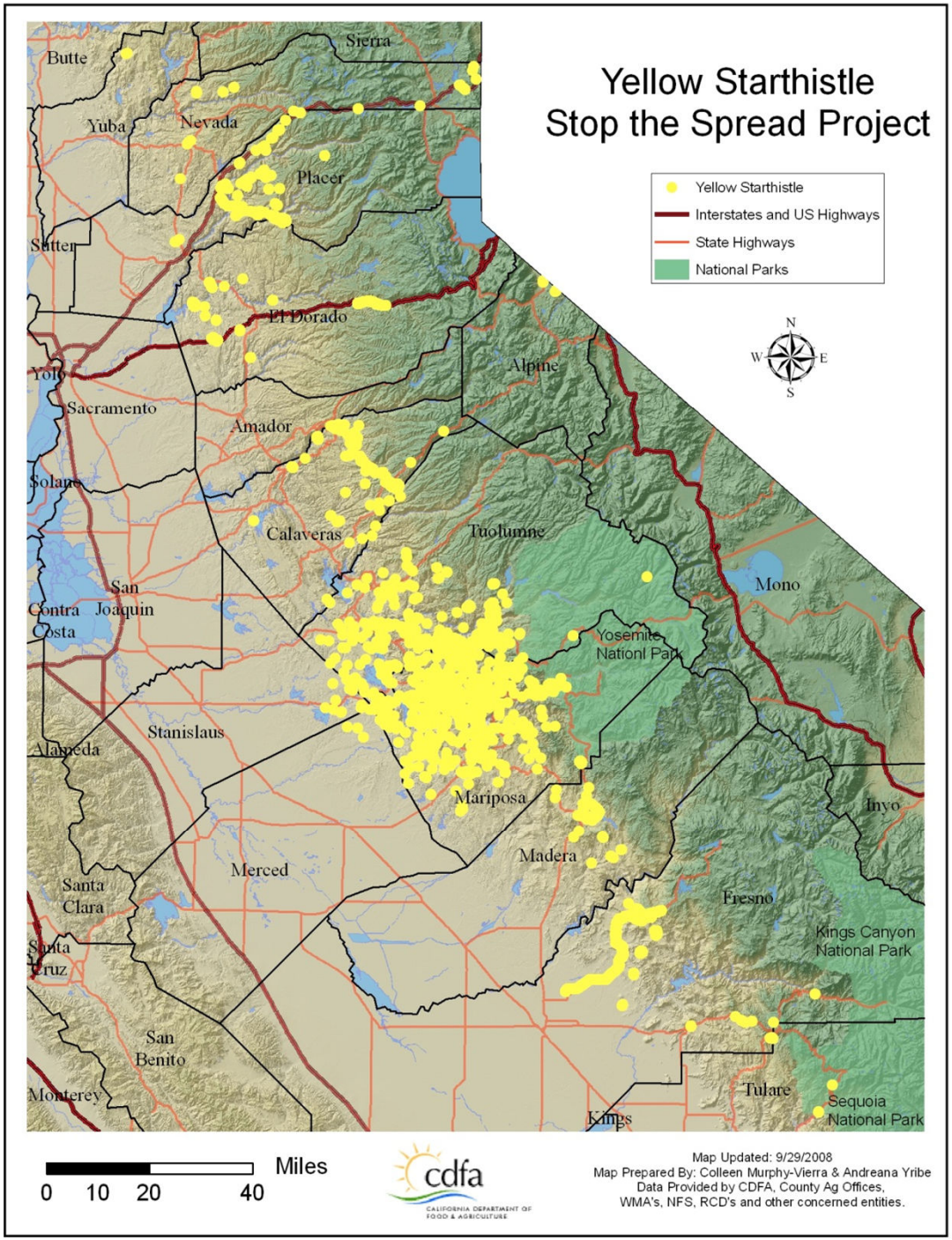
- Identify a YST “no spread line”
- Coordinate efforts to stop eastern spread
- Eradicate outlier populations east of the line

Why is this project important?

- FOCUSED effort to control YST
- Agency and landowner collaboration
- Early detection and rapid response can work!
- Save $$$ by stopping the spread NOW!

Connect the "dots" across the region

Each county surveying and controlling



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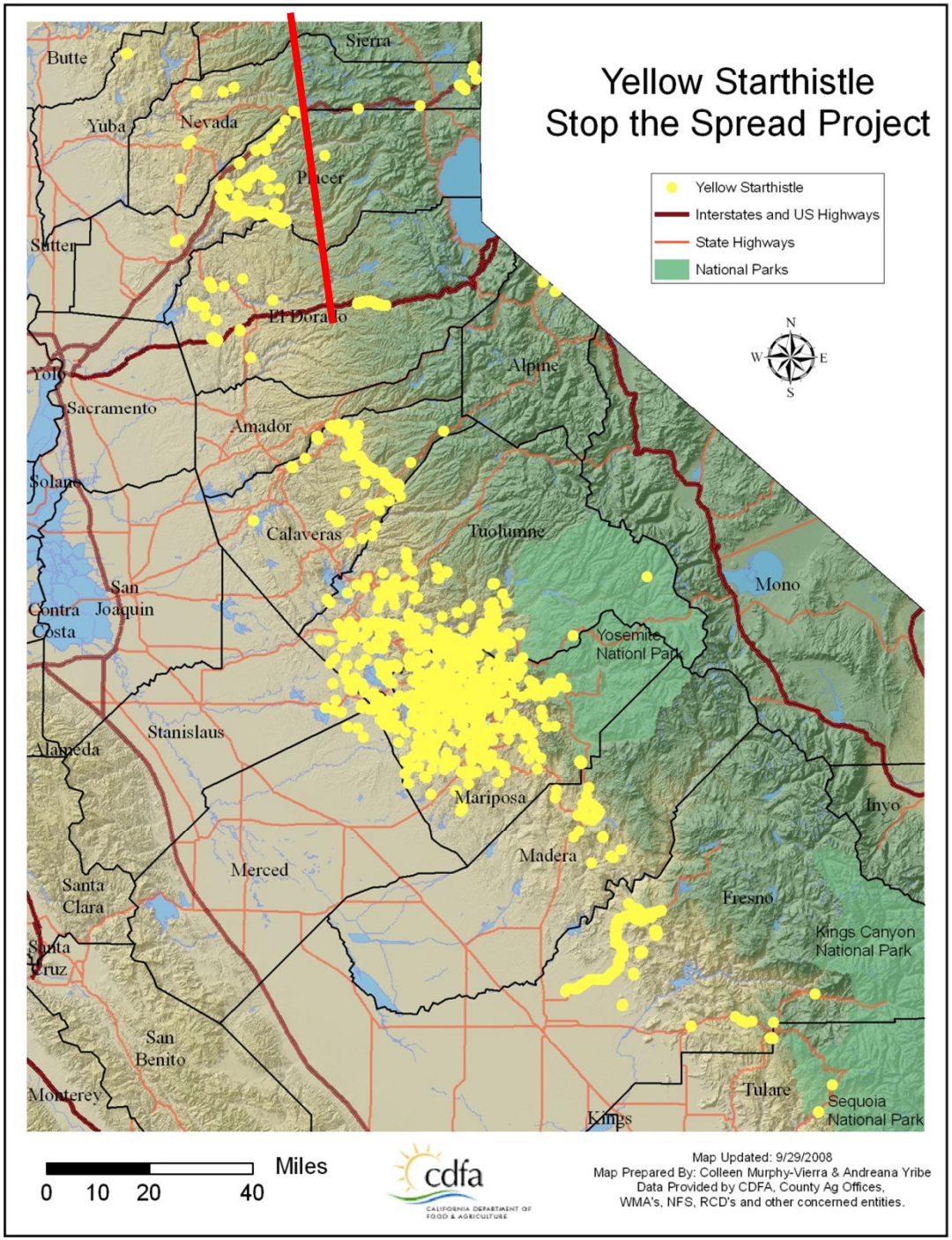

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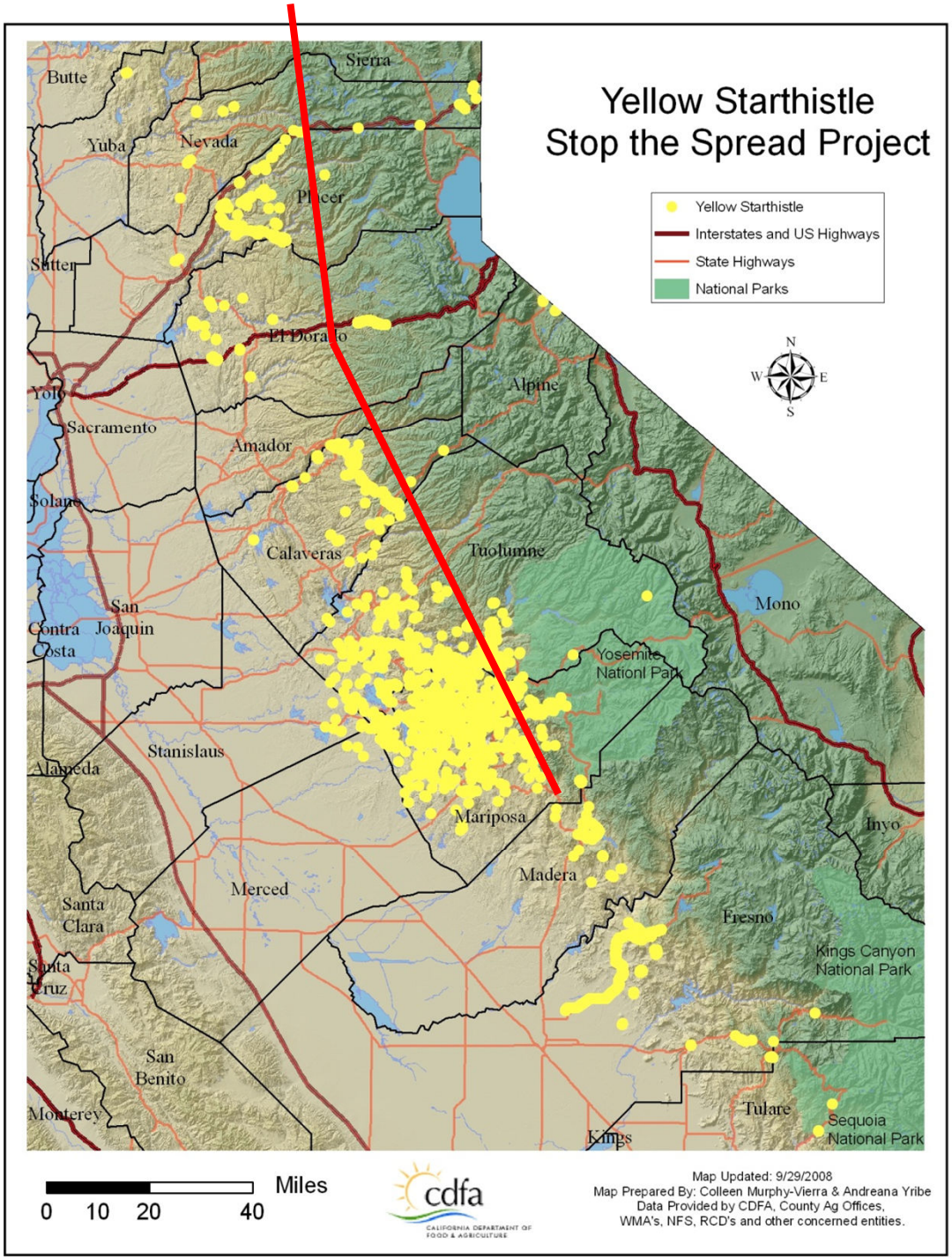
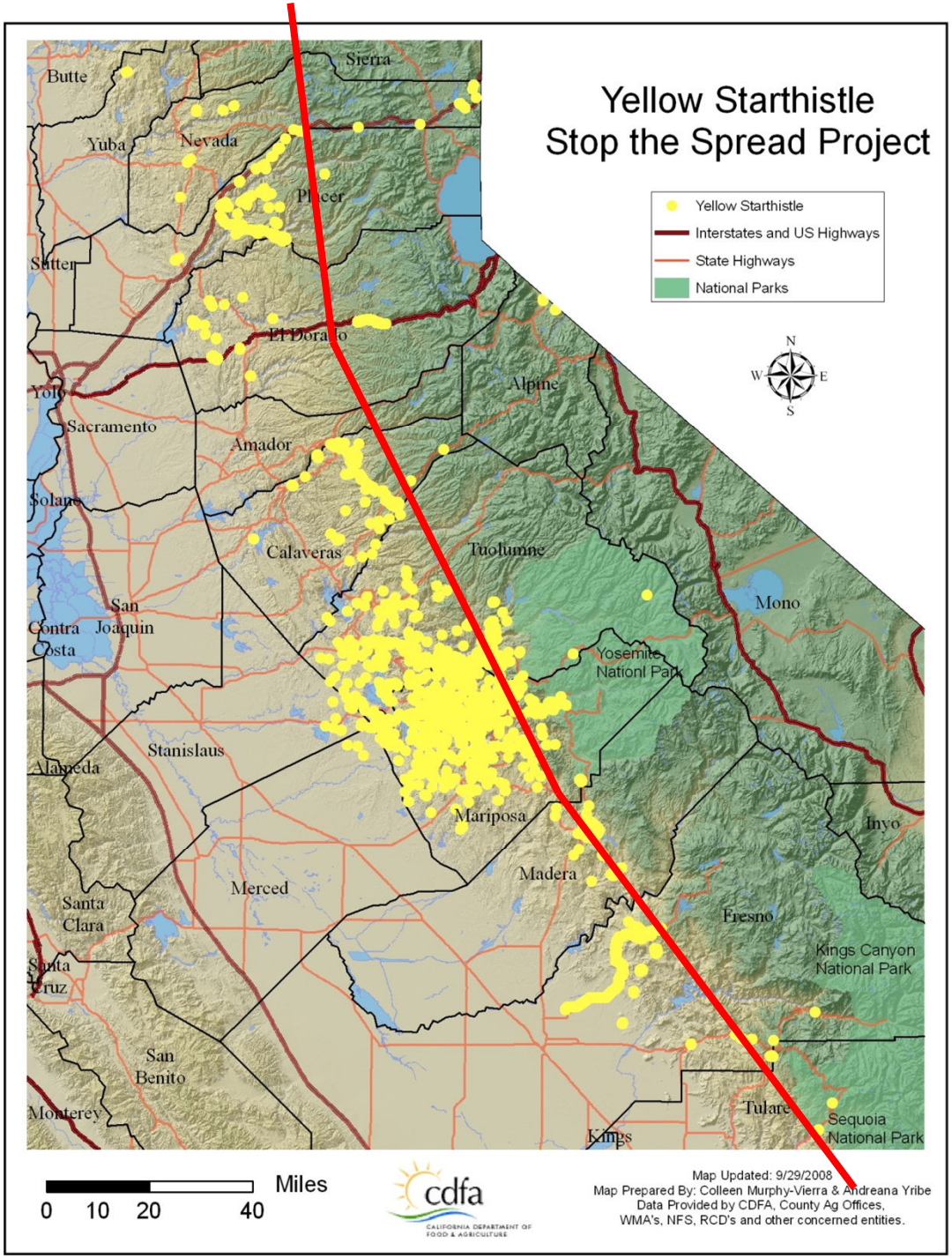


Connect the "dots" across the region

Continue work to eradicate outliers



Yellow Starthistle
Leading Edge Project – 2010

- **13,000 acres (gross) surveyed and mapped**
- **282 acres (net) treated**

Why is Preventing the Spread and Introduction Important?

- Avoid establishment of new infestations
  - Detect early
  - Eradicate early
  - Save money!
- Prevent spread of a known infestation
  - Contain infestations
  - Stop spread beyond a leading edge line

How Invasive Weeds Spread

- Animals and birds
- Humans – on boots, clothing, pets
- Wind and water
- Escaped ornamentals
- During activities that cause disturbance
  - e.g. equipment, road materials

Site-Disturbing Projects

- Construction areas – homes and offices
- Road construction and improvements
- Construction of fire breaks
- Fire evacuation routes
- Clearing to reduce fire fuels
- Ditches

Site-Disturbing Projects

Why worry about weed spread during site disturbing projects?

- Seed bank
- Bare ground – invasives love open areas
- Seeds, plant parts moved by equipment

Prevention Tips

- Learn which plants are considered invasive in your area
- Inventory plants (desirable vs. invasive) on your property and along access roads before a site-disturbing project begins
- If invasive weeds are present, treat them before disturbing the soil in an area (ideally for 3 to 5 years prior)

Prevention Tips

- Minimize the soil disturbance and retain desirable vegetation

Prevention Tips

- Require all equipment used on your property to be cleaned BEFORE work begins to remove:
  - seeds
  - plant fragments

Diffuse knapweed at equipment storage yard

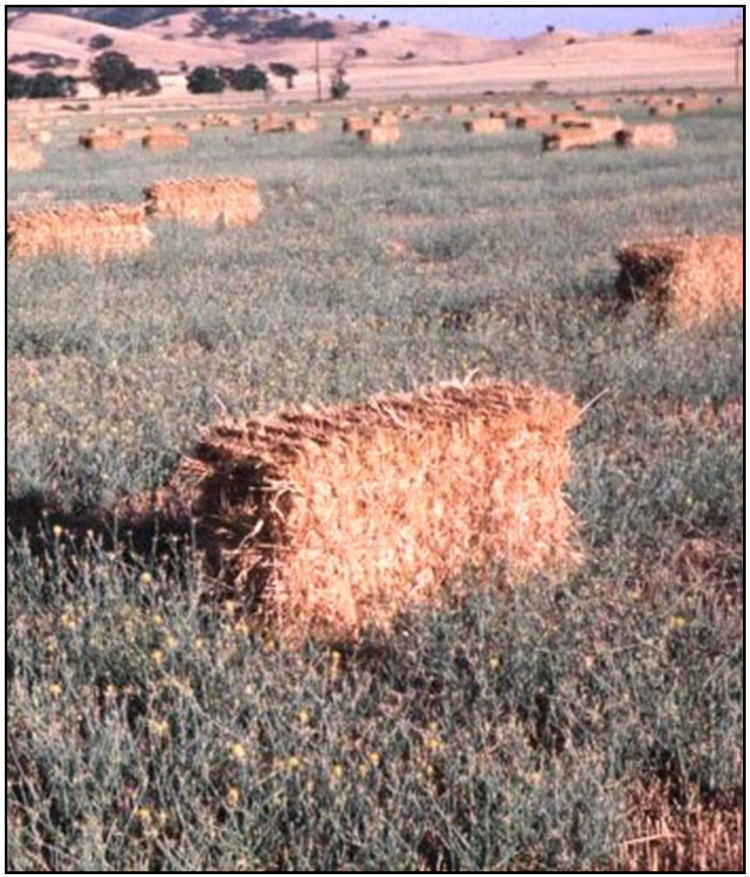
Prevention Tips

- Mark off known infestations and request equipment operators to work in these areas last

- When practical, salvage weed-free topsoil and replace it on disturbed areas; healthy topsoil will enhance revegetation

Prevention Tips

- Request weed-free materials (fill, gravel, sand, mulch, straw, etc.) from suppliers



Straw from a YST infested field

Prevention Tips

- Re-establish vegetation on all bare ground
- Mulch to “shade out” invasive weeds and prevent seed germination

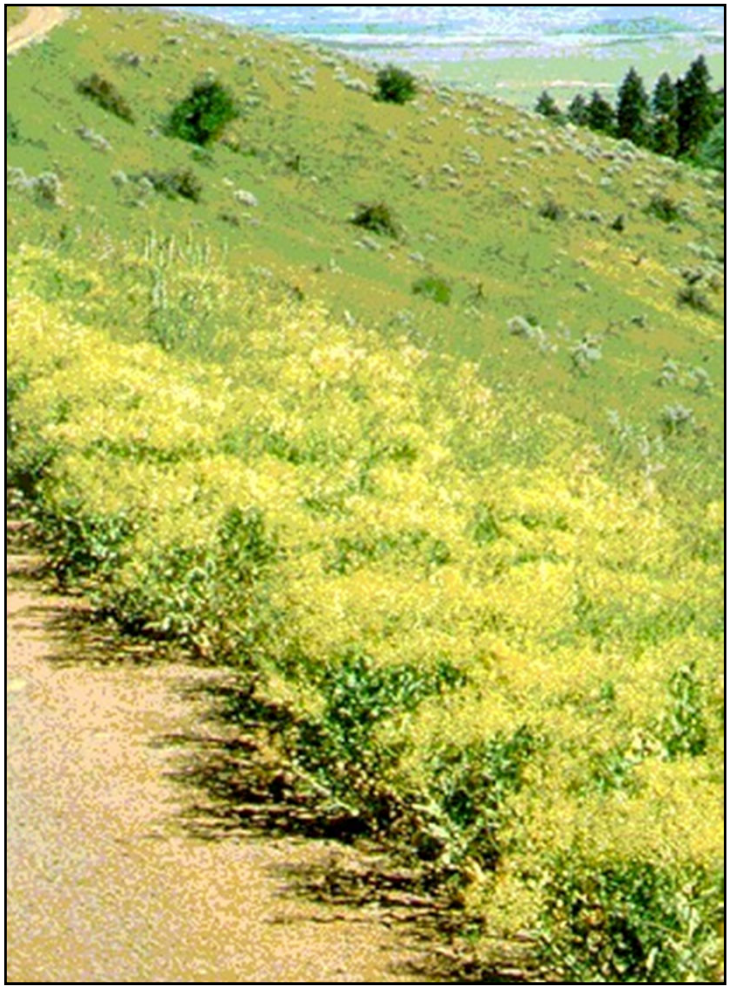
Revegetation project

Prevention Tips

- Inspect the project site for at least three growing seasons after completion of project

Prevention Tips

- Weed infestations should be controlled immediately to prevent further spread!



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Remember!

Prevention and early detection

are the most cost effective invasive weed control methods!

Questions?

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