

Cal-IPC Annual Meeting

Visalia, CA
October 9, 2009

*Aquatic Weed
Management: A
Survey of
Techniques &
Environmental
Impacts 2001-
Present*

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Today's Talk

- Types of Weeds
- Available Tools
- Regulatory Update
- Water Quality Impacts



Types of Aquatic Weeds

- Emergent
- Riparian
- Floating
- Submersed
- Algae

Emergent

- Cattails
- Tules
- Bulrush
- Ex. Golf Course Ponds



Riparian (that may become aquatic)

- Blackberry (terrestrial)
- Arundo
- Pampas Grass
- Ex. Urban Creeks





Floating

- Primrose
- Duckweed
- Azolla
- Ex: Laguna de Santa Rosa







Submersed

- Pond Weeds
 - Sago
 - American
 - Curly Leaf
- Milfoil
- Hydrilla
- Ex. Irrigation Canals



Algae

- Planktonic
 - Ex: Microcystis
- Filamentous
 - Ex: Anabaena, Planktothrix
- Ex. Drinking Water Reservoir



Anabaena 1600x



Tools for Control

- Biological
- Mechanical
- Chemical
- Other



Biological Control

- Ex. Goats for Emergent and Terrestrial Weeds



Mechanical Control

- Hand Cutting for Emergent Weeds
- Harvesters for Floating Weeds



Chemical Control

- Only 10 registered for Use in CA



Chemicals

Triclopyr

Diquat Dibromide

Glyphosate

Fluridone

Na₂CO₃ Peroxyhydrate

Non-Ionic Surfactants

2,4-D

Imazapyr

Endothall

Acrolein *

Copper *

Regulatory Constraints

- 2004 NPDES Aquatic Pesticide Permit
- 2006 Red Legged Frog
- 2009 Goby 11



NPDES Aquatic Pesticide Permit You Need One if.....

- You apply aquatic pesticides to “Waters of U.S.”
- Your chemical leaves a “residue” greater than its WQO or “Produces Unintended Effects”
- Perceived CWA Violations and Subsequent Citizen Lawsuits Concern You



“Waters of the U.S.”



“Water Quality Objectives”



Chemical	WQO (ug/L)
Triclopyr	N/A, monitoring required
Diquat Dibromide	20
Glyphosate	700
Fluridone	560
Na ₂ CO ₃ Peroxyhydrate	Pending
Non-Ionic Surfactant (nonylphenol)	6.6
2,4-D	70
Imazapyr	N/A, monitoring required
Endothall	100
<i>Acrolein</i> *	320
<i>Copper</i> *	3-52 (Hardness Dependent)

*** Requires SIP Exception**

Red Legged Frog



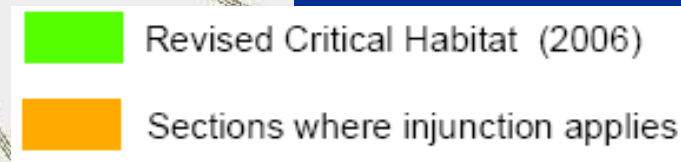
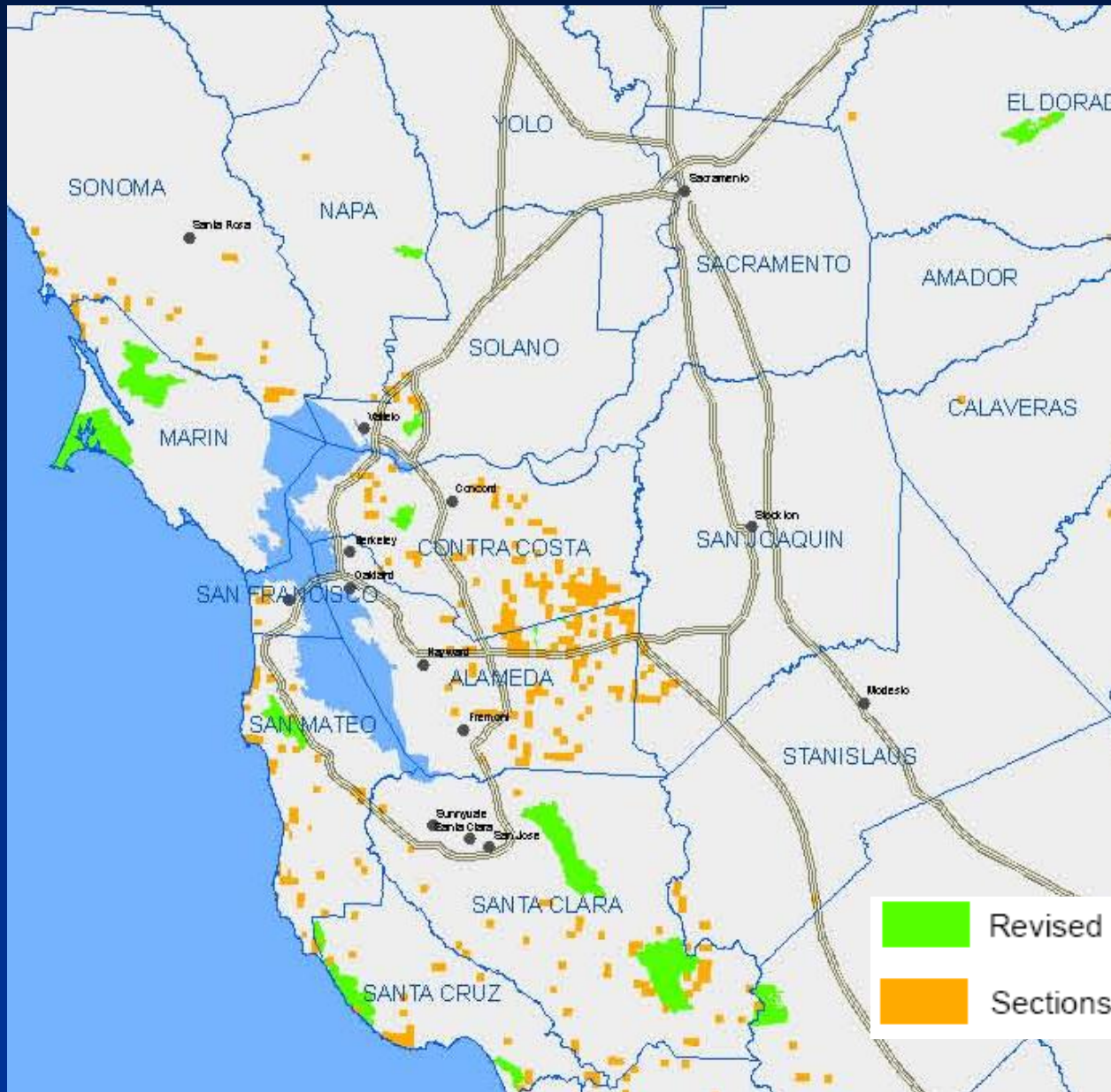
- Oct 2006: Stipulated Injunction
- 66 pesticides restricted within designated habitat

Red Legged Frog

- 4 aquatic pesticides on list:
 - Imazapyr
 - 2,4-D
 - Glyphosate
 - Triclopyr
- ~40K Ac & 33 Counties



Examples of RLF Habitat in Northern California



RLF Habitat Restrictions

- No applications
 - Ground: < 60' of habitat
 - Aerial: < 200' of habitat
 - Spot treatment >15' away OK
- Exceptions:
 - Public Health Vector Control
 - Invasive Species & Noxious Weeds



“Goby 11”

- ESA Failure Alleged by CBD
- 11 Species
- 74 Pesticides
- 8 Counties



“Goby 11”

- 11 Species

- Tiger salamander
- SJ Kit Fox
- Alameda Whip Snake
- SF Garter Snake
- Salt Marsh Harvest Mouse

- CA Clapper Rail
- CA Freshwater Shrimp
- Bay Checkerspot Butterfly
- VELB
- Tidewater Goby
- Delta Smelt

“Goby 11”

- 3 Aquatic Pesticides

- 2,4-D
- Acrolein
- Diquat



- 8 Counties

- Alameda
- Contra Costa
- Marin
- Napa
- San Mateo
- Santa Clara
- Solano
- Sonoma

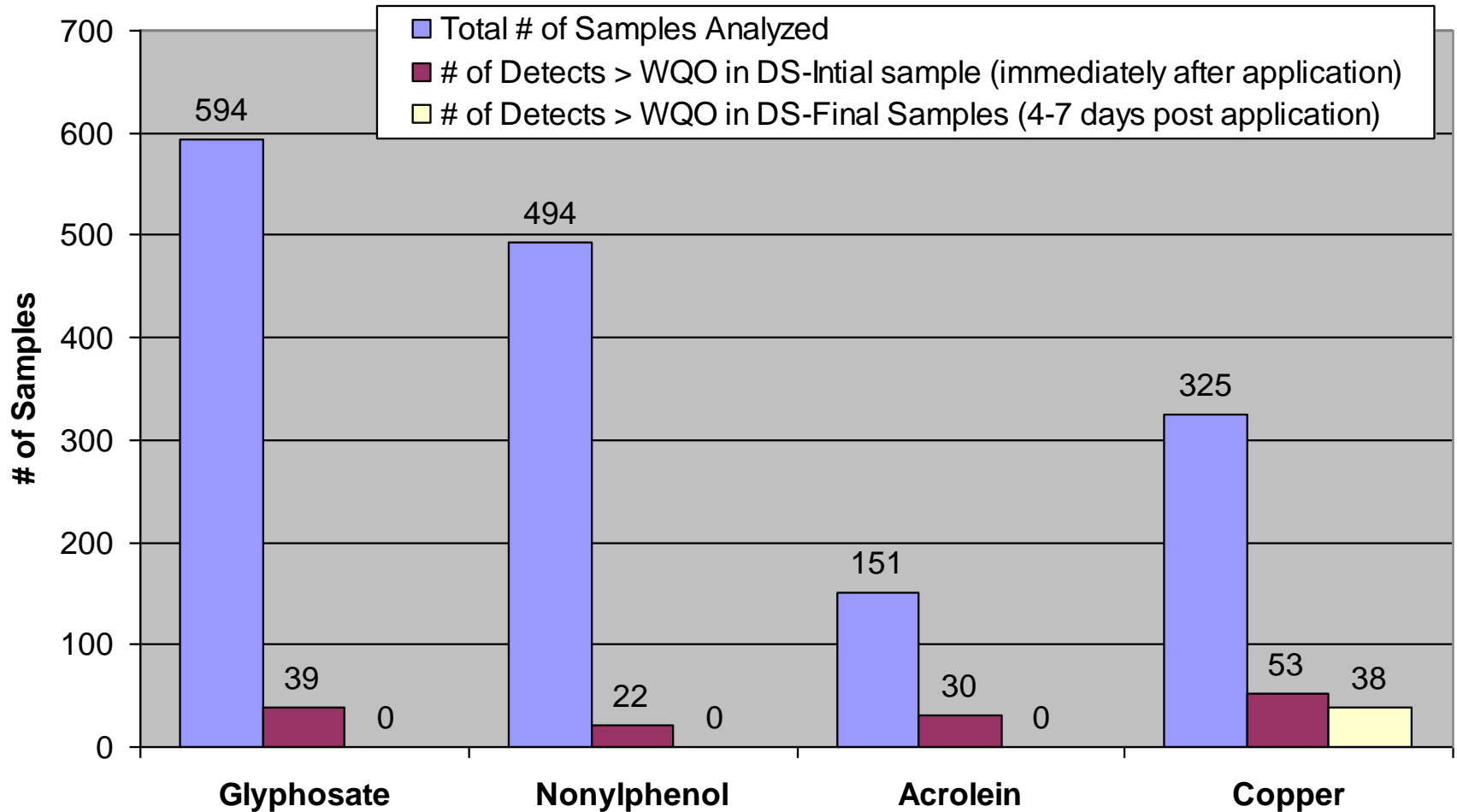
“Goby 11”



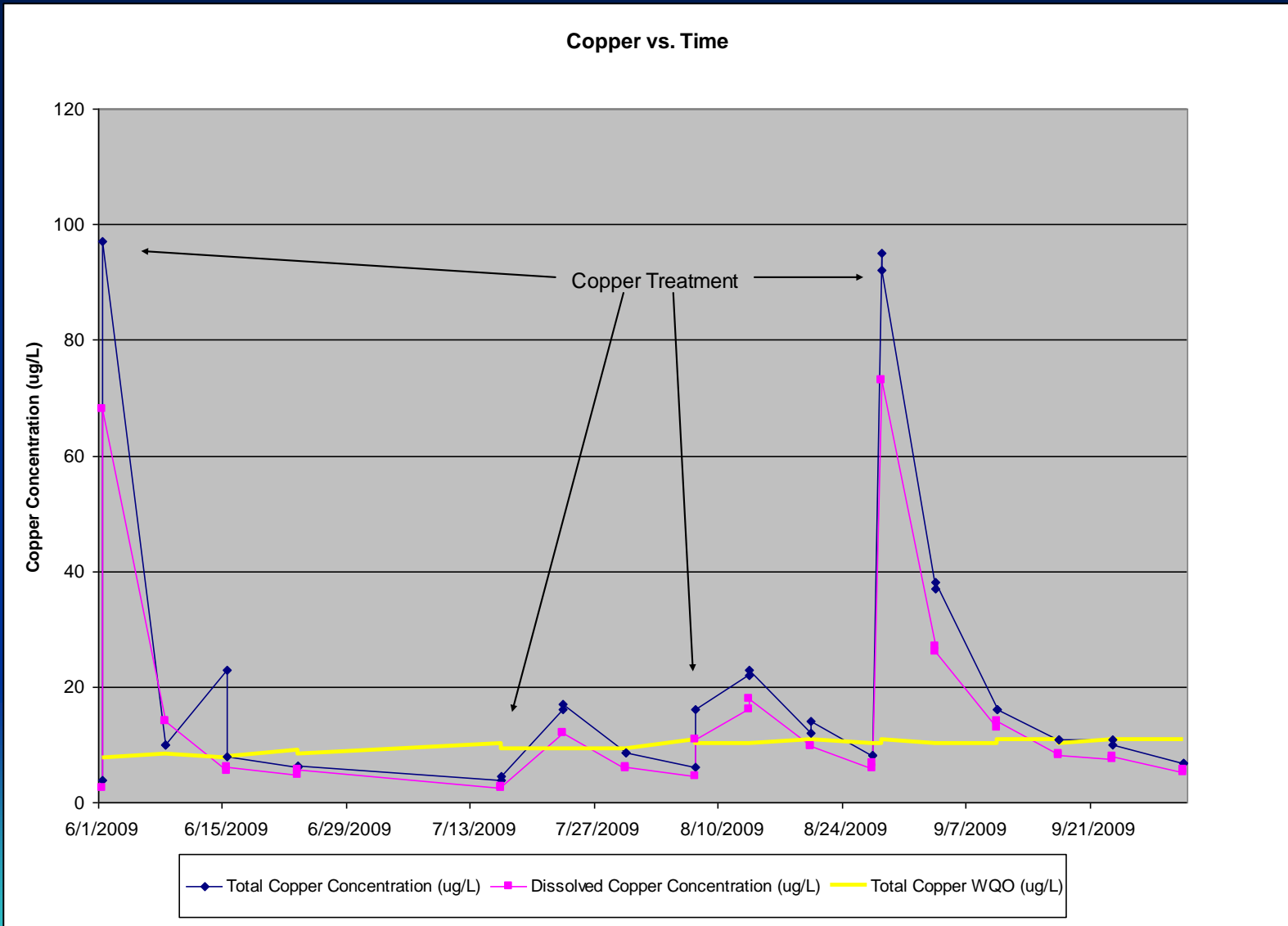
- No use within habitat
- Must use 100 - 400 ft. buffer Zones

Water Quality Impacts

Aquatic Pesticide Sample Analysis 2002-2007



Water Quality Impacts





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