

# **Vertebrate Pest Control**

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**California Department of  
Food and Agriculture**

# Vertebrate Pests



# Vertebrate Pest Control Research Advisory Committee

Vertebrate Pest Control Research Advisory Committee

Welcome to the website for the Vertebrate Pest Control Research Advisory Committee, or VPCRAC for short. This site is the information outlet for VPCRAC and provides users with information regarding the mission and research of VPCRAC.

**What do we do?**

VPCRAC research projects investigate effective and economical alternative materials for the control of vertebrate pests. We solicit and consider research proposals for alternative humane methods of control, and continue the state's current vertebrate pest control product registrations until such time as effective alternative products are available.

This research is for the development of scientific data required to maintain registrations. VPCRAC cooperates with the US Department of Agriculture in funding research programs to maintain, develop, and register vertebrate pest control materials used in California.

**PRIVATE APPLICATOR MATERIALS**

The following are links to study materials to assist you in study.

[Applying Pesticides](#)  
[CDFA Vertebrate Pests](#)  
[Pesticide Label Components](#)  
[Worker Safety](#)  
[Sample Treated Grain MSDS](#)  
[Sample Rodenticide Label](#)  
[Grower Handbook of Pesticide Regulations](#)

**Featured Research**

[Using Liver Microsomes to Screen Anticoagulant/ Antibiotic Formulations for Ground Squirrels and Pocket Gophers](#)

**Animal Subject:** Ground Squirrels Pocket Gophers  
**Control Method:** Anticoagulant/ Antibiotic

[Research Project page](#)

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**Current Research Projects**  
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[Surcharge Legislation](#)  
[Vertebrate Pest Handbook](#)  
[Bait Sales Kings County](#)

**Wildlife Society Conference**  
[Go to event website](#)  
**From:** 2011-11-05 to 2011-11-10  
18th Annual Conference in Waikoloa, Hawaii.

[Site Survey](#)

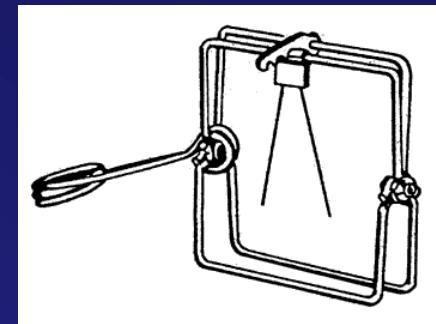
# CDFA Maintained Labels

Product	Pests	Use Sites	Methods
Diphacinone Grain .005%	Ground Squirrels, Norway and Roof Rats, Wood Rats, Voles, Jack Rabbits, Cottontail, Chipmunks, Muskrats	Ag Buildings, Crops, Range, Forestry, NonCrop, Waterways (muskrat)	Bait Stations, Spot Baiting
Diphacinone Grain .010%	Ground Squirrels, Deer Mice, House Mice	Vineyards, Orchards, Groves, Forestry, Pasture, Range, NonCrop	Broadcast Baiting
Chlorophacinone Grain .005%	Ground Squirrels, Voles, Chipmunks, Muskrats, Jackrabbits, Norway, Roof and Wood Rats	Ag Buildings, Crops, Range, Forestry, NonCrop, Waterways (muskrat)	Bait Stations, Spot Baiting
Chlorophacinone Grain. 010%	Ground Squirrel, Voles, Deer Mice, House Mice, Pocket Gophers	Vineyards, Orchards, Groves, Forestry, Pasture, Range, NonCrop	Broadcast Baiting, Mechanical (gophers)
Zinc Phosphide.Grain 2%	Ground Squirrels, Voles, Norway and Roof Rats	Dormant Fruit, nonbearing nursery stock, Tree Plantations, Vineyards, Range, Pasture, NonCrop, Ornamentals. NonResidential Lawns, Golf Courses	Handbaiting, broadcast, aerial, trail builder, bait stations
Diphacinone .005% Wax Block	Norway Rats, Roof Rats, House Mice	Within 100' of buildings and transport vehicles	Bait stations
Chlorophacinone .010% Artichoke	Voles	Artichoke fields	spot baiting

# **AB 711, Rendon. Hunting: nonlead ammunition PASSED**

- 1) Requires use of nonlead ammunition for the taking of all wildlife in California, including mammals, game birds, nongame birds, and nongame mammals, with any firearm.
- 2) Requires the Fish and Game Commission (FGC), by July 1, 2014, to certify by regulation, nonlead ammunition for these purposes.

# AB 789, Williams. Trapping PASSED



- 1) Reduces the maximum size of conibear traps (spring-loaded body-crushing traps, without teeth) used to kill mammals, except where they are submerged, partially submerged, or set in a managed wetland, from 10" X 10" to 6" X 6".
- 2) Requires a sign warning that dogs should be kept away from areas where conibear traps are set on publicly owned land or land that is open to the public.
- 3) Prohibits killing any trapped mammal by intentional drowning, injection with any chemical not sold for the purpose of euthanizing animals, or thoracic compression.

# AB 2657, Bloom. Anticoagulants PASSED

- Prohibits the use of second generation anticoagulants in “wildlife habitat areas”.
- Wildlife habitat areas - any state park, state wildlife refuge, or state conservancy.

# SB 1332, Wolk. Carbon Monoxide PASSED

- “**carbon monoxide** pest control device” means any method or instrument using **carbon monoxide** to prevent, eliminate, destroy, or mitigate burrowing rodent pests.
- Require the director of DPR to regulate the use of **carbon monoxide** pest control devices, and adopt and enforce regulations to provide for the proper, safe, and efficient use of these devices for the protection of public health and safety, and the environment.

# DPR Carbon Monoxide Enforcement Letter

## October 17, 2012

- *Q: Where can these devices be used?*
- A: FAC section 6025.4 states that carbon monoxide must never be used in "structures inhabited by humans or livestock." These devices can be used in certain agricultural and non-agricultural settings. However, because of the hazards of this form of pest control and the fact that there is no warning agent and no permit required, DPR would not consider use of these devices at residences, school grounds, parks, or other sensitive sites to be "perform[ing] pest control in a careful and effective manner" as required in 3CCR section 6600(b).

# AB 2210, Williams. Nongame Animals DEAD

- Specifies nonnative eastern fox squirrel (*Sciurus niger*) replacing red fox squirrel.
- Changes once daily trap check to once every 24-hour period.
- Requires nontarget species be released unharmed and not taken.

# SB 457, Bobcat Protection Act

## Amended

- Unlawful to trap bobcats in area around Joshua Tree National Park
- Possible ban near boundaries each national/state park, monument, or refuge where bobcat trapping is prohibited.
- Possible statewide ban.
- Fees passed on to trappers
- Depredation trapping is excluded.

# Fish and Game Commission Predator Policy

Regulations under review:

-Structural Concerns:

Separate regulations for recreation/commerce/depredation, urban trapping issues, trapping gear restriction zones, unlimited harvest

-Ecological Concerns ( May 2015)

-Ethical Concerns (September 2015)

Next Meeting September 9, 2015 Fresno, CA

# Vertebrate Pest Control Options

Best to follow an integrated approach:

- Biocontrol
- Habitat Modification
- Exclusion
- Trapping
- Baiting
- Fumigation
- Shooting
- Other

\*check with County Ag. Commissioner office for any  
Endangered Species Restrictions.

# Control Options—Biocontrol

- Natural predators have been used to control vertebrate pests.
- Owl boxes are inconclusive at best.
- Gopher snakes kill a few gophers but are unlikely to control populations.



# Control Options—Habitat Modification

- Involves altering habitat to reduce the desirability for pests.
- Example:
  - remove brush piles to control ground squirrels.
  - reduce cover for voles.



# Control Options—Exclusion

- Wire baskets and raised flower beds can be used to exclude gophers.
- Tree protectors can reduce or eliminate damage caused by voles.



# Control Options—Exclusion

- May be a control option to consider for voles.
- Plastic mesh-style fencing has been effective at slowing movement of voles into artichoke fields.
- Fencing should be buried at least 6 inches below ground and extend 6-10 inches above ground.
- Aluminum flashing may provide more long-term functionality.
- Must consider equipment movement into and out of fields.



# Control Options—Baiting

- Involves use of poison baits to control vertebrate pests.
- There are acute and multiple-feed toxicants.

	Anticoagulants	Zinc phosphide	Strychnine
Ground squirrels	X	X	
Pocket gophers	X	X	X
Voles	X	X	

# Control Options—Baiting

	WINTER	SPRING	SUMMER	AUTUMN
MAJOR ACTIVITY PERIODS				
adults				
reproduction				
juveniles	■			
MAJOR FOOD SOURCE				
green foliage		■		
seeds			■	
BEST TIME FOR CONTROL				
fumigation		■		
baiting			■	
trapping			■	

# Anticoagulants

- Toxic bait that inhibits the coagulation of blood in the target pest.
- Widely used for commensal rodent control.
- Also used for the control of field rodents.
- Can be separated into two distinct groups:
  - first generation anticoagulants  
(warfarin, chlorophacinone, diphacinone)
  - second generation anticoagulants (brodifacoum, bromadiolone, difenacoum, difethialone)

# 1<sup>st</sup> Generation Anticoagulants

- Warfarin, the first anticoagulant rodenticide, discovered in 1943.
- The first generation anticoagulants are chronic in their action.



# 2<sup>nd</sup> Generation Anticoagulants

- Genetically linked resistance in rats and mice to 1<sup>st</sup> generation anticoagulants.
- Concern over resistance stimulated research in Europe.
- Research led to the development and marketing of brodifacoum, bromadiolone, difethialone, and difenacoum.
- Acutely toxic to rodents.

# Control Options—Baiting

## Anticoagulants

- require multiple feedings
- can be used for spot treatment, broadcast or in bait stations.



# Acute Toxicants

- **Acrolein, Aluminum Phosphide, Gas Cartridges, & Strychnine** - Registered for controlling burrowing rodents (i.e. California ground squirrels and pocket gophers).
- **Avitrol®** - Bird management chemical registered for blackbirds, cowbirds, starlings, grackles, house sparrows, and feral pigeons as a flock-frightening repellent.
- **Zinc Phosphide** - Used on grain baits and bait blocks to successfully control meadow voles, pocket gophers, ground squirrels, Norway rats, Polynesian rats, cotton rats, and nutria.

# Control Options—Baiting

## Zinc phosphide

- Is an acute toxicant
- Potential bait shyness
- Can be used for spot treatment and broadcast baiting
- Not to be used in or around buildings



# Control Options—Baiting

## Pocket gophers

- Strychnine works best.
- Use probe to find tunnel.
- Dispense bait in tunnel.



# US EPA Risk Mitigation Decision

In 2008 US EPA released a Risk Mitigation Decision for Ten Rodenticides. The decision included two major components to reduce children's exposure to rodenticides used in homes and to reduce wildlife exposures and ecological risks.



# US EPA Risk Mitigation Decision

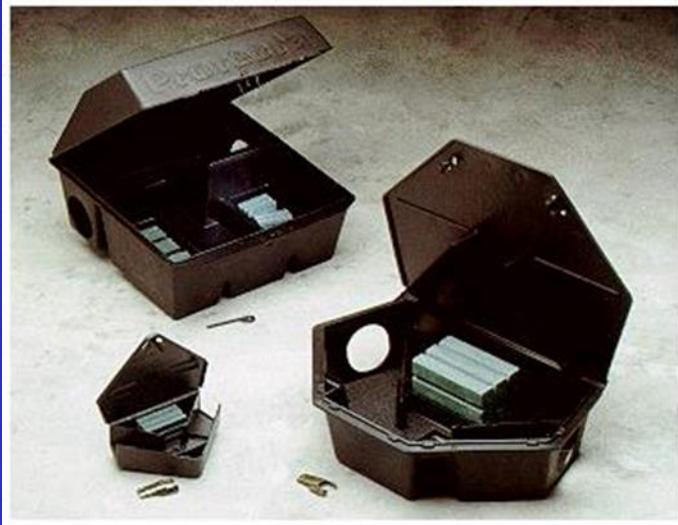
## Consumer Products:

- No second generation anticoagulants
  - Brodifacoum
  - Bromadiolone
  - Difenacoum
  - Difethialone

# US EPA Risk Mitigation Decision

- Must be packaged with ready-to-use tamper resistant baitstation.
- Non-refillable onetime use or refillable station but must not exceed one pound of bait.
- Meal, treated whole-grain, pelleted and liquid forms of bait are prohibited.

# US EPA Risk Mitigation Decision



- Below ground uses excluded from bait station and solid bait “block” requirement (Gopher/Mole).

# US EPA Risk Mitigation Decision

## Ecological/Non-Target Risk Mitigation:

- Minimum package size. 2<sup>nd</sup> gen. anticoagulants in packages 8-16 lbs. Labeled for use inside and within 100' of agricultural buildings.
- 16+ lbs. packaged for use in and within 100' of man-made structures.
- Sale/Distribution Restrictions. 2<sup>nd</sup> gen. products will only be sold in agricultural, farm and tractor supply stores or directly to PCO's.
- Bait stations required for all outdoor above-ground placements of 2<sup>nd</sup> gen. anticoagulants.

# DPR 2<sup>nd</sup> Generation Restricted Use

- Designate all SGARs as restricted materials
  - Only certified applicators can purchase and use these products
- Limit the aboveground use of baits within 50 feet of a man-made structure unless there is a “feature” associated with the site that is harboring or attracting the target pest between the 50-foot limit and the limit specified on the label (typically 100 feet)
- Revise definition of private applicator to refer to the federal definition of agricultural commodity.
- Effective July 1, 2014

# Acute Toxicants

- Non-anticoagulant rodenticides include: zinc phosphide, bromethalin, and cholecalciferol.
- Refer back to 1998 RED.
- Consumer size  $\leq$  1 pound of bait above ground in a bait stations.
- Underground baiting for moles and pocket gophers exempt, can use grain or pellets for manual underground baiting.
- Agricultural use or professional applicators:
  - Does not have to be sold in a bait station, but label must require if children or non-target animals have access.
  - Any form of bait acceptable.
  - Must contain more than 4 pounds of product.

# Field Uses of Anticoagulants

- 1998 Reregistration Eligibility Decision made field uses of anticoagulant baits Federally Restricted Use pesticides. This requires a Private Applicator Certificate to purchase and apply.
- Agricultural use or professional applicators:
  - Does not have to be sold in a bait station, but label must require if children or non-target animals have access.
  - Any form of bait acceptable.
  - Must contain more than 4 pounds of product.

# Bait Stations

- Bait stations can be used to provide a continuous supply of treated grain when large numbers of ground squirrels are invading from open areas.
- Pre-bait first.
- Bait with anticoagulant .005% treated grain



UC Statewide IPM Project  
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# Hand Baiting



# Do not clump or pile bait!



# Broadcast Baiting



# Aluminum Phosphide

- **Restricted Material – Permit required**
- Use is strictly prohibited around all residential areas: homes, hospitals, nursing facilities, day care and schools (except athletic fields, where use may continue).
- The products must only be used outdoors for control of burrowing pests, and are for use only on agricultural areas, non-crop areas and non-residential institutional or industrial sites.

# Aluminum Phosphide

- Products must not be applied in a burrow system that is within 100 feet of a building that is or may be occupied by people or domestic animals.
- Posting requirements: the applicator shall post a sign at the application site containing the signal word DANGER/PELIGRO (Athletic fields: DO NOT ENTER/NO ENTRE, FIELD NOT FOR USE), skull and crossbones, the name and EPA registration number of the fumigant, and a 24-hour emergency response number. Signs may be removed 2 days after the final treatment.
- Fumigant Management Plan.

# EPA Review of small gas cartridges

- Periodic Registration Review
- Ecological Risk Assessment indicates some endangered species could be at risk
- Waiting on USFWS to release Biological Opinion
- Geographic restriction as means of mitigation to be considered
- Next step – release Proposed Interim Decision for public comment

# Control Options—Fumigation

- Involves use of poison gas in burrows to control vertebrate pests.
- Works best when soil moisture is high (late winter early spring for gophers, after ground squirrels emerge in spring).
- Fumigants should not be used around buildings.

	WINTER	SPRING	SUMMER	AUTUMN
MAJOR ACTIVITY PERIODS				
adults				
reproduction				
juveniles				
MAJOR FOOD SOURCE				
green foliage				
seeds				
BEST TIME FOR CONTROL				
fumigation				
baiting				
trapping				



# Control Options—Fumigation

## Aluminum phosphide

- Tablets can be used for ground squirrels and gophers.
- Is a restricted use pesticide.



# Control Options—Fumigation

## Gas cartridges

- Only work on ground squirrels.
- Caution must be used with gas cartridges to prevent fires.



# AB 634 Carbon Monoxide

This bill would authorize the use of carbon monoxide for the control of burrowing rodent pests, only until January 1, 2018, and only if the carbon monoxide delivery device is permanently affixed with a specified warning label in plain view of the operator, subject to specified provisions governing (1) the protection of endangered species, (2) the mode of taking a fur-bearing animal, and (3) pest control operations and the use of agricultural chemicals, as specified.

\* Never use in structures inhabited by humans or livestock.

# AB 634 Carbon Monoxide

DANGER: Carbon monoxide is a poisonous gas that is odorless and colorless. Exposure to carbon monoxide can kill within minutes. Never use in structures inhabited by humans or livestock. The device must be used in accordance with all existing laws and regulations including Chapter 1.5 (commencing with Section 2050) of Division 3 of, known as the California Endangered Species Act, and Sections 4002 and 4003 of, the Fish and Game Code.



# Control Options—Trapping

- Control of small populations of ground squirrels, gophers, and rabbits.
- Also effective at certain times of the year when other methods are less effective and can be a good follow up to alternative control methods.
- There are many different kinds of traps but all fall into 2 categories:
  - Kill traps
  - Live traps



# Control Options—Trapping

- Body-gripping traps, box-type squeeze traps, snap traps, and pincer traps are common kill traps.
- Wire cage traps are common live traps.
- Live traps require euthanization of vertebrate pests.



# CA Dept Fish & Game Regulations

## §465.5. Use of Traps.

- (g) (1) Immediate Dispatch or Release. All furbearing and nongame mammals that are legal to trap must be immediately killed or released....
- (2) Trap Visitation Requirement. All traps shall be visited at least once daily by the owner of the traps or his/her designee... Each time traps are checked all trapped animals shall be removed.

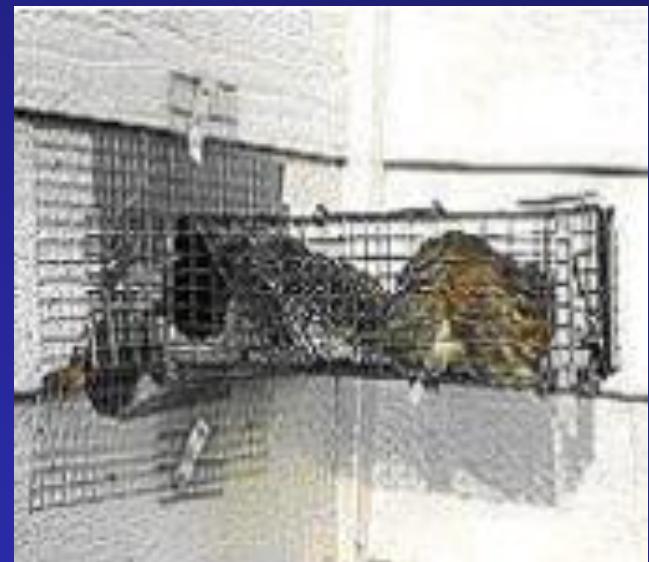
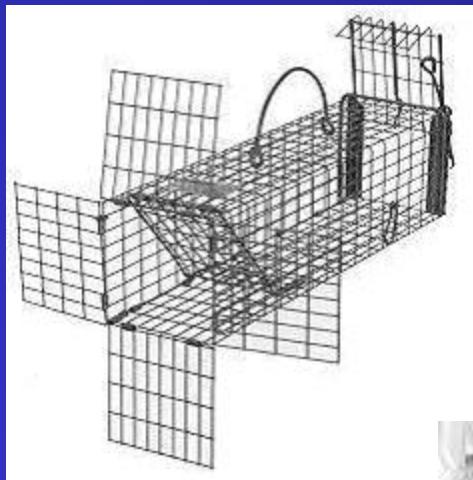
# Cage traps



# Cage Trap



# One way traps



# Tunnel traps



# Conibear #110



# Control Options—Shooting

- Shooting can be effective for controlling ground squirrels although it is labor intensive.
- Lead bullets are no longer allowed in California Condor range, soon to be entire state.



# Control Options - Other Strategies



Gas explosive device

# Endangered Species

Sources for info.

- Ag. Comm. - County Bulletins
- CA Dept. Fish and Wildlife – CNDDB
- CA Dept Pesticide Regulation - PRESCRIBE

# CA Natural Diversity Database

California Natural Diversity Database Home - Mozilla Firefox

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cnndb - Yahoo! Search Results California Natural Diversity Database ...

www.dfg.ca.gov/biogeodata/cnndb/ wedding

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## California Natural Diversity Database

The California Natural Diversity Database (CNNDDB) is a program that inventories the status and locations of rare plants and animals in California. CNNDDB staff work with partners to maintain current lists of rare species as well as maintain an ever-growing database of GIS-mapped locations for these species.

[What is the CNNDDB?](#) Additional information about CNNDDB.

[CNNDDB Key Facts](#) [PDF] An important document to read prior to working with the CNNDDB data.

[Maps & Data](#) Online Map Viewers, RareFind, and other products.

[Plant & Animal Information](#) Rare lists, T&E lists, survey guidelines, photos and more.

[Submitting Data to CNNDDB](#) Detailed instructions on submitting data to the CNNDDB.

[Subscribe to the CNNDDB](#) Subscription information.

[CNNDDB Training](#) Training course information.

[Natural Communities and Vegetation](#) Vegetation Classification and Mapping Program

### CNNDDB NEWSLETTERS

» January 2011  
» September 2010  
» January 2010  
» December 2008  
» February 2007  
» October 2006  
» June 2005  
» March 2004  
» Oct./Nov. 2003  
» Aug./Sept. 2003

### CNNDDB Links

» CNNDDB Quick Viewer  
» CNNDDB and Spotted Owl Data Viewer  
» RareFind 3  
» RareFind 4  
» CNNDDB Training  
» Monthly CNNDDB Data

Get Adobe Reader

Department of Fish & Wildlife  
Biogeographic Data Branch  
1807 13th Street, Suite 202  
Sacramento, CA 95811

### Questions about the CNNDDB?

**CNNDDB Coordinator**

Lead Scientist	Roxanne Bittman	916-323-8970
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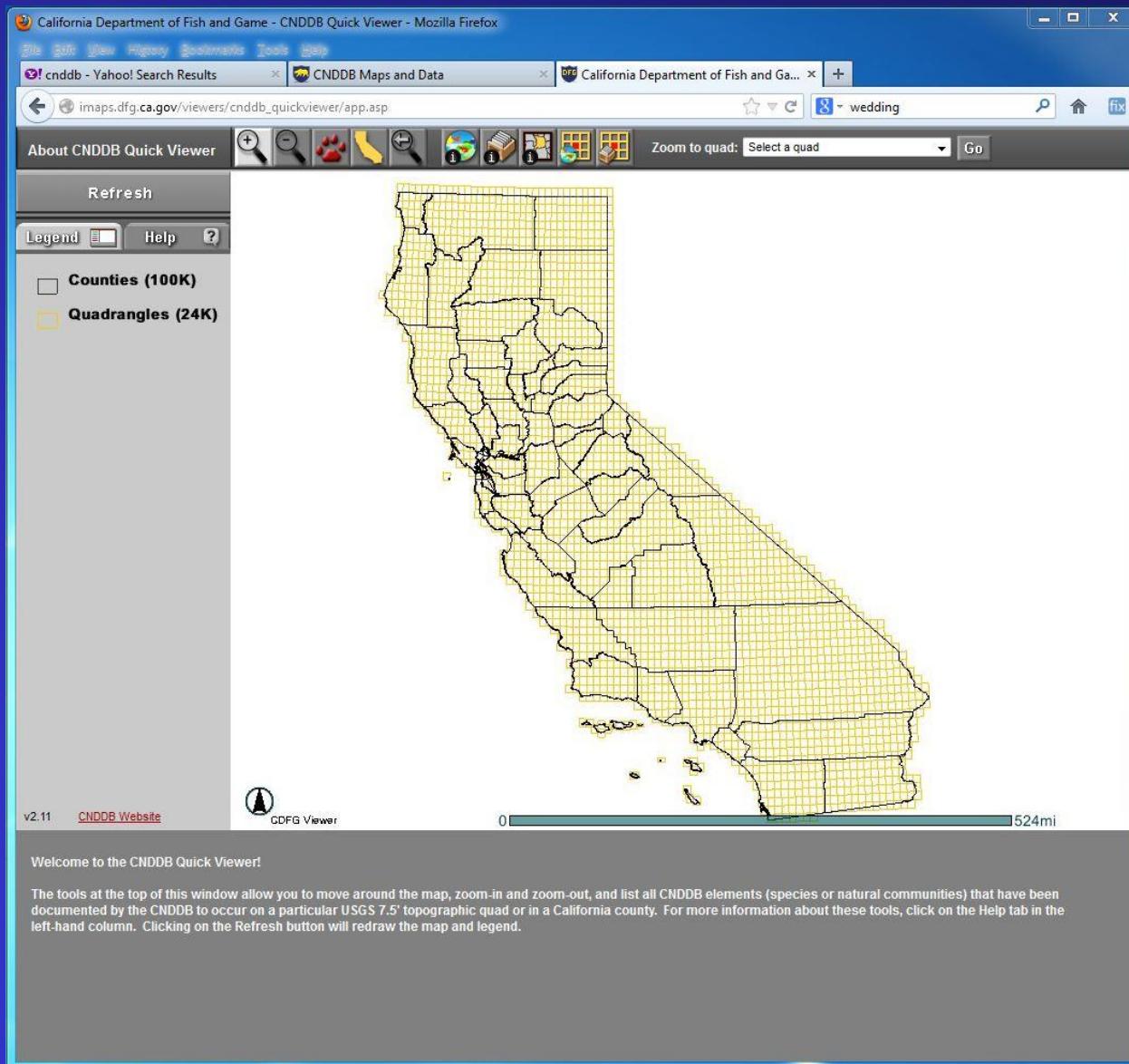
**Botany:**

Lead Botanist	Kristi Lazar	916-327-6292
Botanist	Ryan Elliott	916-327-0715

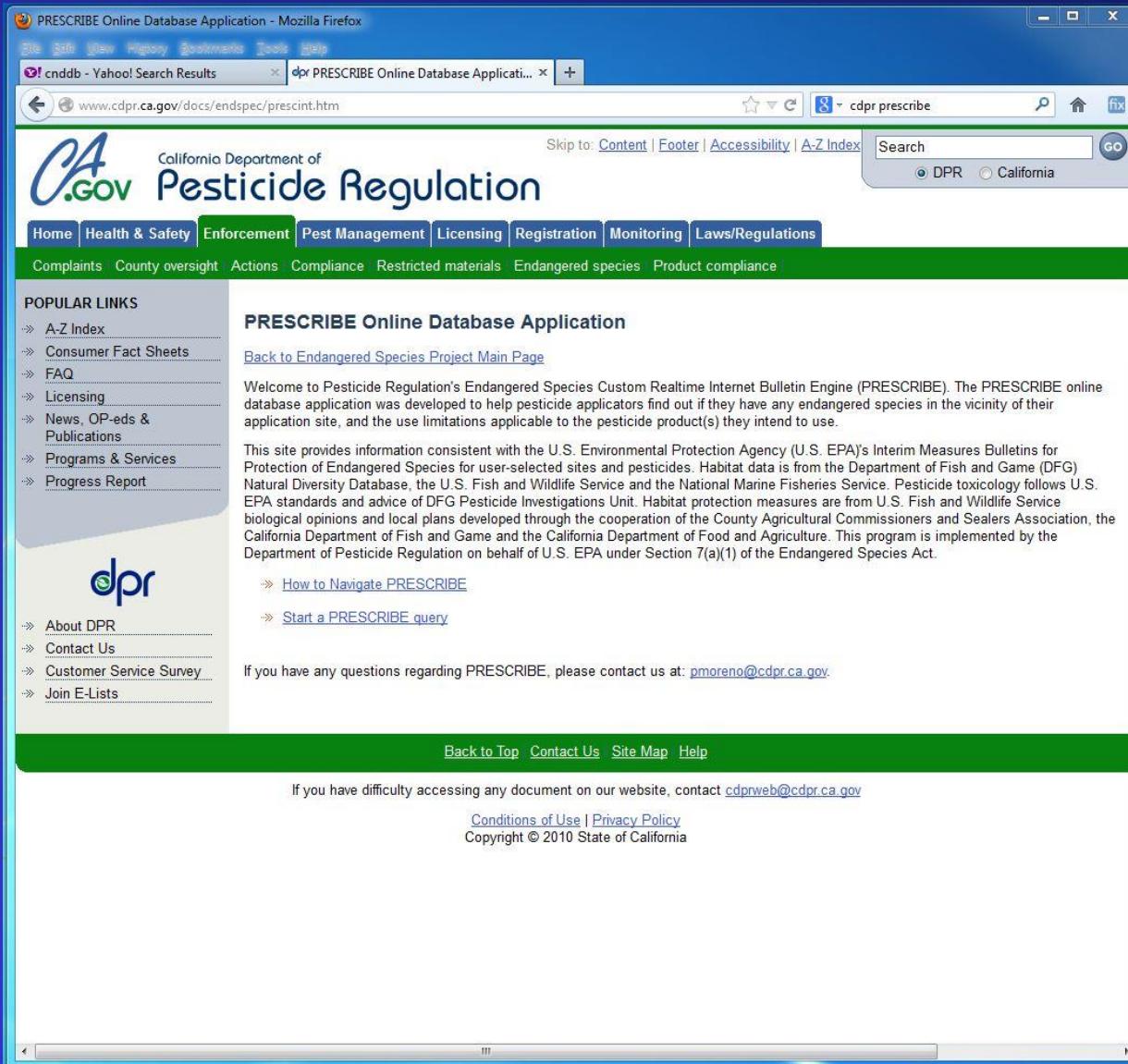
**Zoology:**

Lead Zoologist	Brian Acord	916-322-7307
Zoologist	Annie Chang	916-323-0449

# CA Natural Diversity Database



# CDPR PRESCRIBE



The screenshot shows a Mozilla Firefox browser window with the following details:

- Address Bar:** www.cdpr.ca.gov/docs/endspec/prescint.htm
- Title Bar:** PRESCRIBE Online Database Application - Mozilla Firefox
- Page Content:**
  - Header:** California Department of Pesticide Regulation (with CA.GOV logo)
  - Navigation:** Home, Health & Safety, Enforcement, Pest Management, Licensing, Registration, Monitoring, Laws/Regulations, Complaints, County oversight, Actions, Compliance, Restricted materials, Endangered species, Product compliance
  - Popular Links:** A-Z Index, Consumer Fact Sheets, FAQ, Licensing, News, OP-eds & Publications, Programs & Services, Progress Report
  - Section:** PRESCRIBE Online Database Application
  - Text:** Welcome to Pesticide Regulation's Endangered Species Custom Realtime Internet Bulletin Engine (PRESCRIBE). The PRESCRIBE online database application was developed to help pesticide applicators find out if they have any endangered species in the vicinity of their application site, and the use limitations applicable to the pesticide product(s) they intend to use.
  - Links:** How to Navigate PRESCRIBE, Start a PRESCRIBE query
  - Contact:** If you have any questions regarding PRESCRIBE, please contact us at: [pmoreno@cdpr.ca.gov](mailto:pmoreno@cdpr.ca.gov)
  - Footer:** Back to Top, Contact Us, Site Map, Help
  - Page Bottom:** If you have difficulty accessing any document on our website, contact [cdprweb@cdpr.ca.gov](mailto:cdprweb@cdpr.ca.gov)  
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# CDPR PRESCRIBE

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calpip.cdpr.ca.gov/county.cfm

cdpr prescribe

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 California Department of Pesticide Regulation

Home Health & Safety Enforcement Pest Management Licensing Registration Monitoring Laws/Regulations

» CalPIP Home

» My Selections

DATA SOURCE: PRESCRIBE

Endangered Species Bulletin

Location: County, MTRS, Zip Code

Product: Name Search

Help

**CALIFORNIA PESTICIDE INFORMATION PORTAL (CALPIP)**

**Endangered Species Custom Bulletin**

**Select County**

[About PRESCRIBE \(Endangered Species Bulletin\)](#)

**Step 1. Select County**

To begin, select a county where your pesticide use will occur then click on the Select button.

**Available Counties(58):**

- 01 ALAMEDA
- 02 ALPINE
- 03 AMADOR
- 04 BUTTE
- 05 CALAVERAS
- ... CALIFORNIA

NOTE: You must specifically select one or more county(s) before making a Meridian/Township/Range/Section ([MTRS](#)) selection.

Select

**Counties Selected (0):**

Default  
All potential counties

Unselect Unselect All

To continue, click on Next.

Next Reset Start Over

Version 2011.12 (2010 PUR Data Update)

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