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# Contra Costa County
# DECISION DOCUMENTATION for GROUND SQUIRREL MANAGEMENT

Date: 7/17/2025 DRAFT

Department: Public Works (Airports, Maintenance Division, Facilities Services), Agriculture

Location: Countywide

Introduction: Prior to 2025, the Agriculture Department provided internal contractual services to control ground squirrel issues on critical infrastructure managed by the Public Works Department primarily through the application of first-generation anticoagulant baits. Other treatments were considered and occasionally deployed by each operational division within Public Works, but the baiting program was the only consistent tactic used on a regular basis.

On January 1, 2025, Assembly Bill #2552 (AB 2552)[i]—also known as the Poison-Free Wildlife Act—took effect. That legislation prohibits the use of first-generation and second-generation anticoagulant rodenticides in California. There are some exceptions for public health, vector control, water supply facilities, and other situations. However, it appears that none of the exceptions apply to properties maintained by the County according to the current legislation and its interpretation.

This document aims to capture the decision-making process and promote a roadmap for the implementation of integrated efforts to protect infrastructure and keep our communities safe.

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| **The problem species has been identified as the following:** | **California Ground Squirrel** (*Otospermophilus beecheyi*)<br><br>Burrowing by ground squirrels can be very destructive, and they can cause severe erosion and loss of structural integrity. Ground squirrels are a problem in levees, in flood control facilities and canals, in earthen dams, on roads, on railroad berms, around foundations and retaining walls, and in landscaping where they chew on irrigation lines. In addition, California ground squirrels are known to be carriers of many transmissible diseases, including bubonic plague and tularemia. |
| **What mandates or standards relating to ground squirrel management apply?** | **All operational divisions in the County**<br>Contra Costa County Administrative Bulletin #542<br>"The County will provide pest management in and on County maintained properties and facilities using integrated pest management (IPM). The purpose of this policy is to promote the combined use of physical, cultural, biological, and chemical control methods to effectively manage pests with minimal risk to humans and the environment."<br><br>**Airports Division** (Airport infield surfaces, runway safety areas, taxiway safety areas, grazing areas, habitat management lands, etc. at Buchanan Field & Byron Airports):<br><br>Section 9.2.b of the Federal Aviation Administration (FAA) *Wildlife Hazard Management at Airports*[ii] describes habitat modification and exclusion practices.<br><br>The FAA has requirements for the safety areas of Part 139[iii] airports like Buchanan Field to be smooth, free of ruts and other obstructions, and able to support aircraft that leave the paved surfaces. Caltrans also has similar requirements for general aviation airports such as Byron Airport. Additionally, ground squirrels are an attractant for other species such as coyotes or hawks that could potentially cause catastrophic consequences for airplanes.<br><br>**Public Works Maintenance Division** (dams, levees, creeks, basins, roads, bridges, flood control structures, retaining walls):<br><br>Inspectors from U.S. Army Corps of Engineers (USACE) and state agencies have discretion to determine whether damage caused by burrowing animals is problematic. Generally, the Division aims to maintain a squirrel-free area on and within 100 feet of dams and levees.<br><br>**Public Works Facilities Services Division** (County buildings, communication towers, and landscapes/open space adjacent to facilities, within special district service areas, and in County-owned parks):<br><br>No known formal standards apply, but burrow systems that undermine building foundations, paved areas, and other structures are not tolerated. Similarly, burrowing activity that creates trip hazards or other safety concerns in parks and other publicly accessible landscapes are prioritized for treatment controls. |

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| **What is the process for how sites are monitored for ground squirrel activity?** | **Airports Division**:<br><br>Airport Operations staff at both sites monitor ground squirrel activity. Abatement procedures are used whenever those activities enter safety areas and sometimes before when the timing is right for our control methods. Any population in the safety areas is the threshold, we cannot have any. Airport Safety Officers determine whether abatement is needed as part of their wildlife hazard management duties.<br><br>**Public Works Maintenance Division**:<br><br>Activity is monitored during levee inspections conducted in coordination with the U.S. Army Corps of Engineers (USACE). Monitoring for ground squirrel activity is critical component of evaluating levee integrity. These inspections are typically led by the USACE inspection team alongside local representatives such as Flood Control Crew Supervisor—who oversees site readiness and facilitates issue tracking. State inspectors annually monitor the structural integrity of each dam and they convey site-specific concerns. Other reports of rodent activity come from citizen calls, as well as Public Works and Agriculture Department staff.<br><br>**Public Works Facilities Services Division**:<br><br>Facility occupants typically alert the Division to ground squirrel concerns at County-owned buildings. The contracted structural pest control operator similarly reports any activity observed during routine service visits. For parks and special district landscapes, community members occasionally report applicable concerns. Special district service areas retain a contracted trapper for gophers and moles, but that does not include ground squirrels.<br><br>**Department of Agriculture/Weights & Measures:**<br><br>The vertebrate pest management program provides assistance and advice on a cooperative basis to the Public Works Department, other public agencies, and growers for the control of ground squirrels. In some cases, Agriculture personnel assist Public Works in monitoring squirrel activity. |
| **Control Methods** | **This is not an attempt to consider all control methods available. The following sections identify the types of controls that are most likely to be incorporated into County operations. It is not an exhaustive list. For more information on controls see http://www.groundsquirrelbmp.com/**<br><br>**The County continues to investigate and review new control methods as they become available.** |
| **Timing and Efficacy of Management Methods** | **The following chart[iv] depicts the yearly activities of the California ground squirrel and times when baiting, trapping, fumigation, and other management practices are generally most effective.**<br><br>  <br><br>Note: Ground squirrel activity may vary by region. This variance may affect management windows. |

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| **Which cultural controls were considered?** | **Habitat modification:**<br><br>Proactive Vegetation Management: This can involve the strategic planting of trees and shrubs and allowing herbaceous vegetation to grow more densely in order to make it more difficult to detect predators.<br><br>Deep Ripping: Using tractor-mounted ripping bars where burrow entrances are present in order to reduce the likelihood of ground squirrel reinvasion.<br><br>**EFFICACY:** Low<br><br>**CONCLUSIONS**:<br><br>**Airports Division:** Trees and shrubs are not appropriate for airport operations. Some areas surrounding the Byron Airport may be suitable for proactive planting, but are not being considered at this time. Deep ripping is not feasible at either location.<br><br>**Maintenance Division:** Dams and levees typically are not suitable for woody vegetation. Recent projects have restored riparian plantings as part of broader flood risk reduction efforts along creeks, but those activities are not feasible with maintenance operations. Tree planting on certain roadsides may be considered in the future, but those situations are more likely when tied to capital improvements. Deep ripping is not presently being evaluated.<br><br>**Facilities Services Division:** Many facilities would benefit from expanded tree planting. However, the locations where ground squirrel populations occur do not typically coincide with the most appropriate planting sites. The Division is not evaluating deep ripping.<br><br>**Agriculture Department:** These services are not offered through existing programs within the Department.<br><br>**Statement on efforts to prevent impacts on non-target species:** |
| **Which physical controls were considered?** | **Burrow modification**:<br><br>Cement and grout: Injection of concrete, grout, or similar materials into burrow entrances.<br><br>The Burrow Blocker: A patented system that injects a sand and water slurry into burrows.<br><br>**Shooting**: The use of small caliber rifles to dispatch ground squirrels causing damage to critical infrastructure.<br><br>**Trapping:** Various types of live traps and kill traps are available. Ground squirrels caught with live traps cannot be relocated and must be humanely euthanized.<br><br>**Exclusion**: Includes a variety of materials installed in a manner that limits access to particular areas.<br><br>**EFFICACY:** Moderate (with the exception of exclusion, which is considered low efficacy. Also, research is limited regarding the efficacy of the Burrow Blocker and similar strategies involving cementing/grouting burrow entrances.)<br><br>**CONCLUSIONS**:<br><br>**Airports Division:** Certain areas of Division properties have incorporated fencing that has slowed access to runways and taxiways. These renovations are expensive and it is unlikely that they will be implemented at the scale needed at both airports. Trapping and burrow modification efforts are currently being explored.<br><br>**Maintenance Division:** The Division previously injected grout into the entrances of ground squirrel burrows at some sites. The practice has not been used for several years, but the Division is analyzing the continuation of burrow modification practices and incorporating trapping. Burrow entrances next to paved roads will likely be filled with asphalt or other suitable materials while the Division adapts to recent rodenticide restrictions.<br><br>**Facilities Services Division:** Trapping services are currently carried out by a contracted service provider at certain sites. The Division is open to exploring the expansion of trapping and the implementation of limited pilot projects to evaluate burrow modification measures. Exclusion practices are also being explored at some locations.<br><br>**Agriculture Department:** These services are not offered through existing programs within the Department. In 2012, the Department conducted an in-house trial of live trapping and found it to be expensive and time-consuming. Pending staffing changes may add capacity to revisit trapping trials that could inform the feasibility of Public Works potentially incorporating these practices into their operations at some locations in the future.<br><br>**Statement on efforts to prevent impacts on non-target species:** Among physical controls, trapping and shooting represent the lowest risk of impacts to non-target species. Nonlead ammunition is required. Guidance from the Public Works Environmental Services Division is recommended when considering burrow modification tactics. |
| **Which biological controls were considered?** | **Biological controls available:** Raptor perches and barn owl boxes are often deployed to target burrowing pest species. Since ground squirrels are diurnal, raptors active during the day are more likely than barn owls to prey on them. Barn owls are crepuscular and nocturnal, so they may hunt ground squirrels that are active at dusk and dawn. Installations like these are usually ineffective at controlling targeted pests if not deployed alongside other integrated methods. Interested members of the public typically have a favorable view of these measures.<br><br>**EFFICACY:** Low |

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| | **CONCLUSIONS**:<br><br>**Airports Division:** Due to safety concerns and federal regulations, raptor perches and owl boxes are not being considered at airports.<br><br>**Maintenance Division:** Community groups and adjacent property owners have installed these types of structures on or near Flood Control properties in the past, but many have fallen into disrepair. The Division may consider this further in the future but is focused on other controls at present.<br><br>**Facilities Services Division:** Some parks managed by Facilities Services have owl boxes, but it isn't clear if they are being maintained. The addition of new boxes and perches is feasible, but partnerships to take care of them need to be tidied.<br><br>**Agriculture Department:** These services are not offered through existing programs within the Department. Pending staffing changes may add capacity to research where proactive efforts to incorporate these types of measures.<br><br>**Statement on efforts to prevent impacts on non-target species:** Negative impacts on non-targets are not anticipated with efforts described in this section. |
| **Which chemical controls were considered?**<br><br>(an accompanying section referencing the Pesticide Risk Footprint Tool is under construction) | *Toxic Baits:*<br><br>**Zinc Phosphide:** A non-anticoagulant rodenticide that converts to phosphine gas when consumed by the target animal. Zinc phosphide is a restricted use material and is a hazard to the applicator. There are also endangered species concerns and restrictions to consider prior to use.<br><br>**Diphacinone or Chlorophacinone-treated grain bait:** First generation anticoagulant rodenticides that are no longer accessible to most County-managed properties unless existing exemptions are further researched or applicable legislation is amended.<br><br>**Strychnine-treated grain bait:** Most formulations are restricted use materials and must be used by certified applicators below ground. It is also deemed a highly hazardous pesticide (HHP) by the World Health Organization (WHO) due to acute health hazards.<br><br>*Burrow fumigation methods:*<br><br>**Gas cartridge**: The cartridge (made from sodium nitrate, charcoal, and cardboard) releases carbon monoxide gas into the burrow system. This method is only effective when the soil moisture is high in either winter or spring. Gas cartridges are more effective when used prior to breeding or emergence of young. The timing, though, conflicts with other programs for which staff are needed such as the noxious weed program, the pesticide use enforcement program and the pest exclusion program. There are endangered species restrictions and concerns to consider prior to use.<br><br>**Aluminum phosphide**: Aluminum phosphide reacts with moisture in the soil and in the atmosphere to produce phosphine gas. This fumigant is only effective when soil moisture is high and so has the same timing issues as above. Aluminum phosphide is a restricted use material and is a hazard to the applicator. There are also endangered species concerns and restrictions to consider prior to use.<br><br>**CO and $CO_2$**: These fumigants require a CO or $CO_2$ generating device, which must be moved from burrow to burrow and site to site during treatment. These are most effective when soil moisture is high, and they have the same timing issues as gas cartridges and aluminum phosphide.<br><br>**EFFICACY:** High<br><br>**CONCLUSIONS:**<br><br>**Airports Division:** The Division is working with the Agriculture Department to study the potential of using alternative baits in high risk areas at each airport. They are also evaluating cost and other considerations related to potential burrow fumigation controls.<br><br>**Maintenance Division:** Some initial efforts using CO were completed in a levee system a few years ago. The Division is reviewing the possibility of expanding those efforts in additional areas, but cost is a barrier. They also recently retained the services of Ag. personnel to deploy gas cartridges. Evaluation of additional chemical controls is ongoing.<br><br>**Facilities Services Division:** The current contract for structural pest management services includes ground squirrel control on an on-call basis. The business under contract provides some chemical controls and owns a large carbon monoxide injection system known as a CO-Jack. This contract has been used by Facilities Services and other divisions within Public Works and is available as long as the approved dollar amount for total contract is not exceeded.<br><br>**Agriculture Department:** The Department will continue to support Public Works' efforts to review chemical alternatives to anticoagulant rodenticides. In limited circumstances, Ag personnel may be able to assist with using gas cartridges on certain properties, but these staff members are usually engaged in important regulatory work during the season when the devices are most effective.<br><br>**Statement on efforts to prevent impacts on non-target species:** Prior to recent legislative restrictions, the primary method of ground squirrel control to protect infrastructure at airports, dams, roadsides, and other County-owned sites was through the use of diphacinone or chlorophacinone-treated grain bait. Like most chemical and non-chemical pest management tactics, those applications represented a certain level of risk. Many reputable subject matter experts are concerned that these restrictions—which were intended to protect wildlife—were more targeted to the control of ground squirrels with limited off-target impacts. Burrow fumigation and other non-chemical tactics could threaten other species living in burrows. Since these considerations are often site-specific and subject to other key variables, the Public Works Environmental Services Division, the PRESCRIBE[v] database, and other applicable resources should be consulted. |

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| **DRAFT**<br><br>**Recommendations from the IPM Advisory Committee** | • Each applicable operational division within Public Works is encouraged to allocate resources to promote a year-round ground squirrel monitoring and treatment program at threatened sites. Control methods deemed "High Efficacy" and "Moderate Efficacy" by the University of California Statewide IPM Program should be prioritized. Such efforts may include:<br>  • Coordinating an RFP (Request for Proposals) process to procure on-call services that are currently unavailable from County staff and existing contracts. Services may include burrow modification, shooting, and other tactics.<br>  • Collaboration with UC partners in facilitating research that furthers understanding of the impacts and efficacy of under-studied management strategies.<br>  • Assessing the feasibility of utilizing the IPM Coordinator[vi] to set up a trapping pilot program at one or two priority sites. The purpose of this program will be to:<br>  1. provide immediate support at critical locations while each operational division concurrently ramps up integrated strategies to address the anticipated increase in problematic ground squirrel populations.<br>  2. Inform the potential development of operational staff or contractors performing long-term trapping operations where feasible.<br>• The Board of Supervisors is encouraged to direct County lobbyists to follow and potentially shape legislative developments that expand exemptions for first generation anticoagulant rodenticides at airports, dams constructed for the purpose of flood risk reduction, roads, and other elements of critical infrastructure. Efforts relating to this may also include the following:<br>  • Engage the California State Association of Counties (CSAC) and comparable local government entities to identify opportunities to closely study the potential impacts of AB 2552 and shape an effective plan of action.<br>  • Support the efforts of County staff working with their equivalents in other local government agencies to further meaningful dialog about legislative refinements within the respective realm of each discipline or industry. |

[i] Available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240AB2552

[ii] https://www.faa.gov/airports/airport_safety/wildlife/resources/media/2005_FAA_Manual_complete.pdf

[iii] FAA certification program for certain types of airports. More information available at the following link: https://www.faa.gov/airports/airport_safety/part139_cert

[iv] Chart is from the University of California Statewide IPM Program's Pest Note for Ground Squirrels available at: https://ipm.ucanr.edu/legacy_assets/PDF/PESTNOTES/pngroundsquirrel.pdf Quinn NM, Dimson MJ, Baldwin RA. 2025. UC IPM Pest Notes: Ground Squirrel. UC ANR Publication 7438. Oakland, CA

[v] PRESCRIBE stands for Pesticide Regulation's Endangered Species Custom Realtime Internet Bulletin Engine and is available at: https://calpip.cdpr.ca.gov/county.cfm

[vi] Labor costs associated with the IPM Coordinator are already covered by various Public Works funding streams; only fees associated with start-up costs, and ongoing materials and supplies would be needed if there is an appetite to move forward.