

Environmental Problems from Marijuana Cultivation on Public Lands

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- Environmental Scientist: Pesticide/Wildlife Investigations
- Pesticide investigations are a function of Wildlife Investigations Laboratory.
- Headquartered at Region 2 in Rancho Cordova.

**SLIDES COURTESY OF
MOURAD GABRIEL
AND
GRETA WENGERT,
INTEGRAL ECOLOGY RESEARCH CENTER**



It all started with the fisher.



Fishers

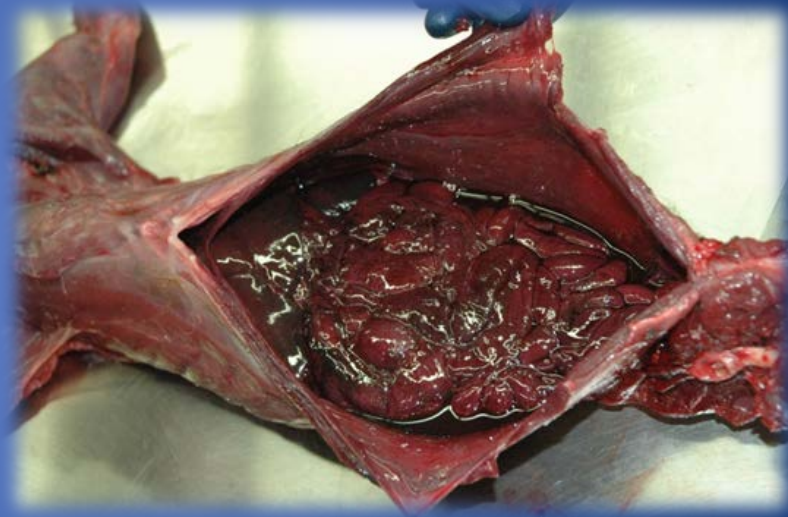
- Member of weasel family
- Opportunistic omnivore
- Live in old growth forests in northern California.
- 2 small populations in California
- ~1,100 individuals
- Proposed for state and federal listing under Endangered Species Act



Fisher Project

- Project to re-establish population of fishers. Radiocollaring and tracking.
- 2009 – a male fisher found dead for unknown reasons
- Found to have died from anticoagulant rodenticide poisoning
- 58 fishers tested

- 79% exposed to anticoagulant rodenticides
- 4 mortalities



Mourad W. Gabriel 2012

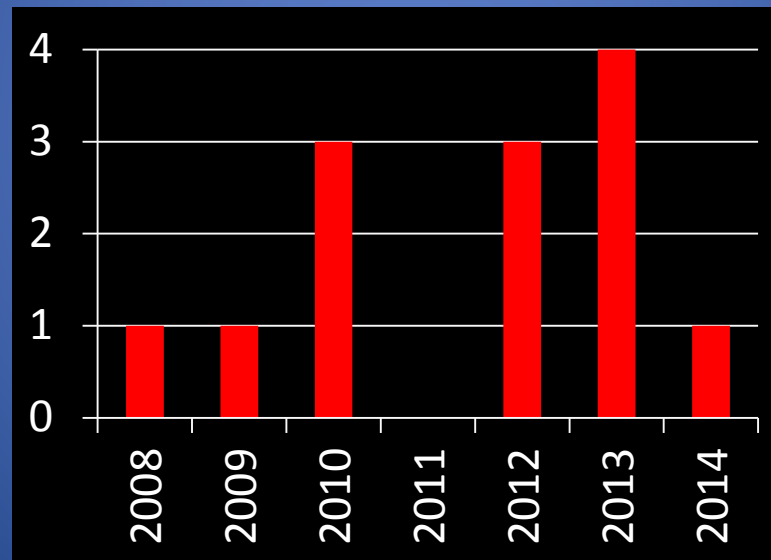
Anticoagulant rodenticides

- Cause death by impairing clotting
- Mortality occurs several days after exposure
- ARs are persistent in tissue
- Secondary exposure common in predators and scavengers
- Regulation change 2014: California Restricted Materials

Update: 2012 – 2014

8 new cases **+1** Reassignment = **9 additional cases**

- Now a total of **13** fisher deaths (only monitored fishers)
- Two cases with suspected new toxicants
 - Bromethalin (presumed) and cholecalciferol (presumed)



We've got a problem.

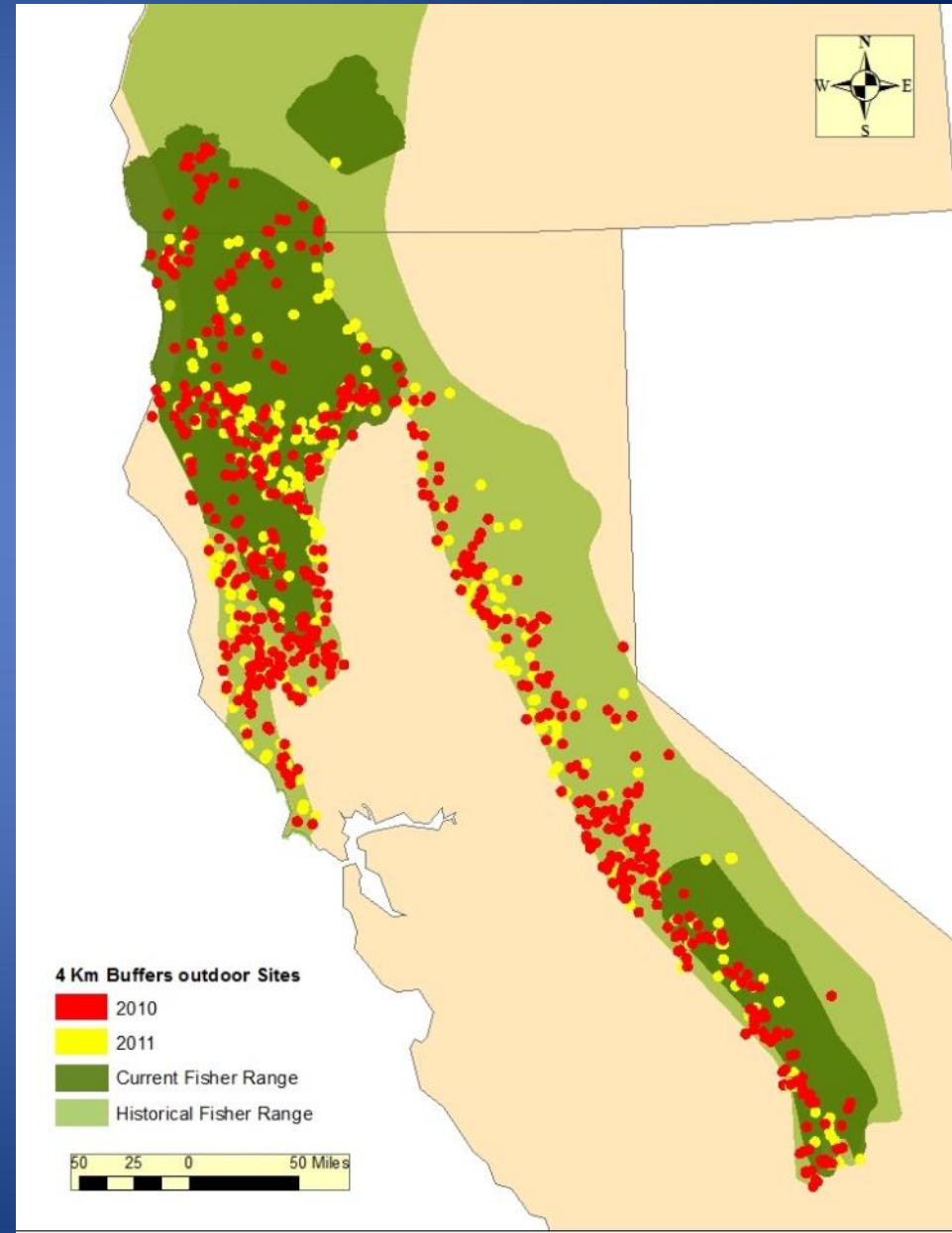


(Gabriel 2012)

2010 -2011

Trespass Marijuana Sites within the Fisher's Range

- **~1,100** trespass grow sites eradicated
- Liberally, **only 40-60%** sites are discovered.
- Only a fraction are cleaned.
- Sites have the potential to impact **30-35%** of fisher's current range.



What does Marijuana Cultivation look like on Public Lands?



Trinity Alps Wilderness



Natural Resource Exploitation

Water



Diversions

Forest



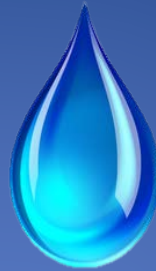
Fragmentation

Wildlife

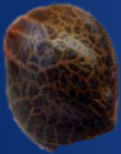


Contamination

Public Land Water Diversion Rates



6-8 gallons a day



150 days

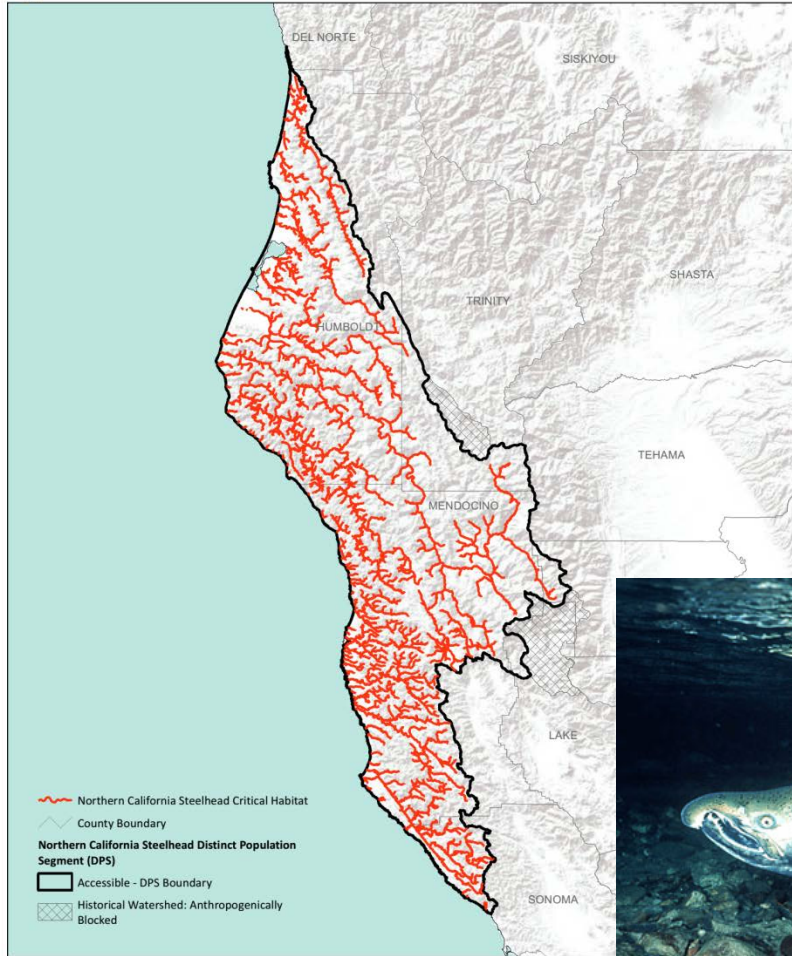


900 - 1,200 gallons per plant/season

Trout and salmon need water!



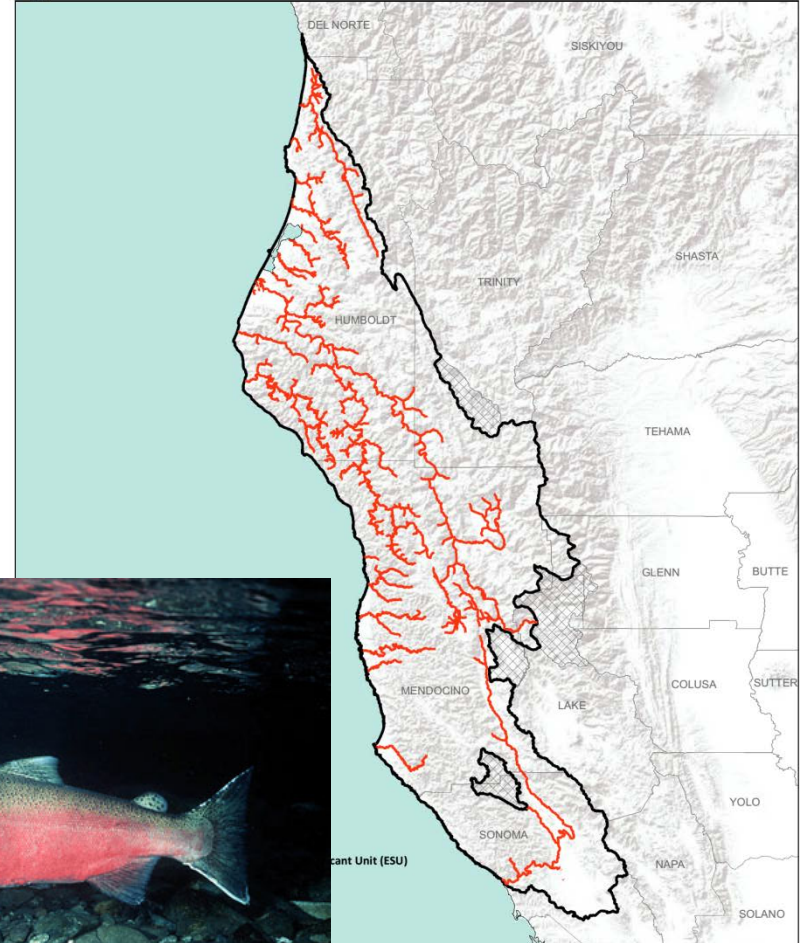
Critical Habitat Northern California Steelhead



See Federal Register Notice for detailed description
DOC-NO



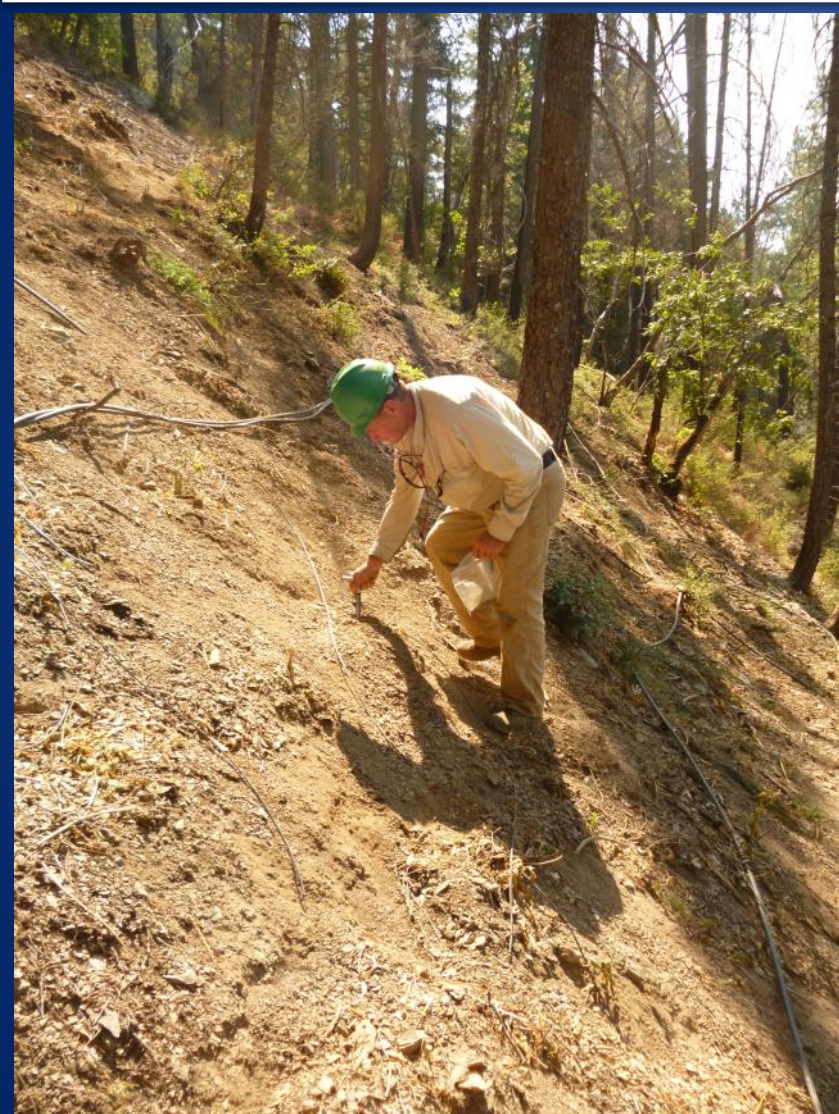
Critical Habitat California Coastal Chinook Salmon



See Federal Register Notice for detailed description of critical habitat (70 FR 52488)
DOC-NOAA Fisheries-West Coast Region

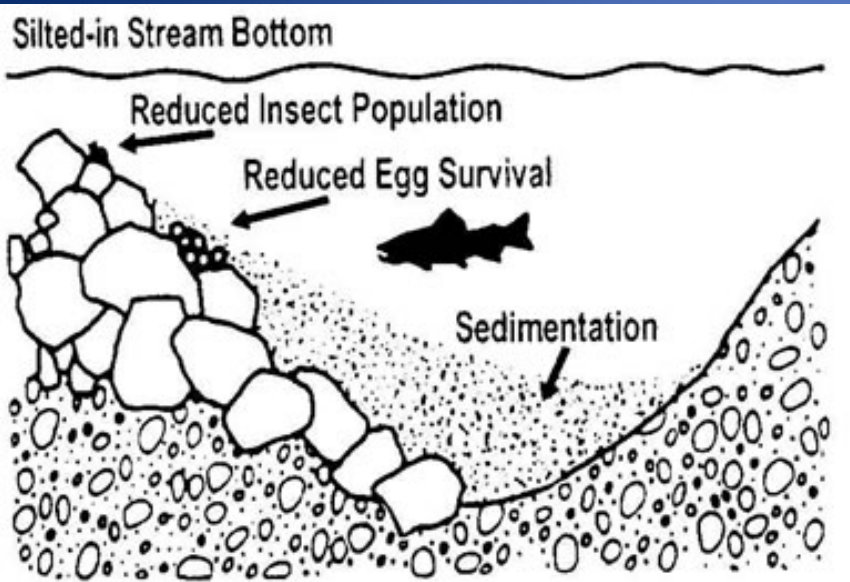


Forest Fragmentation



Fragmentation

- Loss of trees
- Loss of habitat
- Increased erosion
- Sedimentation into creeks



Wildlife Contamination



Pesticides and Pot Farms

- What's been found:
 - ❖ Anticoagulant rodenticides
 - ❖ Acute rodenticides (Strychnine, bromethalin, aluminum phosphide, zinc phosphide)
 - ❖ Carbamates (Carbofuran, Carbaryl, Methomyl)
 - ❖ Organophosphates (Diazinon, Metamiphos)
 - ❖ Molluscides (Metaldehyde)
 - ❖ Herbicides (Glyphosate, etc.)
 - ❖ Pyrethroids (Bifenthrin, Lambda cyhalothrin)

Will the Recent CA Anticoagulant Restrictions Help?

Replacement rodenticides taking their place

BROMETHALIN (Neurotoxicant)

- Flavorized
- No Antidote
- Very difficult to interpret (pathology)

Recent Grow (2014) had 28 pounds of Bromethalin



What do pesticide trends tell us?

- It is possible to grow crops without poisoning wildlife.
- A few bad actors can cause a lot of damage.

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Bad Actors on Marijuana Grows



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Carbofuran

- Furan: carbamate insecticide
- Introduced in 1970s – phase-out started in 1980s
- Extreme toxicity to birds (also toxic to fish, reptiles, amphibians and mammals)
- Used on multiple crops in multiple formulations.



It's back....

- Poisoning in Africa
- Poisoning of bears, mountain lions, and other wildlife on illegal marijuana grows.



Current Collaborative Efforts

- Interdisciplinary approach
- Working with Federal, State, Academia and NGOs
“Out of the Box” approach.



Sequence of Remediation



1. Enforcement: Secure site



2. Scientists: Inventory environmental damage



3. Volunteers: Clean up



Removing These Threats to Wildlife

October 2014, Number of trespass sites cleaned: 7

Personnel per day: 50 (25 Officers & N. Guard; 25 Sci. Team & Volunteers)

Total water diversion restored to watersheds: 67.5 million gallons

Total amount of fertilizer used at sites: 8,188 pounds

Total amount of rodenticide used at sites: 128 pounds

Insecticide used at sites: 560 gallons of usable insecticide

Carbofuran used at sites: 68 ounces concentrated carbofuran

Garbage removed: >8,000 pounds

Irrigation pipe removed: >8.5 miles



Future Challenge: Prevention



Thank You!



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