

Vertebrate Pest Control

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Food and Agriculture**

Purpose of this training?

- Overview of Vertebrate Pest Control Research Advisory Committee, VPCRAC
- CDFA Rodenticides
- Anticoagulant Application
- Recent Rodenticide and Trapping Legislation
- Nutria in California

Vertebrate Pest Control Research Advisory Committee

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VPCRAC
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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 Control Research Advisory Committee

How is VPCRAC Funded?

In 1990, the Rodenticide Surcharge Program (Assembly Bill 2776) requested each agricultural commissioner to collect a fee or surcharge of 50 cents for each pound of vertebrate pest control material sold, distributed, or applied by the county.

On average \$500,000 per year is collected.

Food Ag Code sec. 6029, extended through Jan. 2026

Vertebrate Pest Control Research Advisory Committee

What does VPCRAC Fund?

The money generated by this surcharge is used to fund the research required by the EPA to maintain current registrations, payment of registration fees, to improve existing rodenticides, and to find new materials and methods to solve vertebrate pest problems.

To date over 130 VPCRAC funded vertebrate pest related studies have been completed.

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

Anticoagulants

Inhibit the formation of Vitamin K in the liver. Reduces blood's ability to clot.

Death occurs 7-10 days after feeding begins

1st Generation: Chronic, continuous feeding over several days required. Field use.

2nd Generation: Acute, single feeding incident is lethal. Commensal use (rats & mice) in and around homes or human structures.

Directions of Use

- **Do not** apply this product in or around homes or other human residences.
- **Do not** apply this bait at sites or to control pests not indicated on this label.
- **Do not** apply this product by application methods that are not specified on this label.
- **Do not** pile bait.
- **Do not** graze livestock or plant food or feed crops in spot-treated areas while bait is present. Applications in vineyards, orchards, and groves may only be made after harvest and during the dormant period and may not be made after tree and vine growth resumes in the spring.

Hand Baiting



Do not clump or pile bait!



Directions of Use

Apply baits in locations out of reach of **children, pets, and domestic animals**. If this is not possible, baits shall be used only in tamper-resistant bait stations that are resistant to destruction by dogs, wildlife, domestic animals, and children under six years of age.

FOLLOW-UP OPERATIONS – All Rodenticide Baits

Collect dead rodents and dispose of them by deep burying, burning (if permitted in your County or community), or double plastic bagging or by wrapping in newspaper and discarding in the trash. Wear disposable plastic gloves or other suitable hand protection if you must pick up carcasses by hand.

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

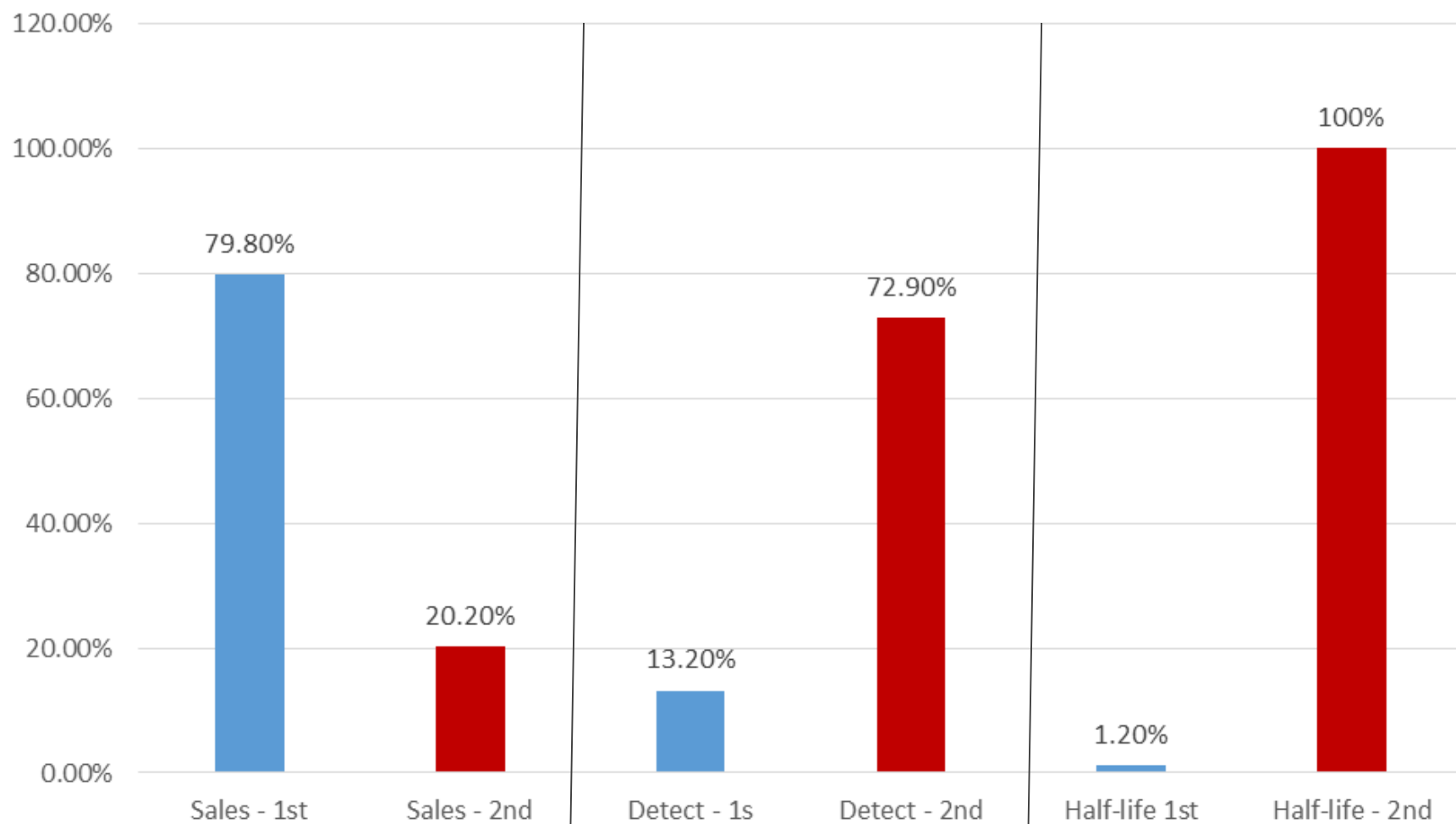
SECOND GENERATION ANTICOAGULANT RODENTICIDE ASSESSMENT

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.

Sales, Detections and Half-life 1st vs. 2nd Generation Anticoagulants



BAIT STATION APPLICATIONS – Diphacinone .005%

- It may take several days or longer for target animals to become accustomed to a bait station and to begin to accept bait from it.
- Maintain an uninterrupted supply of bait in the bait stations for as long as target species are taking bait, which often will last from 1 to 4 weeks after feeding begins.
- Check stations one or more times per week and replace consumed, spoiled or contaminated bait. Properly dispose of bait that is removed from bait stations or is spilled or scattered from bait stations.

CALIFORNIA GROUND SQUIRRELS

Diphacinone .005%

- **BAIT STATION BAITING:** Secure tamper-resistant bait stations near active ground squirrel burrows or runways. Place stations at intervals of 20 to 100 feet.
- Load 1-5 pounds of bait into bait station.
- Maintain uninterrupted supply, dispose of spoiled bait.

CALIFORNIA GROUND SQUIRRELS

Diphacinone .010%

- **SPOT BAITING:** Using a bait spoon, evenly scatter 1/3 cup (0.1 lb) of bait over 40 to 50 square feet near active squirrel burrows and runways.
- Do not place bait in piles. Using the same procedure, make a second application 4 days after the first.
- Do not apply more than 10 pounds of bait per acre per treatment.
- **Do Not** graze livestock or plant food or feed crops in spot-treated areas while bait is present. Applications in orchards, groves, and vineyards may only be made after harvest and during the dormant period and may not be made after tree and vine growth resumes in the spring

Recent Legislation

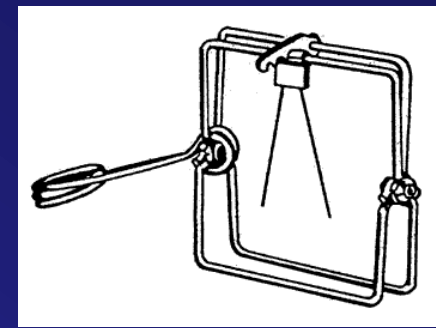
- AB 711 Hunting: nonlead ammunition
- AB 789 Trapping
- AB 2657 Anticoagulants
- SB 1332 Carbon Monoxide
- AB 2210 Nongame Animals
- AB 1126 Carbon Monoxide
- AB 1788 Use of Anticoagulants

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.
- 3) Phase 2** – Effective July 1, 2016, nonlead shot will be required when taking upland game birds with a shotgun, except for dove, quail, snipe, and any game birds taken on licensed game bird clubs. In addition, nonlead shot will be required when using a shotgun to take resident small game mammals, furbearing mammals, nongame mammals, nongame birds, and any wildlife for depredation purposes.
- 4) Phase 3** – Effective July 1, 2019, nonlead ammunition will be required when taking any wildlife with a firearm anywhere in California.

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.

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.

AB 1126, Ag. Comm. Carbon Monoxide Passed

Food and Ag Code 6025.4:

- ~~(b) This section shall become inoperative on January 1, 2018, and, as of January 1, 2018, is repealed, unless a later enacted statute, that becomes operative on or before January 1, 2018, deletes or extends the dates on which it becomes inoperative and is repealed.~~

Extends sunset date for Carbon monoxide use through 2023.

AB 1788, Bloom. Use of Anticoagulants Introduced Feb 2019

- *California Ecosystems Protection Act of 2019*
- Would prohibit use of: Brodifacoum, Bromadiolone, Bromethalin, Difenacoum, Difethialone (2nd Gen) statewide and Chlorophacinone Diphacinone and Warfarin (1st Gen.) on State owned property.
- This section does not apply to the use of pesticides for agricultural activities, as defined in Section 564.

Control Options – Carbon Monoxide



PERC Machine

Control Options – Carbon Monoxide



Burrow RX



Cheetah

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

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.

Ground Squirrel BMP's


<http://www.groundsquirrelbmp.com>



GROUND SQUIRREL **BMPs**

Biology Identification Management Regulations Resources FAQs Search

Ground squirrel management for California



Adult CA ground squirrel in Irvine

What are BMPs?

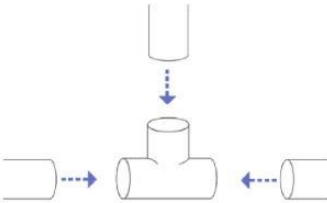
Best Management Practices (BMPs) are the most efficient, cost effective, and environmentally-friendly management methods that can achieve successful ground squirrel management

What is IPM?


Integrated Pest Management (IPM) is a multi-faceted, long-term approach to pest management that minimizes risks to people and the environment

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Adult activity												
Juvenile activity												
Skat												
Fungicide												
Toxic baits												
Trapping												
Burrow seal												
Shooting												
Habitat mod.												
Biological control												
Exclusion												

Timing and Efficacy



Step-by-Step Guides



Protecting Wildlife

Ground Squirrel BMP's



GROUND SQUIRREL **BMPs**

Biology

Identification

Management

Regulations

Resources

FAQs

Search



Biology

Where, when, what, why: ground squirrel biology plays a big role in management. Knowing when to expect seasonal changes in ground squirrel activity and food preferences can help make management efforts as efficient as possible.



Range and Habitat

Which regions and environments do ground squirrels inhabit in California?



Behavior and Diet

When are ground squirrels active, and what do they forage for?



Seasonal Activity

Adjust management schedules according to hibernation and mating periods.



Disease

Understand the human health risks associated with ground squirrels.

Ground Squirrel BMP's



GROUND SQUIRREL **BMPs**

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Identification

Management efforts are more effective when directed at the right pest. Identify which species of ground squirrel is causing damage - and make sure that another burrowing pest isn't responsible.



Signs and Characteristics

California or Belding's Ground Squirrels?
Learn how to tell the two species apart and how to recognize signs of activity.



Damage

See examples of ground squirrel damage to crops and infrastructure.



Look-alike Pests and Damage

Tree squirrels, gophers, and voles -- oh my.
Distinguish ground squirrels and their damage from other burrowing pests.



Non-pest Species

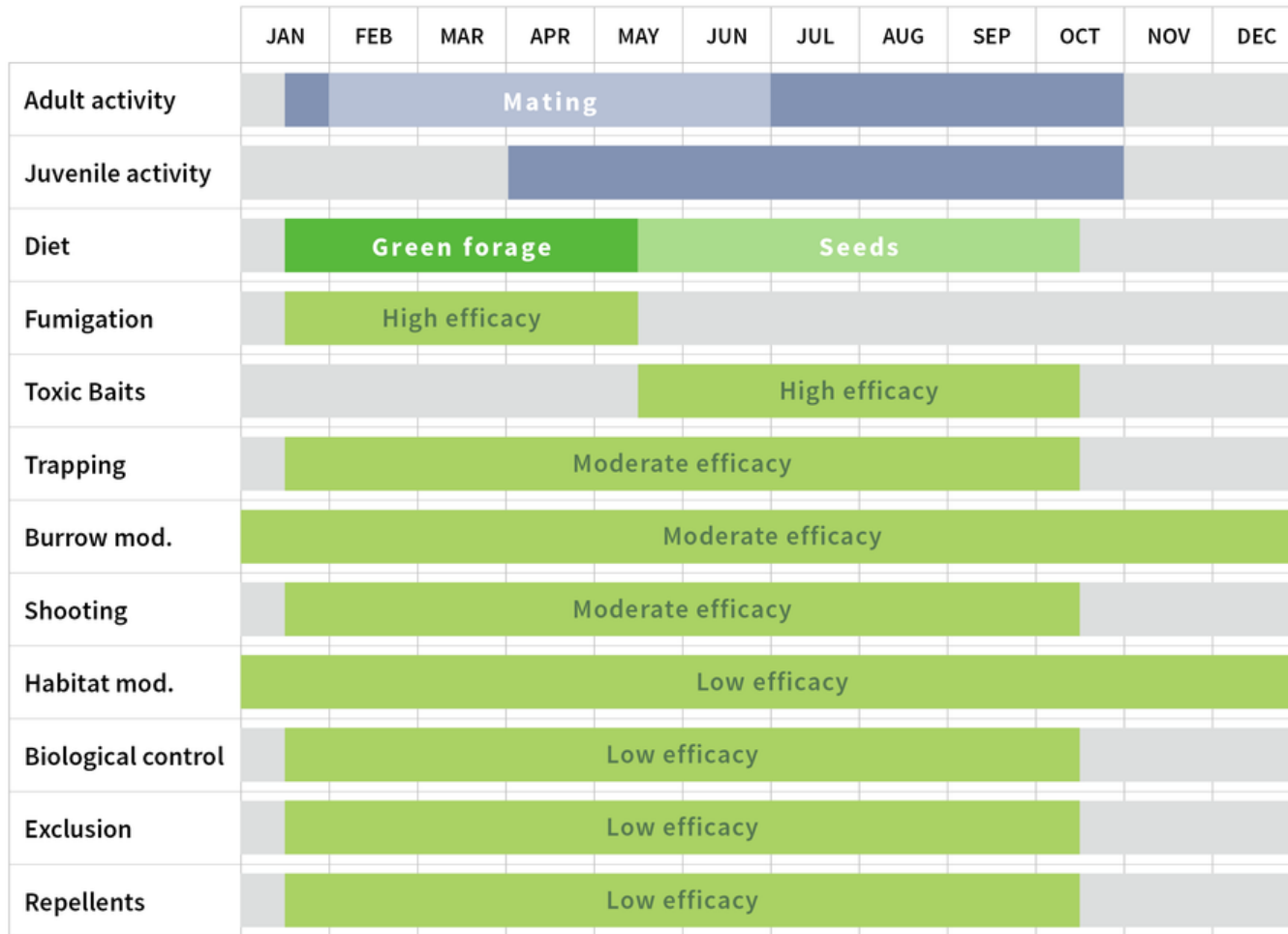
Learn about other burrowing species in California that do NOT cause damage:

- Burrowing Non-Target Wildlife
- Ground Squirrel Species of Lesser Concern

Signs and Characteristics photo: Jack Kelly Clark/UC IPM. Non-pest Species photo: Robert Sivinski.

Ground Squirrel BMP's

How to Time Management Efforts | California Ground Squirrels



■ Active
 ■ Feeding
 ■ Management window
 ■ Hibernation/Method ineffective

Note: Ground squirrel activity may vary by region. This variance may affect management windows.

Ground Squirrel BMP's



Biology

Identification

Management

Regulations

Resources

FAQs

Search



Behavior and Diet

Seasonal Activity

Disease

Construction

T-type bait stations only require basic tools to construct and are very easy to assemble. Below are step-by-step guides for construction of the traditional T-type bait station and two variations.

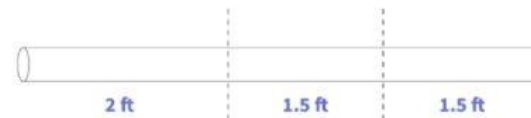
Jump to: [Traditional T-type](#) | [Modified T-type](#) | [T-type with Flow Restrictor](#)

Traditional T-type bait station

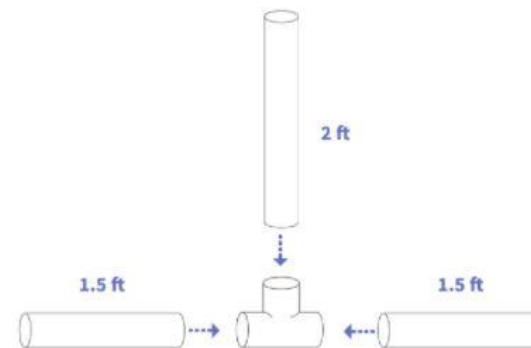
Materials

- Five feet of 4-inch PVC/NDS drainage pipe
- One T-junction
- Two 4-inch to 3-inch reducers
- One end cap
- PVC tape, PVC cement, or silicon glue
- Label

1. Cut the PVC pipe into one 2-foot section and two 1.5-foot sections.



2. Attach the T-junction to the 2-foot pipe.
3. Attach the two 1.5-foot sections into opposite ends of the T-junction.



[Download](#) these instructions in a PDF

Ground Squirrel BMP's



GROUND SQUIRREL **BMPs**

[Biology](#)

[Identification](#)

[Management](#)

[Regulations](#)

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Euthanasia

According to California Fish and Game Code, once a live animal is trapped, it must either be released where it was trapped or it must be euthanized. Animals can be euthanized by a shot to the head if it is legal to discharge a firearm in the trapped area. Drowning is not an acceptable method of euthanasia and it is illegal under California State law. Alternatively, ground squirrels can be euthanized by carbon dioxide; remember, it is illegal to use carbon monoxide for euthanasia of captured animals. Ground squirrels can be easily dispatched in euthanasia chambers. These can be commercially acquired from specialized vendors or assembled using few materials.

Assembling a chamber

It is not recommended to handle live ground squirrels. It is therefore a good idea to make sure that live traps can fit directly into the euthanasia chamber. This minimizes direct contact with the trapped squirrel and reduces injury to squirrel. In any case, a chamber at least twice the size of an adult ground squirrel is required. A portable insulated cooler with a drain hole is a suitable euthanasia chamber, for the chamber should not be airtight. Attach rubber tubing to the drain hole and then to a CO₂ tank with a flow regulator attached. A window that allows you to see inside the chamber can be very helpful. You can install a window in a cooler by using a jigsaw to drill an opening, cutting a custom piece of Plexiglas to fit, then attaching it to the cooler using epoxy.

Calculating CO₂ Flow

Humane euthanasia requires optimal CO₂ flow, which depends on the size of your euthanasia chamber. Finding the optimal flow for your chamber (approximately 10 to 30% of the chamber's volume per minute) takes just a few simple calculations, as demonstrated in the example below. Complete the calculations for CO₂ flow with the same units used by the flow regulator (cubic feet/hour or liters/minute).

1. Measure the euthanasia chamber's size in inches: **16 in × 17 in × 35 in**

See also:

- [Live Trapping](#)
- [Kill Trapping](#)

[Download](#) calculations for CO₂ flow as a PDF

Nutria, *Myocastor coypus*



- Native to South America
- Semiaquatic rodent, 15-20 lbs. distinct white whiskers
- Consume 1/3 their body weight per day, waste up to 90% of harvested plant mass
- Believed to be eradicated from CA in late 1960's
- CDFW, CDFA, State Parks, USDA Wildlife Services, USFWS
- CDFA A-rated Vertebrate Pest

MOST WOMEN think of the new sensation
 nutria — no wonder, its beauty and charm
 makes it the "blush" pride of possession.
 Whether you wish "sport-minded" appear-
 ance or for that delightful evening — always
 ask for CINDERELLA NUTRIA. It will suit the
 woman and the occasion.

FASHION'S nutria wrap has long influ-
 enced the desires and tastes of beautiful
 women. The new favorite for those who want
 the elegant, the beautiful, and the most
 desired possession. Nutria offers a collar
 for every occasion in ropes, shales, boleros,
 etc.


CINDERELLA
 NUTRIA

CINDERELLA
 NUTRIA

Failed fur market in the 1960's lead to widespread release of animals across United States. Established in Chesapeake, Mississippi Delta and Pacific Northwest



Feeding damage and eat-out




Normal Marsh

The image shows a wide, flat landscape. The top portion is a lush green field, representing a normal marsh. Below this, the ground is a mix of brown, cracked earth and shallow, blue-tinted water, representing a denuded marsh. A small, rectangular area of green grass is enclosed by a thin black line, representing an exclosure.

Denuded Marsh

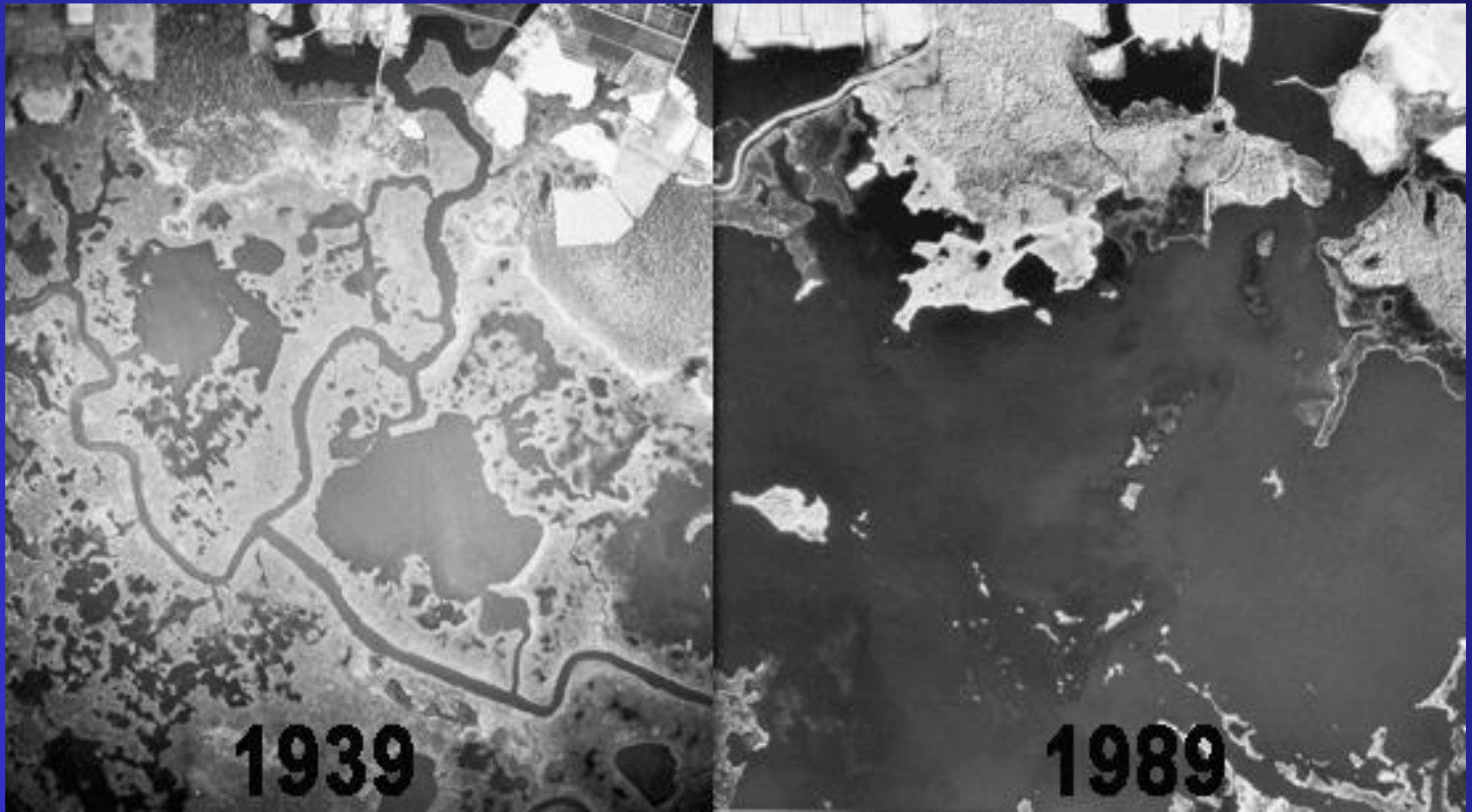
Exclosure



Closeup of an Exclosure

A close-up view of a rectangular exclosure. The exclosure is a small, fenced-in area containing a cluster of green grass. The fence is made of several vertical wooden posts. The surrounding ground is a mix of brown, cracked earth and shallow, blue-tinted water, representing a denuded marsh.

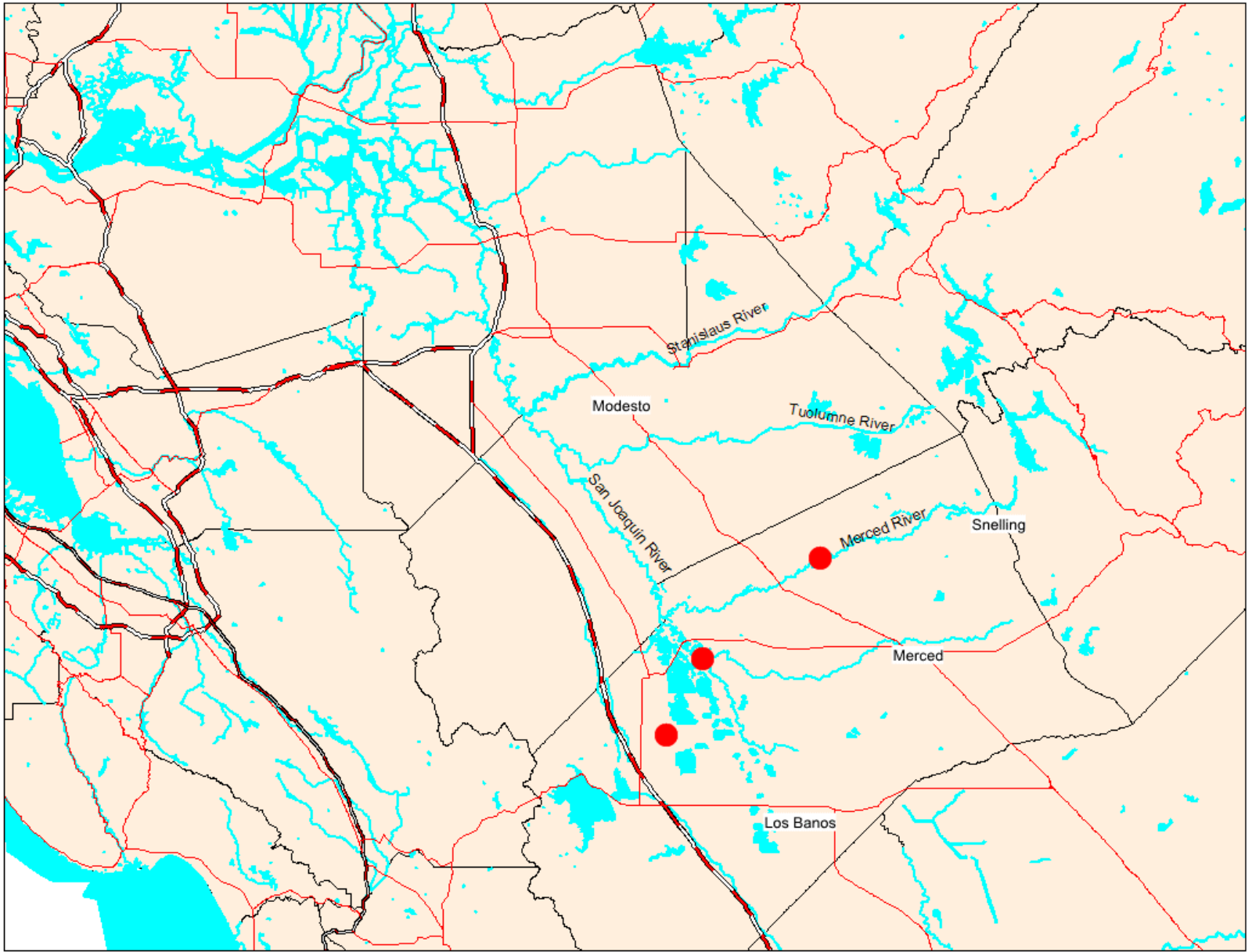
Louisiana Wildlife and Fisheries
<http://www.nutria.com/site4.php>



1939

1989

**Nutria damage, Chesapeake Bay
Blackwater Nat. Wildlife Refuge**







hh

hh





KRATVILLE
DAVID

EMERGENCY #
800.954.4115

VALID THRU
2018

cdfa
CALIFORNIA
DEPARTMENT OF
AGRICULTURE




University of California Coyote Cacher

Welcome to Coyote Cacher

Dear Coyote Cacher,

Coyote Cacher is part of a research project with the University of California Cooperative Extension that aims to collect more information on coyote encounters in California. The information you provide will be used to help inform researchers of trends in human-coyote interactions. If you wish to participate in this survey, please see the survey below to answer some questions. Participation is voluntary. If you require more information about this process please contact Human-Wildlife Interactions Advisor Dr. Niamh Quinn at nquinn@ucanr.edu at University of California Cooperative Extension, Orange County.



If you want to see where encounters are in your neighborhood, please click [here](#) for an interactive coyote encounter map.

Survey

[Click Here](#) for a mobile-friendly version of the survey


Name (required)

Email (required)

Phone Number

Time of Encounter (required)

Location



Alerts!

If you would like to sign up for coyote encounter email alerts for your zip code, please register here. Refer to the table below for an explanation of the alert levels.

Please refer to the following list when choosing your alerts:

- Sighting only
- Pet missing
- Coyote advanced towards or appeared to follow reporter
- Chased pet off-leash-no contact between coyote and pet
- Pet attacked off leash-contact between coyote and pet
- Chased pet on-leash-no contact between coyote and pet
- Pet attacked on-leash-contact between coyote and pet
- Pet killed by coyote
- Coyote bit reporter

	Alerts Received		
Email Alert Level	Green	Yellow	Red
Green	•	•	•
Yellow		•	•
Red			•

Name

Address

City

State

<http://ucanr.edu/sites/CoyoteCacher/>

Track coyote sightings

Mobile or desktop versions

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

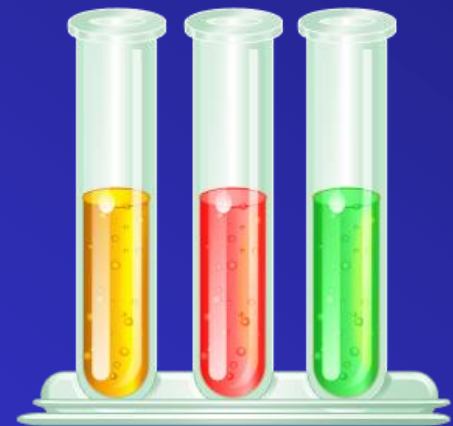
	WINTER	SPRING	SUMMER	AUTUMN
MAJOR ACTIVITY PERIODS				
adults		████████████████████		████████████████
reproduction		████████████		
juveniles	████████		████████████████████	
MAJOR FOOD SOURCE				
green foliage		████████████████████		
seeds			████████████████████	
BEST TIME FOR CONTROL				
fumigation	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

Anticoagulants

- Toxic bait that inhibits the coagulation of blood in the target pest.
- 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)

1st Generation Anticoagulants

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



2nd Generation Anticoagulants

- Genetically linked resistance in rats and mice to 1st 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.



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.



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



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

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.

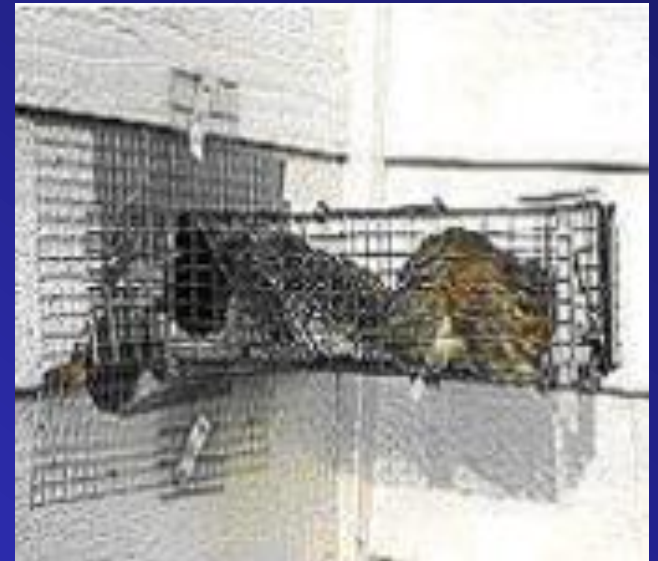
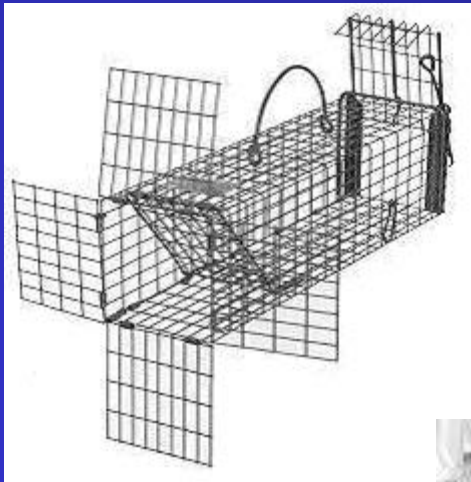
Cage traps



Cage Trap



One way traps



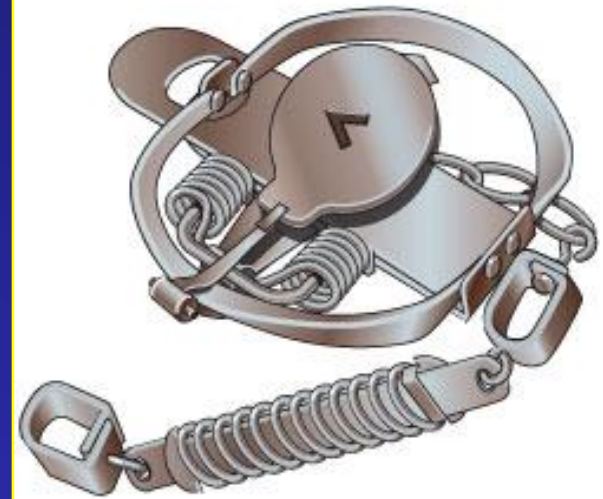
Tunnel traps



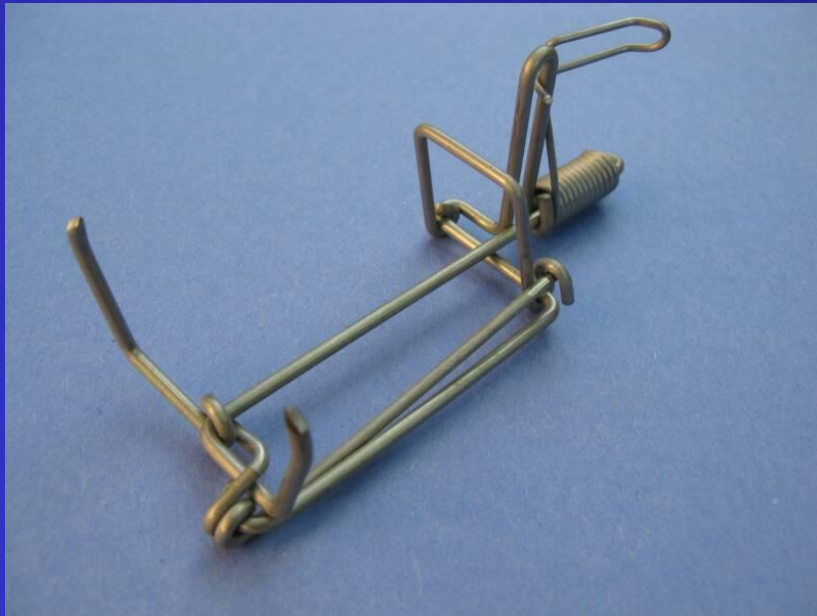
Conibear #110



Body Gripping Traps ILLEGAL in California



Gopher Traps



Trapline Gophinator
Mole trap for smaller gophers



Macabee style

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. The main content area features a search bar, a navigation menu, and a central section titled "California Natural Diversity Database" with a description and various links. A sidebar on the left lists "BDB PROGRAMS" and "CNDDDB Links". A right sidebar lists "CNDDDB NEWSLETTERS". At the bottom, there are contact tables for the "CNDDDB Coordinator", "Botany", and "Zoology" departments.

California Natural Diversity Database Home - Mozilla Firefox

www.dfg.ca.gov/biogeodata/cnddb/

Go to: [Mobile Content](#) | [Content](#) | [Footer](#) | [Accessibility](#)

Search GO

This Site California

Home Recreation Resource Management Enforcement Marine Spills Education Science Institute Data & Maps

Data Portal | Document Library | BIOS | Biogeographic Data |

Home → BDB → CNDDDB

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

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

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

Get Adobe Reader

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

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 web browser window titled "PRESCRIBE Online Database Application - Mozilla Firefox". The address bar displays "www.cdpr.ca.gov/docs/endspec/prescint.htm". The page header includes the "CA.GOV" logo and "California Department of Pesticide Regulation". A navigation menu contains links for Home, Health & Safety, Enforcement, Pest Management, Licensing, Registration, Monitoring, and Laws/Regulations. A secondary menu lists Complaints, County oversight, Actions, Compliance, Restricted materials, Endangered species, and Product compliance. A search bar is located in the top right corner with a "GO" button. The main content area is titled "PRESCRIBE Online Database Application" and includes a "Back to Endangered Species Project Main Page" link. The text welcomes users to the application and provides a detailed description of its purpose and the agencies involved. A "POPULAR LINKS" sidebar on the left lists various resources. The footer contains contact information and copyright details.

PRESCRIBE Online Database Application - Mozilla Firefox

www.cdpr.ca.gov/docs/endspec/prescint.htm

California Department of Pesticide Regulation

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

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

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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

CDPR

- About DPR
- Contact Us
- Customer Service Survey
- Join E-Lists

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
- 06 COLUSA

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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Pesticide use on Marijuana



PESTICIDE USE ON MARIJUANA

Department of
Pesticide Regulation

The following is being provided for informational purposes only and does not authorize, permit, endorse, or in any way approve the use, sale, cultivation, or any other activity associated with marijuana. Any such activity is subject to prosecution under federal law.

PESTICIDE REGISTRATION REQUIREMENTS

- Pesticides must be registered by both the U.S. Environmental Protection Agency (U.S. EPA) and the California Department of Pesticide Regulation (DPR) before they can be sold and used in California.
- There are no pesticides registered specifically for use directly on marijuana and the use of pesticides on marijuana plants has not been reviewed for safety or human health effects.
- Under California law, the only pesticide products not illegal to use on marijuana are those that contain an active ingredient that is exempt from residue-tolerance requirements; and
 - Registered and labeled for a use that is broad enough to include use on marijuana (e.g. unspecified green plants); or
 - Exempt from registration requirements as a minimum risk pesticide under FIFRA section 25(b) and 3 CCR § 6147. (FAC §§ 12973, 12995; 3 CCR § 6490.)

PESTICIDE USE REQUIREMENTS

- Before using any pesticide, ALWAYS read and follow the pesticide label. **The label is the law**
- If you apply pesticides to a field, you must obtain an operator identification number from the County Agricultural Commissioner and submit monthly pesticide use reports to that office. (FAC § 11408; 3 CCR § 6622; 3 CCR § 6627.) Note: No operator identification number will be issued in any local jurisdiction that prohibits marijuana cultivation.
- U.S. EPA designates certain pesticide products as federally “Restricted Use” products when they determine those products may cause unreasonable adverse effects even when used as directed on the product labeling. Restricted Use pesticides are limited to use by certified applicators, or to those under the supervision of a certified applicator.
- DPR designates certain pesticide active ingredients as California “Restricted Materials” when they determine those pesticides are especially hazardous to human health or the environment. Restricted Materials require a permit issued by the County Agricultural Commissioner. Permits will not be issued for marijuana cultivation sites. (FAC § 14001, et seq.; 3 CCR § 6400.)
- Employers must protect their workers from exposure to pesticides. State law requires that employers follow the pesticide label and:
 - Provide required personal protective equipment;
 - Provide required training and access to pesticide labels and safety information; and
 - Properly store, handle, and dispose of pesticides.

(See Compliance Assistance Booklet; 3 CCR § 6670, et seq.; 3 CCR § 6700, et seq.; < <http://www.cdpr.ca.gov/docs/enforce/cmpliaist/bkltmenu.htm> >.)

RODENTICIDE USE

- Rodenticides that are designated as California Restricted Materials cannot be used; and those that are only designated as federally Restricted Use products can only be used by a certified commercial applicator. See Above.
- There are some rodenticides labeled for below ground applications that are not designated as California Restricted Materials or federally Restricted Use pesticides that can be used if consistent with the label.
- The following rodent repellants may be used in and around marijuana cultivation sites consistent with the label: Capsicum Oleoresin, Putrescent Whole Egg Solids, Garlic

Rodenticides:

- Rodenticides that are designated as California Restricted Materials cannot be used.
- below ground applications that are not designated as California Restricted ...can be used if consistent with the label.
- The following rodent repellants may be used in and around marijuana cultivation sites consistent with the label: Capsicum Oleoresin, Putrescent Whole Egg Solids, Garlic

Resources

<http://vpcrac.org/about/vertebrate-pest-handbook/>

<http://www2.ipm.ucanr.edu/WhatIsIPM/>

<http://www.groundsquirlrelbmp.com/>

<http://wildlifecontroltraining.com/>

Thank you!



What's a pest?

A destructive insect, disease, animal or plant that attacks/damages crops, food, livestock, etc.

