

Vertebrate Pest Control

David Kratville

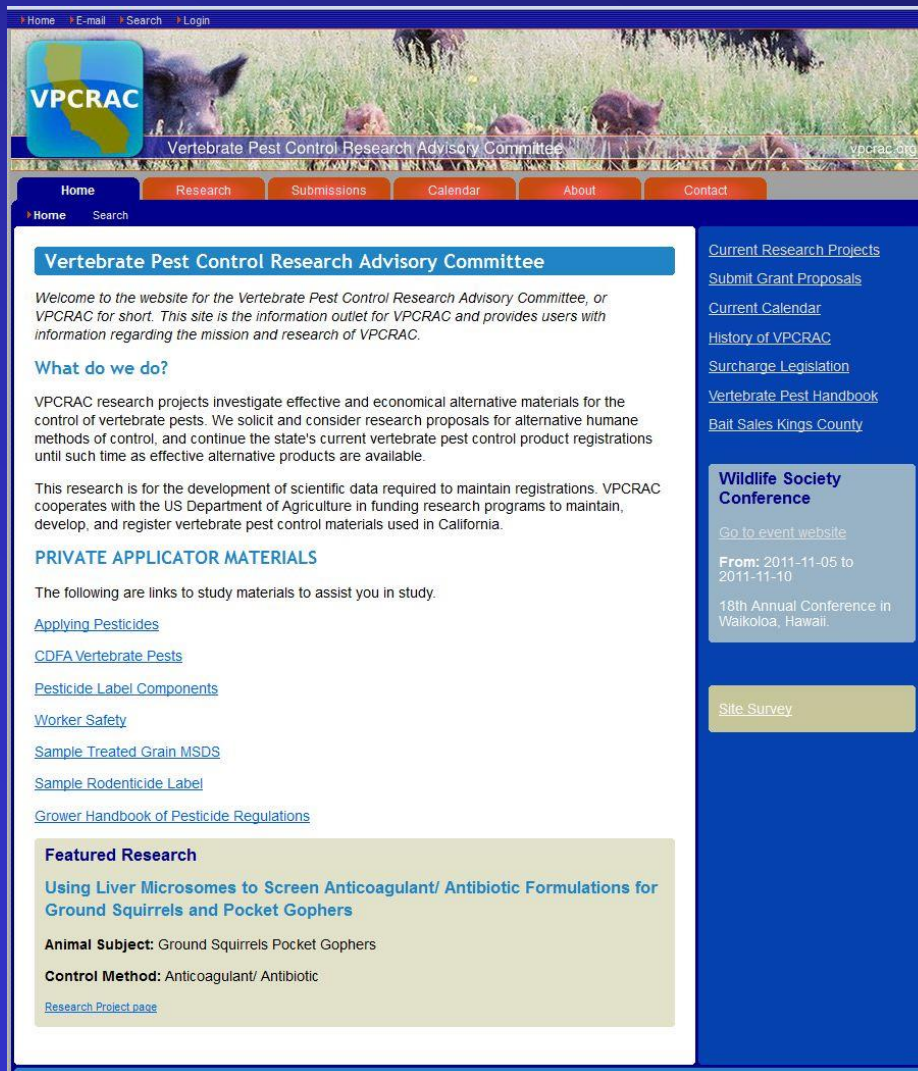
Senior Environmental Scientist

**California Department of
Food and Agriculture**

Vertebrate Pests



Vertebrate Pest Control Research Advisory Committee



Home | E-mail | Search | Login

VPCRAC
Vertebrate Pest Control Research Advisory Committee

Home | Research | Submissions | Calendar | About | Contact

Home Search

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](#)

[Current Research Projects](#)

[Submit Grant Proposals](#)

[Current Calendar](#)

[History of VPCRAC](#)

[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](#)

Vertebrate Pest Handbook

The Vertebrate Pest Control Handbook online

Current CDFA Rodenticide Labels:

- CDFA Anticoagulant Labels - Chlorophacinone

[Rodent Bait Chlorophacinone Treated Artichoke Bracts \(0.01%\)](#)

[Rodent Bait Chlorophacinone Treated Grain \(0.01%\)](#)

[Rodent Bait Chlorophacinone Treated Grain \(0.005%\)](#)

- CDFA Anticoagulant Labels - Diphacinone

[Rodent Bait Diphacinone Treated Grain \(0.01%\)](#)

[Rodent Bait Diphacinone Treated Grain \(0.005%\)](#)

[Rodent Bait Diphacinone Bait Block \(0.005%\)](#)

- CDFA Zinc Phosphide Labels

[Rodent Bait Zinc Phosphide Treated Grain \(2.0%\)](#)

[Chapter 1 Laws and Regulations](#)

[Chapter 2 Toxicants and Fumigants](#)

[Chapter 3 The Role of Wildlife in Spreading Diseases \(Revised\)](#)

[Chapter 4 Mammals, Introduction and Baiting Guidelines Part 1](#)

[Bats](#)

[Chipmunks](#)

[Cotton Rat](#)

[Coyote](#)

[Deer Mice \(Revised\)](#)

[Chapter 4 Mammals Part 2](#)

[Golden Mantled Ground Squirrel](#)

[California Ground Squirrel](#)

[Pocket Gophers](#)

[House Mice](#)

[Chapter 4 Mammals Part 3](#)

BIOLOGY, LEGAL STATUS, CONTROL MATERIALS, AND DIRECTIONS FOR USE

Ground Squirrels

Spermophilus beecheyi and its subspecies: Beechey, Douglas, Fisher, Sierra, Juarez, and Lesser California Ground Squirrel
S. beecheyi beecheyi, Belding Ground Squirrel, and
S. beecheyi oregonus, Oregon Ground Squirrel
Family: Sciuridae



Introduction: The California ground squirrel, *Spermophilus beecheyi*, is one of the most troublesome pests to California agriculture, homeowners and gardeners. It is found in nearly all regions of California, except for the Owens Valley southward into the desert regions. The Belding ground squirrel is a major pest in alfalfa and pasture areas in California's northeast.



Identification: Ground squirrels are easily identified as they forage aboveground near their burrows. The ground squirrel's body measures 9 to 11 inches. Its semi-bushy tail adds another 5 to 9 inches. The fur is brownish gray and speckled with off-white along the back; the sides of the head and shoulders are light gray to whitish. One subspecies that occupies most of northern California has a dark, triangular-shaped patch on its back between the shoulders; this patch is missing from other species. While ground squirrels are similar in appearance to tree squirrels and may climb trees, when frightened they will always retreat to a burrow, whereas tree squirrels will climb a tree or tall structure and never use a burrow.



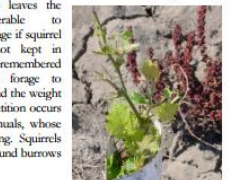
Legal Status: Ground squirrels are classified as nongame mammals by the

are found to be injuring growing crops or the owner or tenant of the premises. They are regulated by the Department of Food and Agriculture or by federal or state agencies pursuant to the provisions of the Food and Agricultural Act of 1960.

regulated by the California Department of Fish and Game, the San Joaquin antelope squirrel, and the San Joaquin antelope squirrel, all within the range of these threatened species.

nuts including almonds, apples, apricots, peaches, and walnuts. Certain vegetables and cotton are taken at the seedling stage, and other crops are damaged by gnawing of the roots.

amount of green plant growth is reduced in daily weight by 0.5 and 0.75 lbs. per acre. Based on the findings of the United and Dixon (1960), ground squirrels eat as much as 200 squirrels eat as much as one steer. The damage presented here might not be felt by the rancher in years of adequate rainfall, the difficulty in predicting



drought conditions leaves the stockmen vulnerable to competition for forage if squirrel populations are not kept in check. It should be remembered that the loss of forage to squirrels goes beyond the weight of green matter they consume. The most important competition occurs when squirrels feed on the tender young sprouts of annuals, whose growth may be retarded or stopped altogether by close grazing. Squirrels also eliminate vegetation by cleaning and trampling areas around burrows and runways.

The threat of seepage or collapse of levees and ditch banks requires the elimination or control of these burrowing rodents where they inhabit such structures. Permanent exclusion of squirrels is possible by such devices as concrete linings, but the expense is usually prohibitive. Other areas where ground squirrel burrowing is unacceptable include golf courses, railroad rights-of-way, horse pastures and cemeteries.

CDFA Rodenticide Surcharge

Surcharge of \$.50 per pound for all vertebrate pest control products sold, distributed or applied by County Agricultural Commissioners offices.

Program averages \$500,000 per year.

2014 surcharge was down to \$329,397

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

Current Research

- Strychnine replacement for Gopher control
- Sequential exposures to first and second generation anticoagulants
- Zinc phosphide treated cabbage
- Owl box efficacy
- Wild pig habitat use

AB 751, Vertebrate Pest Research

Signed by Gov. Brown Sep. 30, 2015

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS
FOLLOWS:

SECTION 1.

Section 6029 of the Food and Agricultural Code is amended to read:

6029.

Except as specified in Section 6025.4, this article shall remain in effect only **until January 1, 2026**, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2026, deletes or extends that date.

Recent Vertebrate Pest Control Legislation



DPR 2nd 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

Rodenticide Registration Review

January 2016

Chlorophacinone, Diphacinone and Warfarin

II. Authority

EPA is initiating its review of the pesticides identified in this document pursuant to section 3(g) of the **Federal Insecticide, Fungicide, and Rodenticide Act** (FIFRA) (7 U.S.C. 136a(g)) and the Procedural Regulations for Registration Review at 40 CFR part 155, subpart C. Section 3(g) of FIFRA provides, among other things, that the **registrations of pesticides are to be reviewed every 15 years**. Under FIFRA, a pesticide product may be registered, or remain registered only if it meets the statutory standard for registration given in FIFRA section 3(c)(5) (7 U.S.C. 136a(c)(5)). When used in accordance with widespread and commonly recognized practice, the pesticide product must perform its intended function without unreasonable adverse effects on the environment; that is, without any unreasonable risk to man or the environment, or a human dietary risk from residues that result from the use of a pesticide in or on food.

AB 2657, Bloom. Anticoagulants PASSED 2014

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

AB 2596, Bloom. Anticoagulants

Introduced Feb. 2016

- California Natural Predator Protection Act
- Prohibits the use of all anticoagulants statewide, production agriculture excluded.
- Protect native predators from secondary poisonings
- Rely on native predators to control rodents.

CPDR Memo June 27, 2013

SECOND GENERATION ANTICOAGULANT RODENTICIDE ASSESSMENT

Table 1. Half-life (in days) of a single dose of rodenticides in the blood and liver of rats^{1, 2}

Class of Rodenticide	Rodenticide	Dose (mg ai/kg)	Half-life (in days) in Blood	Half-life (in days) in Liver
Second Generation Anticoagulant Rodenticides	Brodifacoum	0.02 to 0.35	6.5 to 91.7 ⁷	113.5 ³ to 350
	Bromadiolone	0.2 to 3.0	1.0 to 2.4	170 to 318
	Difenacoum ⁴	1.2	NA	118
	Difethialone	0.5	2.3	126
First Generation Anticoagulant Rodenticides	Chlorophacinone	4 to 5	0.4	Less than 2
	Diphacinone	0.32	NA	Between 2 and 3 ^{1, 3}
	Warfarin	NA ⁹ , 1 ³	0.7 to 1.2 ¹	7 ¹ to 26.2 ³
Non-anticoagulant Rodenticides ²	Bromethalin ⁵	NA ⁹	5.5	NA
	Cholecalciferol ⁶	NA ⁹	1	~19 ⁸

1 Data summarized from Erickson and Urban, 2004, except where noted.

2. Data is not available for zinc phosphide, so it is not included on the chart.

3. Fisher et al, 2003.

4. U.S. EPA, 2007.

5. Spaulding and Spanning, 1988.

6. Marrow, 2001.

7. Vandenbroucke et al, 2008.

8. Body half-life (instead of liver half-life).

9. NA is defined as Not Available.

CPDR Memo June 27, 2013

SECOND GENERATION ANTICOAGULANT RODENTICIDE ASSESSMENT

Table 2. Number (and percent) of the rodenticides among all animals (n=492) and among the positive animals (n=368)¹.

Total	Number	Second Generation Anticoagulant Rodenticides			First Generation Anticoagulant Rodenticides		
Samples	492	359 (72.9%)			65 (13.2%)		
Positives	368	359 (97.6%)			65 (17.7%)		
Total	Number	Brodifacoum	Bromadiolone	Difethialone	Chlorophacinone	Diphacinone	Warfarin
Birds	194	124 (63.94%)	42 (21.7%)	10 (5.2%)	1 (0.5%)	5 (0.3%)	0 (0.0%)
Mammals	298	215 (72.2%)	141 (47.3%)	31 (10.4%)	17 (5.7%)	48 (16.1%)	4 (1.3%)
Total	492	339 (68.9%)	183 (37.2%)	41 (8.3%)	18 (3.7%)	53 (10.8%)	4 (0.8%)
Positives	368	339 (92.1%)	183 (49.7%)	41 (11.1%)	18 (4.9%)	53 (14.4%)	4 (1.1%)

1. Animals may be positive for more than one rodenticide.

CPDR Memo June 27, 2013

SECOND GENERATION ANTICOAGULANT RODENTICIDE ASSESSMENT

Table 14. A comparison of the average per year (2006 to 2010) of rodenticides sold (in pounds a.i.) to the average per year (2006 to 2010) of pounds of rodenticides reported used (PUR) (in pounds a.i.) to an estimated pounds of use of rodenticides by non-licensed personnel (calculated by subtracting the PUR from the total sold).

Type of Rodenticide	Rodenticide	Total Sold ¹ (lbs. of a.i. (%))	PUR ² (lbs. of a.i. (%))	Estimated Non-licensed Use ³ (lbs. of a.i. (%))
Second Generation Anticoagulant Rodenticides	Brodifacoum	26.58 (6.54%)	3.07 (2.66%)	23.51 (8.09%)
	Bromadiolone	51.02 (12.56%)	32.48 (28.10%)	18.54 (6.38%)
	Difencoum ⁴	0.25 (0.06%)	0.015 (0.01%)	0.235 (0.08%)
	Difethialone	4.49 (1.1%)	3.64 (3.15%)	0.85 (0.29%)
First Generation Anticoagulant Rodenticides	Chlorophacinone	66.54 (16.38%)	17.42 (15.07%)	49.12 (16.79%)
	Diphacinone	226.99 (55.9%)	56.70 (49.05%)	170.29 (58.57%)
	Warfarin	30.44 (7.49%)	2.27 (1.96%)	28.17 (9.69%)
Total Rodenticides		406.32 (100.00%)	115.595 (100.00%)	270.485 (100.00%)

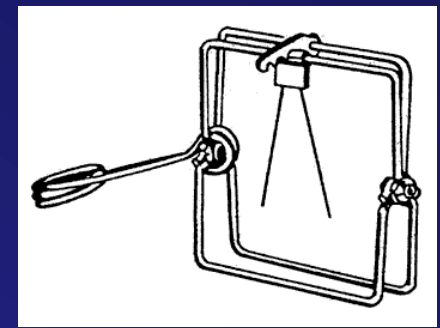
1. From the Mill Assessment Database.
2. From the PUR database. The PUR includes pesticide applications on parks, golf courses, pastures, structural pest control, landscape maintenance, roadsides/right of ways, and crops, and all pesticide applications made by licensed applicators.
3. Calculated by subtracting the "PUR" Use from the Total Sold. Estimates the rodenticides applied by non-licensed applicators (i.e., homeowners, building and maintenance workers, custodians).
4. Two (2) year (2009 and 2010) average.

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 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.



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. (FGC ban Aug '15)**
- Fees passed on to trappers
- Depredation trapping is excluded.

AB 290, Bigelow, Wild Pig Depredation Re-referred to Committee

- Prohibit release of pigs into uncontrolled areas
- Remove DFW Management Plan
- License sales fund remediate damage
- Authorize taking at night with prior notification
- Replace tags with license validation which allows unlimited take

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 January 20, 2016 Sacramento, 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
Voies	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. Vitamin K antidote.
- Widely used for the control of commensal and field rodents.
- Can be separated into two distinct groups:
 - first generation anticoagulants
(warfarin, chlorophacinone, diphacinone)
 - second generation anticoagulants (brodifacoum, bromadiolone, difenacoum, difethialone)

1st Generation Anticoagulants

- Warfarin, the first anticoagulant rodenticide, discovered in 1943.
- The first generation anticoagulants are chronic in their action.
- Multiple feedings over several days. 7-10 days until death

2nd Generation Anticoagulants

- Genetically linked resistance in rats and mice to 1st generation anticoagulants.
- Research led to the development and marketing of brodifacoum, bromadiolone, difethialone, and difenacoum.
- Acutely toxic to rodents.
- Single feeding results in a toxic dose. 7-10 days until death.

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.

Acute Toxicants

- **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.
- **Bromethalin** – Neurotoxin for control of rats and mice. No diagnostic tests for secondary poisonings. No antidote. Increased use with restrictions on anticoagulants.

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.



“Home” use diphacinone for Ground Squirrel

Kaput

GROUND SQUIRREL BAIT

This product may only be used within 100 feet of buildings to control California Ground Squirrels

KILLS CALIFORNIA GROUND SQUIRRELS AND THEIR FLEAS



NET WT. 5 LBS. (2.26 kg)


EPA Reg. No. 72500-24 EPA Est. 72500-CO-1

ACTIVE INGREDIENTS:
 Diphacinone (CAS No. 82-66-6) 0.0025%
 Imidacloprid (CAS Number 138261-41-3) 0.0250%

OTHER INGREDIENTS 99.9725%
TOTAL 100.0000%

**KEEP OUT OF REACH OF CHILDREN
CAUTION
HARMFUL IF SWALLOWED.**

SEE BACK PANEL FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS.



GROUND SQUIRREL BAIT BY WILCO

PRECAUTIONARY STATEMENTS
 HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION: Harmful if swallowed or absorbed through the skin. Causes moderate eye irritation. Keep away from humans, domestic animals, and pets.

PERSONAL PROTECTIVE EQUIPMENT (PPE)
 All handlers (including applicators) must wear long-sleeved shirt, long pants, shoes, socks, and waterproof gloves. Any person who removes carcasses or unused bait following application of this product must wear waterproof gloves.

USER SAFETY REQUIREMENTS
 Follow manufacturer's instruction for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash hands thoroughly after applying bait and before eating, drinking, chewing gum, using tobacco or using the toilet and change into clean clothing.

ENVIRONMENTAL HAZARDS
 This product is extremely toxic to mammals and birds. Dogs, cats and other predatory and scavenging mammals and birds might be poisoned if they feed upon animals that have eaten the bait. Do not apply directly to water, or to areas where surface water is present or to littoral areas below the mean high water mark. Do not contaminate water when disposing of equipment wash water or residue.

STORAGE AND DISPOSAL
 Do not contaminate water, food or feed by storage or disposal.
PESTICIDE STORAGE: Store only in original closed container in a cool, dry place inaccessible to children and pets. Keep containers closed and away from other chemicals. Sweep up spillage carefully and dispose of as indicated below.

PESTICIDE DISPOSAL:
 Wastes resulting from the use of this product, may be disposed of at an office or at an approved waste disposal facility.

CONTAINER DISPOSAL: Nonrefillable container. DO NOT REUSE OR REFILL THIS CONTAINER (Plastic) Other for recycling or reconditioning; or puncture and dispose of in a sanitary landfill.

NOTICE: Seller makes no warranty, expressed or implied, concerning the use of this product other than indicated on the label. Buyer assumes all risk of use and/or handling of this material when such use and/or handling is contrary to label instructions.

KEEP AWAY FROM FEED AND FOODSTUFFS
WILCO DISTRIBUTORS, INC.
 P O BOX 291 • LOMPOC CA 93438
 PH# 805-735-2476
NET WT. 4 LBS.
 EPA ESTB. NO.: 36029-CA-01
 EPA REG. NO.: 36029-20

UPC
 0 91017 31004 6

220313

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its label(s).

READ THIS LABEL: Read this entire label and follow all use directions and use precautions. Use only for the sites, pests, and application directions described on this label.

IMPORTANT: Do not expose children, pets, or other nontarget animals to rodenticides. To help prevent accidents:

1. Store product not in use in a location out of reach of children, pets, and livestock.
2. Apply this product in secured, tamper-resistant bait stations, (like Wilco Ground Squirrel Bait Stations). These stations must be resistant to destruction by dogs and by children under six years of age, and must be constructed and used in ways which prevent such children from reaching into bait compartments and obtaining bait. Stations must be secured so that they cannot be overturned by young children, pets, or winds. Stations used in areas open to livestock and/or nontarget wildlife must be secured so that the units cannot be readily overturned by any nontarget animals that have access to them.
3. Dispose of product container, and unused, spoiled, and uncontaminated bait as specified on this label.

USE RESTRICTIONS: For use only around buildings (including yards and flower gardens) in secured, tamper-resistant bait stations (like Wilco Ground Squirrel Bait Stations) to control the California Ground Squirrel (*Spermophilus beecheyi*) and Townsend Ground Squirrel (*Spermophilus townsendi*) in California, Nevada, Oregon, Washington, Idaho, and New Mexico, Utah only.

Do not apply this product by any method not specified on this label. This product may not be broadcast. Do not sell this product in individual containers holding less than 4 pounds of bait.

APPLICATION DIRECTIONS: Secure bait stations at locations where they will be readily accessible to target ground squirrels, preferably near active burrows. Secure stations 20 to 100 feet apart, depending upon density of the population. Wear waterproof gloves and scooping device (preferably long-handled) to transfer bait from the container to the station. Use 2 to 4 pounds of bait per bait station. Check bait stations frequently to insure that an uninterrupted supply of bait is always available for at least 15 days or until signs of feeding have stopped.

POST-APPLICATION DIRECTIONS:
 Wearing waterproof gloves, collect and bury dead rodents. Dispose of leftover bait according to "Pesticide Disposal". With detergent and hot water, wash all implements used for applying bait. Do not use these implements for mixing, holding, or transferring foods or feed.

This product may only be used within 50 feet of buildings to control California and Townsend Ground Squirrels in California, Nevada, Oregon, Washington, Idaho, Arizona, New Mexico and Utah only. Ground Squirrel Bait by Wilco is actually impregnated by the toxicant.

Active ingredient:
 Diphacinone (CAS# 82666) 0.005%
 Other ingredients 99.995%
 Total 100.00%

**KEEP OUT OF REACH OF CHILDREN
CAUTION
FIRST AID**

Have label with you when obtaining treatment advice.

If swallowed:

- Call a poison control center, doctor or 1-800-358-7378 immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by a poison control center or doctor.

If on skin or clothing:

- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor immediately for treatment advice.

If in eyes:

- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eyes.
- Call a poison control center or doctor immediately for treatment advice.

TREATMENT FOR PET POISONING
 If animal eats bait, call a veterinarian or 1-800-222-1222 at once.
NOTE TO PHYSICIAN OR VETERINARIAN
 Contains the anticoagulant Diphacinone. If swallowed, this material may reduce the clotting ability of the blood and cause bleeding. For humans or animals ingesting bait and/or showing poisoning signs (bleeding or elevated prothrombin time), give vitamin K1 intramuscularly or orally.

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



Hand Baiting



Do not clump or pile bait!



Broadcast Baiting



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.



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.
- Fumigant Management Plan.

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.

****Utah 2010****

Control Options—Fumigation

Gas cartridges

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



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—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.

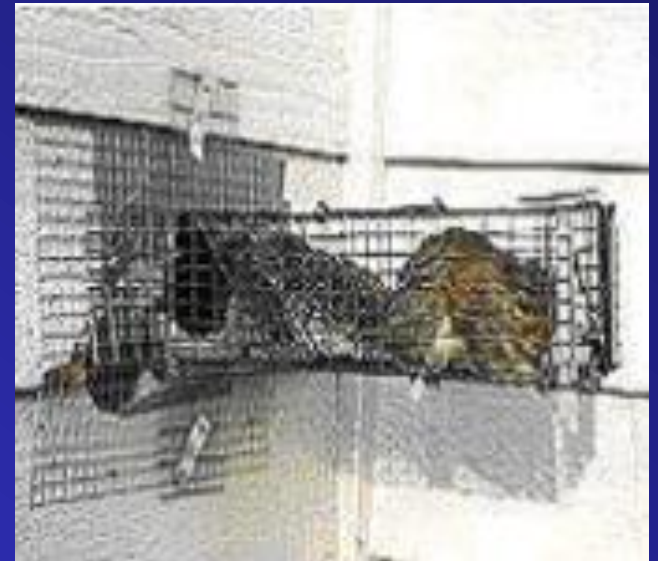
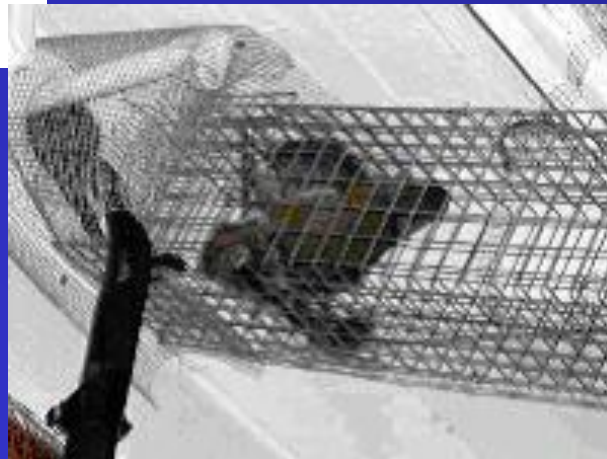
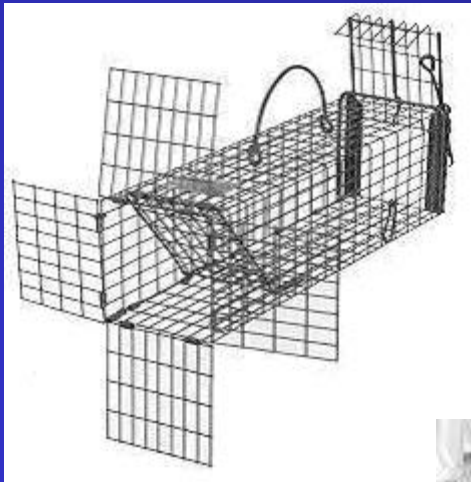
Cage traps



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 – CNDDDB
- CA Dept Pesticide Regulation - PRESCRIBE

CA Natural Diversity Database

The screenshot shows the California Natural Diversity Database (CNDDDB) website. The browser window title is "California Natural Diversity Database Home - Mozilla Firefox". The address bar shows "www.dfg.ca.gov/biogeodata/cnddb/". The website header includes the California Department of Fish and Wildlife logo and navigation links for Home, Recreation, Resource Management, Enforcement, Marine, Spills, Education, Science Institute, and Data & Maps. A search bar is located in the top right corner.

BDB PROGRAMS

- ACE-II
- BIOS
- Vegetation Classification and Mapping Program
- CNDDDB
- CWHR
- GIS Services
- Data Products
- Support
- About BDB
- Staff
- Partners

CNDDDB Links

- CNDDDB Quick Viewer
- CNDDDB and Spotted Owl Data Viewer
- RareFind 3
- RareFind 4
- CNDDDB Training
- Monthly CNDDDB Data

California Natural Diversity Database

The California Natural Diversity Database (CNDDDB) is a program that inventories the status and locations of rare plants and animals in California. CNDDDB 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 CNDDDB?
Additional information about CNDDDB.

CNDDDB Key Facts
[PDF] An important document to read prior to working with the CNDDDB 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 CNDDDB
Detailed instructions on submitting data to the CNDDDB.

Subscribe to the CNDDDB
Subscription information.

CNDDDB Training
Training course information.

Natural Communities and Vegetation
Vegetation Classification and Mapping Program

CNDDDB NEWSLETTERS

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

Questions about the CNDDDB?

CNDDDB Coordinator

Lead Scientist	Roxanne Bittman	916-323-8970
----------------	---------------------------------	--------------

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

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

CA Natural Diversity Database

California Department of Fish and Game - CNDDDB Quick Viewer - Mozilla Firefox

File Edit View History Bookmarks Tools Help

cnddb - Yahoo! Search Results CNDDDB Maps and Data California Department of Fish and Ga...

imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp wedding

About CNDDDB Quick Viewer Zoom to quad: Select a quad Go

Refresh

Legend Help ?

- Counties (100K)
- Quadrangles (24K)

v2.11 [CNDDDB Website](#) GDFG Viewer 0 524mi

Welcome to the CNDDDB Quick Viewer!

The tools at the top of this window allow you to move around the map, zoom-in and zoom-out, and list all CNDDDB elements (species or natural communities) that have been documented by the CNDDDB to occur on a particular USGS 7.5' topographic quad or in a California county. For more information about these tools, click on the Help tab in the left-hand column. Clicking on the Refresh button will redraw the map and legend.

CDPR PRESCRIBE

The screenshot shows a Mozilla Firefox browser window displaying the CDPR PRESCRIBE Online Database Application. The browser's address bar shows the URL www.cdpr.ca.gov/docs/endspec/prescint.htm. The page header features the California Department of Pesticide Regulation logo and navigation links for Content, Footer, Accessibility, and A-Z Index. A search bar is located in the top right corner, with radio buttons for 'DPR' and 'California'. Below the header is a green navigation bar with links for Home, Health & Safety, Enforcement, Pest Management, Licensing, Registration, Monitoring, and Laws/Regulations. A secondary navigation bar includes links for Complaints, County oversight, Actions, Compliance, Restricted materials, Endangered species, and Product compliance.

POPULAR LINKS

- » [A-Z Index](#)
- » [Consumer Fact Sheets](#)
- » [FAQ](#)
- » [Licensing](#)
- » [News, OP-eds & Publications](#)
- » [Programs & Services](#)
- » [Progress Report](#)

PRESCRIBE Online Database Application

[Back to Endangered Species Project Main Page](#)

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.

This site provides information consistent with the U.S. Environmental Protection Agency (U.S. EPA)'s Interim Measures Bulletins for Protection of Endangered Species for user-selected sites and pesticides. Habitat data is from the Department of Fish and Game (DFG) Natural Diversity Database, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Pesticide toxicology follows U.S. EPA standards and advice of DFG Pesticide Investigations Unit. Habitat protection measures are from U.S. Fish and Wildlife Service biological opinions and local plans developed through the cooperation of the County Agricultural Commissioners and Sealers Association, the California Department of Fish and Game and the California Department of Food and Agriculture. This program is implemented by the Department of Pesticide Regulation on behalf of U.S. EPA under Section 7(a)(1) of the Endangered Species Act.

- » [How to Navigate PRESCRIBE](#)
- » [Start a PRESCRIBE query](#)

If you have any questions regarding PRESCRIBE, please contact us at: pmoreno@cdpr.ca.gov.

[Back to Top](#) [Contact Us](#) [Site Map](#) [Help](#)

If you have difficulty accessing any document on our website, contact cdprweb@cdpr.ca.gov

[Conditions of Use](#) | [Privacy Policy](#)
Copyright © 2010 State of California

CDPR PRESCRIBE

California Pesticide Information Portal - Mozilla Firefox

California Pesticide Information Portal

calpip.cdpr.ca.gov/county.cfm

Skip to: [Content](#) | [Footer](#) | [Accessibility](#) | [A-Z Index](#)

CA.gov 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

Available Counties(58):

<input type="checkbox"/>	01 ALAMEDA
<input type="checkbox"/>	02 ALPINE
<input type="checkbox"/>	03 AMADOR
<input type="checkbox"/>	04 BUTTE
<input type="checkbox"/>	05 CALAVERAS
<input type="checkbox"/>	06 COLUSA

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

Counties Selected (0):
Default: All potential counties

To continue, click on Next.

Version 2011.12 (2010 PUR Data Update)

[Back to Top](#) [Contact Us](#) [Site Map](#) [Help](#)

If you have difficulty accessing any document on our website, contact cdprweb@cdpr.ca.gov

[Conditions of Use](#) | [Privacy Policy](#)
Copyright © 2010 State of California