CONTRA COSTA COUNTY

AGENDA

Integrated Pest Management Advisory Committee

Thursday, August 21, 2025 **10:00 AM** **2380 Bisso Lane, Concord**
https://zoom.us/j/97982014544
Call in: (669) 900-6833
Meeting ID: 97982014544

Decision-Making Subcommittee

Susanna Thompson (Committee Chair)
Carlos Agurto (Subcommittee Chair)

Items may be taken out of order at the discretion of the Subcommittee Chair

1. Convene and Introductions

2. Public comment on items not on this agenda (speakers will be limited to three minutes unless otherwise indicated by the Chair)

3. CONSIDER approval of the May 15, 2025 and July 17, 2025 IPM Decision-Making Subcommittee meeting minutes. **25-3363**

Attachments: #3 Att1 5.15 IPM DMS Minutes_DRAFT
#3 Att2 7.17 IPM DMS Minutes_DRAFT

4. REVIEW proposed draft revisions of the ground squirrel decision document and CONSIDER approval with suggested edits. **25-3364**

Attachments: #4 Att 1_Dec Doc for GS_DRAFT 3

5. REVIEW the grazing decision tree and ADVISE staff on possible revisions. **25-3365**

Attachments: #5 Att 1_PW Grazing Decision Tree
#5 Att 2_Guide to Livestock Leases_UCANR

6. REVIEW commensal rodent and gopher management decision documents and DETERMINE whether there is interest in revising the documents and ADVISE staff on the preferred process for making revisions. **25-3366**

Attachments: #6 Att1_Commensal Rodent Management
#6 Att2_Gopher Management in Landscapes
#6 Att3_Rat Management at Livorna Park

7. PLAN October 16, 2025 meeting. **25-3367**

Adjourn

The Committee and its subcommittees will provide reasonable accommodations for persons with disabilities planning to attend meetings. Contact the staff person listed below at least 72 hours before the meeting. Any disclosable public records related to an open session item on a regular meeting agenda and distributed by the County to a majority of members of the Committee less than 96 hours prior to that meeting are available for public inspection at 4585 Pacheco Blvd. Martinez, CA 94553, during normal business hours. Staff reports related to items on the agenda are also accessible online at www.contracosta.ca.gov. If the Zoom connection malfunctions for any reason, the meeting may be paused while a fix is attempted. If the connection is not reestablished, the committee will continue the meeting in person without remote access. Public comment may be submitted via electronic mail on agenda items at least one full work day prior to the published meeting time.

For additional information, contact Wade.Finlinson@cchealth.org or 925.655.3214

File #: 25-3363 **Agenda Date:** 8/21/2025 **Agenda #:** 3.

Advisory Board: Integrated Pest Management Advisory Committee-Decision-Making Subcommittee
Subject: 3. CONSIDER approval of the May 15, 2025 and July 17, 2025 IPM Decision-Making Subcommittee meeting minutes.
Presenter: Wade Finlinson
Contact: 925.655.3214

Information:
County Ordinance (Better Government Ordinance 95-6, Article 25-205, [d]) requires that each County Body keep a record of its meetings. Though the record need not be verbatim, it must accurately record the Committee's official decisions and actions. Minutes should include a brief description of any motion considered (whether or not it is approved), and must record the vote taken on the motion. Votes must be recorded in the minutes using the format required in California law.

Referral History and Update:
The draft minutes for the May 15, 2025 and July 17, 2025 meetings of the IPM Decision-Making Subcommittee are included in this agenda packet.

Recommendation(s)/Next Step(s):
Staff recommends approval of the May 15, 2025 and July 17, 2025 minutes with any necessary corrections.

DRAFT Minutes

CONTRA COSTA COUNTY INTEGRATED PEST MANAGEMENT DECISION-MAKING SUBCOMMITTEE
A subcommittee of the IPM Advisory Committee

May 15, 2025
10:00 AM

Held at the Agricultural Commissioner's office at 2380 Bisso Lane in Concord

Members Present: Carlos Agurto (Chair), Susanna Thompson, Chris Lau, Gabe Chan, Andrew Sutherland

Members Absent: None

Others Present: Matt Slattengren, Cameron Collins, Wade Finlinson, Kamyar Aram, Carolyn Whitesell

1. **Convene and introductions**
   The Chair called the meeting to order at 10:02 AM.

2. **Public comment on items not on this agenda**

3. **Consider approval of the April 17, 2025 IPM Decision-Making Subcommittee meeting minutes**
   A motion was made and seconded (AS/ST) to approve the April 17, 2025 minutes as corrected
   Ayes: Chan, Sutherland, Thompson, Agurto
   Noes: None
   Abstain: None
   Absent: Lau

   Public Speakers: None

4. **Review ground squirrel decision documents and advise staff on additional revisions.**
   The IPM Coordinator introduced the attached initial draft revision of the ground squirrel decision document. The subcommittee reviewed the document and the implications of recent legislation restricting the use of most rodenticides on County-managed infrastructure.

   Subcommittee and other attendees made the following observations:
   - As currently written, there are no exemptions listed in AB 2552 that would allow first or second generation rodenticides to control ground squirrels on County property. County Counsel indicated that the agriculture production and water supply exemptions do not apply to County-owned parcels.
   - There were concerns expressed regarding the removal of the Agriculture Department from this version. Additional questions were asked about the weed and vertebrate

management programs of the Agriculture, particularly in the realm of contracted services provided to external agencies.

- Since first and second generation anticoagulant baits are no longer available, many of the remaining ground squirrel control tactics have the potential to negatively impact threatened and endangered species.
- In this county, operational departments seem to be reliant on the Agriculture Department for ground squirrel management. The departments need to be responsible for taking care of their assets. There was a suggestion to develop this concern into a recommendation.
- Linear structures like roads and levees will be more difficult to impact ground squirrel populations and will be critical to have a system in place to monitor and repair damage.
- There were questions about the availability of the Burrow Blocker system.
- Of the three Public Works operational divisions that deal with ground squirrels, only Facility Services has an external contract in place to control ground squirrels. Each division will need to take the lead in developing their own program to manage ground squirrels.
- Since burrow fumigation is the only other highly effective tactic besides baiting, operational divisions should aggressively pursue how to implement this strategy.
- Ground squirrel damage to County infrastructure will likely increase without dedicated operational adjustments.

Public Speakers: None

Note: Chris Lau arrived at 10:09 AM, during the beginning of item #4.

5. **Plan July 17, 2025 meeting**
   Items to be agendized for the next meeting include continuing discussion the ground squirrel document, an update from public works on their report to TWIC (Transportation, Water and Infrastructure Committee of the Board of Supervisors), and an initial review of the commensal rodent decision documents.
   A motion was made and seconded (AS/ ST) to invite representatives from Santa Clara County, East Bay Regional Parks District, and the East Contra Costa Habitat conservancy to present at the next meeting.
   Ayes: Chan, Sutherland, Lau, Thompson
   Noes: None
   Abstain: Agurto
   Absent: None

   Public Speakers: None

The meeting adjourned at 11:59 AM.

Attachment:
5/15/25 DRAFT Decision Documentation for Ground Squirrel Management

—end of meeting minutes—

DRAFT

Contra Costa County
DECISION DOCUMENTATION for GROUND SQUIRREL MANAGEMENT

Date: 5/15/2025 DRAFT

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

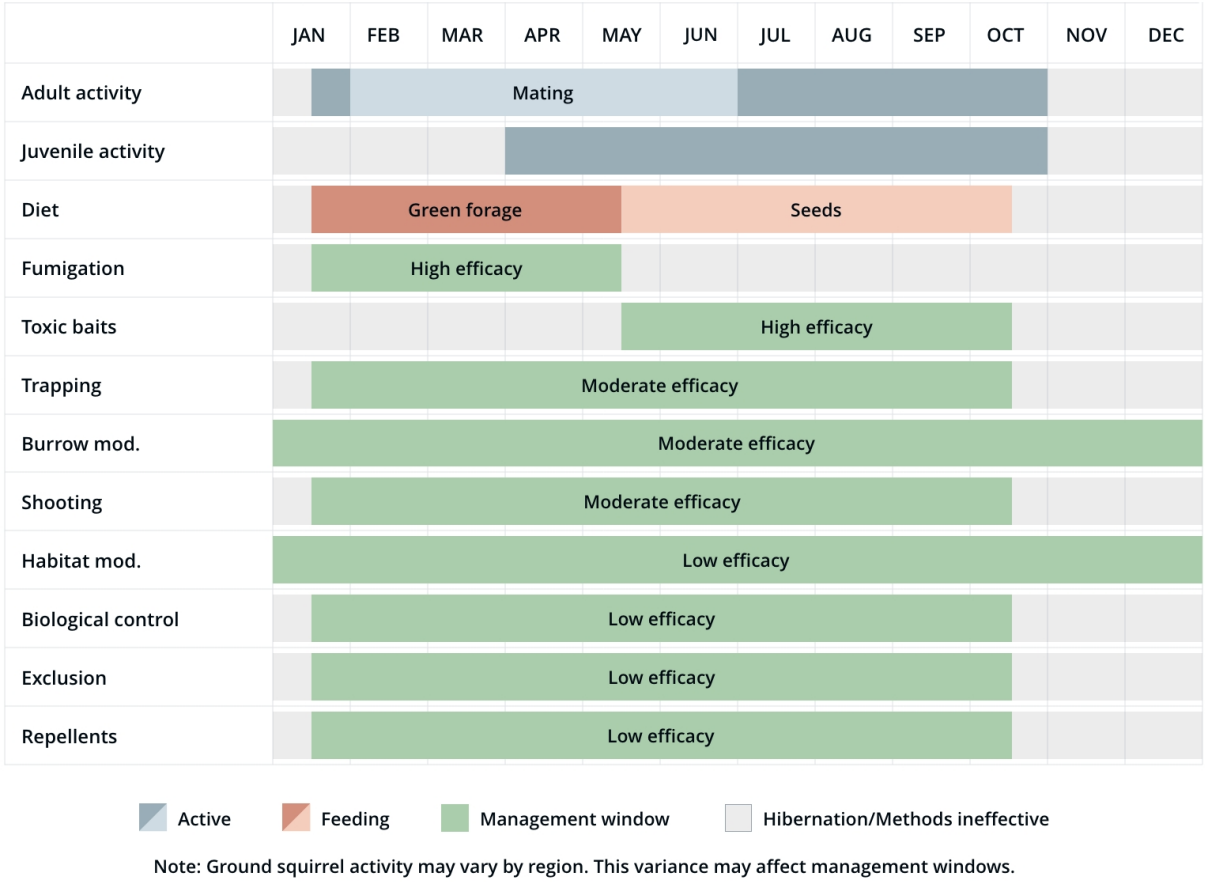
Location: Countywide

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, 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.

The problem species has been identified as the following:	**California Ground Squirrel** (*Otospermophilus beecheyi*) 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** Contra Costa County Administrative Bulletin #542 "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." **Airports Division** (Airport infield surfaces, runway safety areas, taxiway safety areas, grazing areas, habitat management lands, etc. at Buchanan Field & Byron Airports): Section 9.2.b of the Federal Aviation Administration (FAA) *Wildlife Hazard Management at Airports*[ii] describes habitat modification and exclusion practices. 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. **Public Works Maintenance Division** (dams, levees, creeks, basins, roads, bridges, flood control structures, retaining walls): *(Additional information needed regarding mandates or standards from U.S. Army Corps of Engineers (USACE), state agencies, or others as applicable)* **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): 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.

What is the process for how sites are monitored for ground squirrel activity?	**Airports Division**: 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. **Public Works Maintenance Division**: 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. **Public Works Facilities Services Division**: 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.
Control Methods	**This is not an attempt to consider all control methods available. The following identifies the many types of controls that have been reviewed and/or used by the County. It is not an exhaustive list. For more information on controls see http://www.groundsquirrelbmp.com/** **The County continues to investigate and review new control methods as they become available.**
Timing and Efficacy of Management Methods	**The following chart depicts the yearly activities of the California ground squirrel and times when baiting, trapping, fumigation, and other management practices are generally most effective.**  Chart is from the University of California Statewide IPM Program's Pest Note for Ground Squirrels[iv]
Which cultural controls were	**Habitat modification:**

considered?	**CONCLUSIONS**: **Airports Division:** **Maintenance Division:** **Facilities Services Division:** **Statement on efforts to prevent impacts on non-target species:**
Which physical controls were considered?	**Burrow modification**: Cement and Bentonite Grout: The Burrow Blocker: Deep Ripping: **Shooting**: "Shooting squirrels with small caliber rifles can provide some ground squirrel control, but it is very time-consuming. Additionally, discharging a firearm is not legal in most municipalities." "The California Department of Fish and Wildlife (CDFW) has prohibited the use of lead projectiles in some firearms within the range of the California condor. Likewise, leaving lead projectiles behind (within animal carcasses) can be hazardous since it may result in their ingestion by scavengers. Currently, the use of lead ammunition is permitted for take of small nongame animals such as ground squirrels. However, effective July 1, 2019, nonlead ammunition will be required when taking any wildlife with a firearm anywhere in California."[v] **Trapping:** **Live Trapping**: **Kill trapping**: **Exclusion**: **CONCLUSIONS**: **Airports Division:** **Maintenance Division:** **Facilities Services Division:** **Statement on efforts to prevent impacts on non-target species:**
Which biological controls were considered?	**Biological controls available:** **CONCLUSIONS**: **Airports Division:** **Maintenance Division:** **Facilities Services Division:** **Statement on efforts to prevent impacts on non-target species:**
Which chemical controls were considered?	*Toxic Baits:* **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. *Burrow fumigation methods:* **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. **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. **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. Devices using CO_2 to kill ground squirrels are not yet registered through the Department of Pesticide Regulation. **CONCLUSIONS:** **Airports Division:** **Maintenance Division:** **Facilities Services Division:** **Statement on efforts to prevent impacts on non-target species:**
Recommendations from the IPM Advisory Committee	• *A potential recommendation involving the allocation of resources to promote a year-round ground squirrel monitoring and treatment program was suggested at the April 17th meeting and requires further study.* •

[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] Retrieved from UCIPM Ground Squirrel Pest note at https://ipm.ucanr.edu/home-and-landscape/ground-squirrel/pest-notes/#gsc.tab=0

[v] Retrieved from UCIPM Ground Squirrel Pest note at https://ipm.ucanr.edu/home-and-landscape/ground-squirrel/pest-notes/#gsc.tab=0

DRAFT Minutes

CONTRA COSTA COUNTY INTEGRATED PEST MANAGEMENT DECISION-MAKING SUBCOMMITTEE
A subcommittee of the IPM Advisory Committee

July 17, 2025
10:00 AM

Held at the Agricultural Commissioner's office at 2380 Bisso Lane in Concord

Members Present: Carlos Agurto (Chair), Susanna Thompson, Chris Lau, Gabe Chan, Andrew Sutherland

Members Absent: None

Others Present: Matt Slattengren, Cameron Collins, Jay Humiston, Shravan Sundaram, Wade Finlinson, Kamyar Aram, Carolyn Whitesell, Jaclyn Lim, Pamela Beitz, Mike Tikalsky

1. **Convene and introductions**
   Meeting convened at 10:05 AM.

2. **Public comment on items not on this agenda**
   None

3. **REVIEW proposed draft revisions of the ground squirrel decision document and ADVISE staff on next steps.**
   This item was introduced by the IPM Coordinator using the attached handout that depicts some of the ground squirrel control tactics used by other agencies. The Subcommittee reviewed the attached second draft of the document and suggested various edits. Additional topics discussed included the following:
   - If there are no standards, goals, or tolerance levels for burrowing damage on roadways, it will be difficult to prioritize locations to control tactics.
   - Availability of the Burrow Blocker.
   - Off target impacts of zinc phosphide.
   - Encouragement to develop grant proposals to fund demonstration and evaluation of the efficacy and economics of various pest management tactics.
   - The fiscal resources required to implement other ground squirrel control strategies may be significant.
   - The process for evaluating impacts to species of concern will vary depending on location and proposed control tactics.

   Public Speakers: None

4. **RECEIVE update regarding the Public Works follow up report to the Transportation, Water, and Infrastructure Committee (TWIC) at their June 23, 2025 meeting**

Public Works summarized the following updates in addition to what was captured in the attached staff report to TWIC:

- Recruitment for Vegetation Management Technician was open from June 24th to July 8th. The Division initially sought to fill three vacancies, but an additional position was recently vacated, leaving four positions now sought.
- The Senior Vegetation Management Technician was an internal promotion.
- Civicorps has been engaged to do some weed abatement work along the Walnut Creek channel. The contract expires in April 2026, so additional opportunities may be limited unless the contract is amended or a new solicitation is put out.

Public Speakers: None

5. **REVIEW commensal rodent and gopher management decision documents and DETERMINE whether there is interest in revising the documents and ADVISE staff on the preferred process for making revisions.**
   This item was tabled and will be on the agenda for the next meeting.

6. **PLAN August 21, 2025 meeting**
   Items to be agendized for the next meeting include continuing discussion the ground squirrel document, an initial review of the commensal rodent decision documents, and a review of the grazing decision tree.

   Public Speakers: None

The meeting adjourned at 11:56 AM.

Attachments:

7/17/25 DRAFT Decision Documentation for Ground Squirrel Management
Handout of photos depicting physical control options for ground squirrels
6/23/25 TWIC staff report

—end of meeting minutes—

DRAFT

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.

The problem species has been identified as the following:	**California Ground Squirrel** (*Otospermophilus beecheyi*) 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** Contra Costa County Administrative Bulletin #542 "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." **Airports Division** (Airport infield surfaces, runway safety areas, taxiway safety areas, grazing areas, habitat management lands, etc. at Buchanan Field & Byron Airports): Section 9.2.b of the Federal Aviation Administration (FAA) *Wildlife Hazard Management at Airports*[ii] describes habitat modification and exclusion practices. 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. **Public Works Maintenance Division** (dams, levees, creeks, basins, roads, bridges, flood control structures, retaining walls): 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. **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): 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.

What is the process for how sites are monitored for ground squirrel activity?	**Airports Division**: 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. **Public Works Maintenance Division**: 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. **Public Works Facilities Services Division**: 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. **Department of Agriculture/Weights & Measures:** 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/** **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.**  Note: Ground squirrel activity may vary by region. This variance may affect management windows.

Which cultural controls were considered?	**Habitat modification:** 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. Deep Ripping: Using tractor-mounted ripping bars where burrow entrances are present in order to reduce the likelihood of ground squirrel reinvasion. **EFFICACY:** Low **CONCLUSIONS**: **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. **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. **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. **Agriculture Department:** These services are not offered through existing programs within the Department. **Statement on efforts to prevent impacts on non-target species:**
Which physical controls were considered?	**Burrow modification**: Cement and grout: Injection of concrete, grout, or similar materials into burrow entrances. The Burrow Blocker: A patented system that injects a sand and water slurry into burrows. **Shooting**: The use of small caliber rifles to dispatch ground squirrels causing damage to critical infrastructure. **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. **Exclusion**: Includes a variety of materials installed in a manner that limits access to particular areas. **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.) **CONCLUSIONS**: **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. **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. **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. **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. **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. **EFFICACY:** Low

	CONCLUSIONS: **Airports Division:** Due to safety concerns and federal regulations, raptor perches and owl boxes are not being considered at airports. **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. **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. **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. **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? (an accompanying section referencing the Pesticide Risk Footprint Tool is under construction)	*Toxic Baits:* **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. **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. **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. *Burrow fumigation methods:* **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. **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. **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. **EFFICACY:** High **CONCLUSIONS:** **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. **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. **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. **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. **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.

DRAFT
 	
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:
	  • 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.
	  • Collaboration with UC partners in facilitating research that furthers understanding of the impacts and efficacy of under-studied management strategies.
	  • 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:
	  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.
	  2. Inform the potential development of operational staff or contractors performing long-term trapping operations where feasible.
	• 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:
	  • 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.
	  • 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

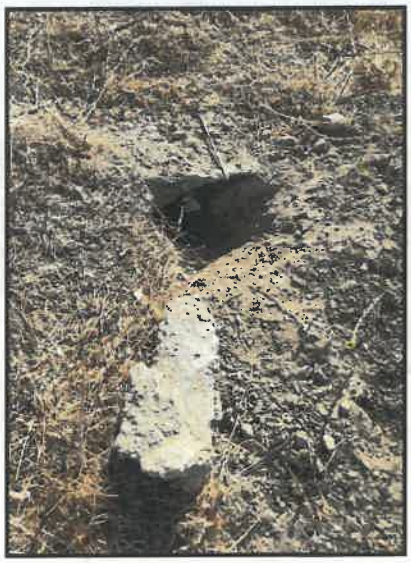
[iv] Chart is from the University of California Statewide IPM Program's Pest Note for Ground Squirrels available at: https://ipm.ucanr.edu/legacy_assets/PDF/PESTNOTES/pngroundsquirrel.pdf Quinn NM, Dimson MJ, Baldwin RA. 2025. UC IPM Pest Notes: Ground Squirrel. UC ANR Publication 7438. Oakland, CA

[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.

1

Burrow Modification



Grout/concrete

2

Burrow Modification

Grout/concrete

3

Burrow Modification

Burrow Blocker

4

Burrow Modification

Burrow Blocker

5

Trapping

Photo by Karey Windbiel-Rojas

Live traps

6

Trapping

Euth. Chamber.

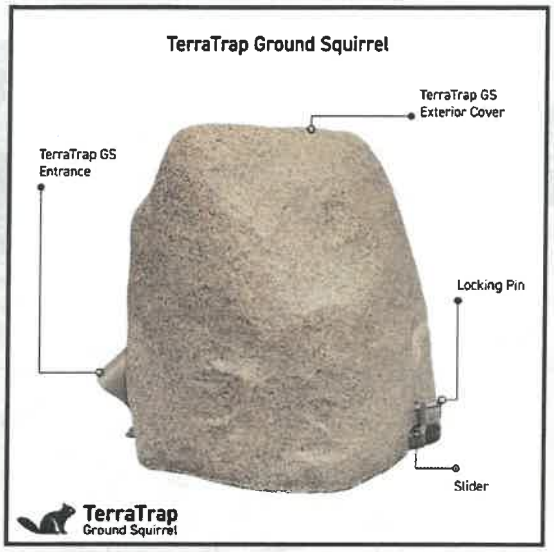
7

Trapping

Kill traps

8

Trapping



Kill traps

Retrieved from automatictrap.com/ttgs

9

Trapping

Kill traps

Retrieved from automatictrap.com/ttgs

10

Exclusion

Fencing

11

Exclusion

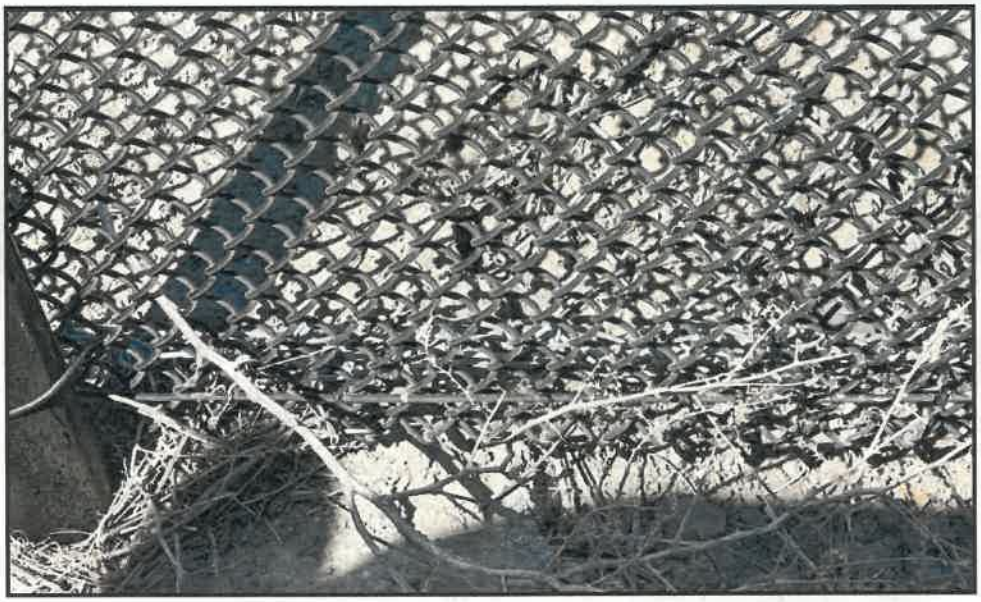


Photo by Russell Milburn

Fencing

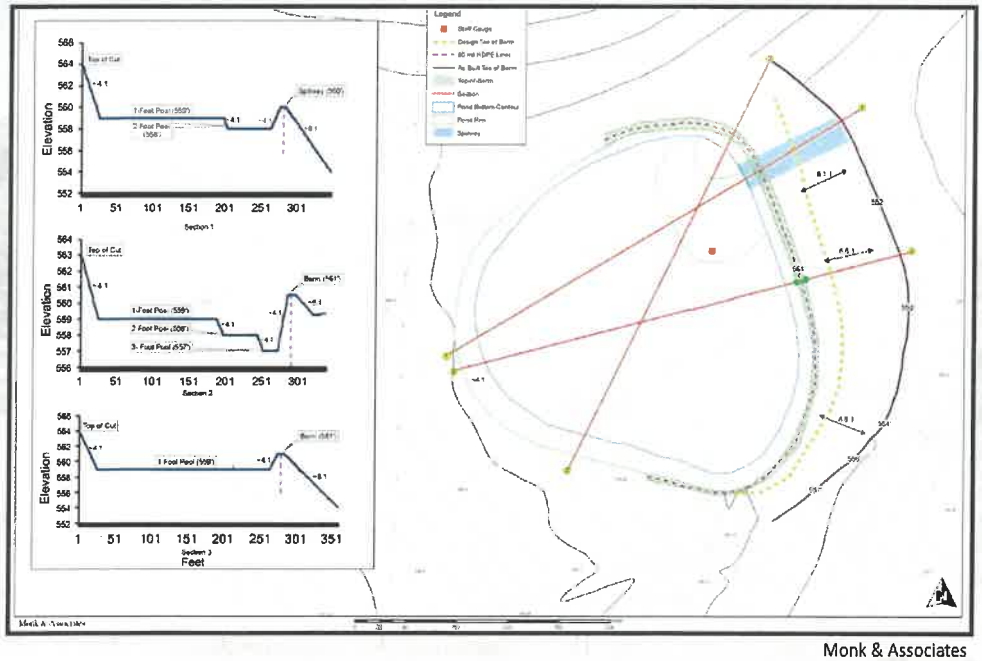
12

Exclusion

Fencing

13

Exclusion



HDPE liner

14

Exclusion

Photos by East Contra Costa Habitat Conservancy

HDPE liner

15

Exclusion

Photo by East Contra Costa Habitat Conservancy

Concrete slurry trench

16

Exclusion

Photo by East Contra Costa Habitat Conservancy

Concrete slurry trench

17

File #: 25-2563 **Agenda Date:** 6/23/2025 **Agenda #:** 5.

TRANSPORTATION, WATER & INFRASTRUCTURE COMMITTEE
Meeting Date: June 23, 2025
Subject: RECEIVE update from Public Works staff on hiring status associated with integrated pest management activities.
Submitted For: Chris Lau || Assistant Director | PUBLIC WORKS
Department: PUBLIC WORKS DEPARTMENT
Referral No:
Referral Name:
Presenter: Chris Lau || Assistant Director | PUBLIC WORKS
Contact: Chris Lau | (925) 313-7002

Referral History:
The Transportation, Water and Infrastructure Committee (TWIC) directed staff at the December 9, 2024 TWIC meeting to return in six months to provide a brief update on hiring status to track progress related to integrated pest management.

Referral Update:
In the last six months, Public Works has

- Recruited for the position of Vegetation Management Technician and filled one position;
- Filled one Senior Vegetation Management Technician position; and
- Entered into a contract with Civicorps, as a pilot contract for one year, to provide vegetation management services.

Another recruitment for Vegetation Management Technician will be announced in the coming quarter.

Recommendation(s)/Next Step(s):
RECEIVE update from Public Works staff on hiring status associated with integrated pest management activities.

Fiscal Impact (if any):
None.

File #: 25-3364 **Agenda Date:** 8/21/2025 **Agenda #:** 4.

Advisory Board: Integrated Pest Management Advisory Committee-Decision-Making Subcommittee
Subject: 4. REVIEW proposed draft revisions of the ground squirrel decision document and CONSIDER approval with suggested edits.
Presenter: Wade Finlinson
Contact: 925.655.3214

Information:
The bylaws of the Integrated Pest Management Advisory Committee (IPMAC) list several purposes of the Committee. Those include:

- Making policy recommendations upon assessment of current pest issues and evaluation of possible IPM solutions.
- Providing a forum for communication and information exchange among members in an effort to identify, encourage, and stimulate the use of best or promising pest management practices.
- Promoting transparency in pest management decision-making by County Departments.

Referral History and Update:
The IPM Decision-Making Subcommittee is currently the only standing subcommittee of IPMAC. In pursuit of the above purposes, the Subcommittee creates and revises documentation to transparently depict rationale for pest management decisions within County operations. These documents often include recommendations for operational refinement.

The last revision of the ground squirrel decision document was completed in 2019. Since then, regulatory restrictions on anticoagulant rodenticides has limited access to one of the two control tactics deemed “high efficacy” by the University of California Statewide Integrated Pest Management Program (UCIPM). The IPM Coordinator created a third draft of a new decision document after receiving input during the meetings of this Subcommittee held on April 17, 2025, May 15, 2025, and July 17, 2025.

Recommendation(s)/Next Step(s):
Staff recommends reviewing the attached third draft of this version of the decision document and approving it with any additional modifications and forwarding to the full Committee to discuss on September to pursue prior to the next meeting (scheduled for September 18, 2025 at 10:00 AM).

DRAFT

Contra Costa County
DECISION DOCUMENTATION for GROUND SQUIRREL MANAGEMENT

Date: 8/21/2025 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.

The problem species has been identified as the following:	**California Ground Squirrel** (*Otospermophilus beecheyi*) 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** Contra Costa County Administrative Bulletin #542 "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." **Airports Division** (Airport infield surfaces, runway safety areas, taxiway safety areas, grazing areas, habitat management lands, etc. at Buchanan Field & Byron Airports): Section 9.2.b of the Federal Aviation Administration (FAA) *Wildlife Hazard Management at Airports*[ii] describes habitat modification and exclusion practices. 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. **Public Works Maintenance Division** (dams, levees, creeks, basins, roads, bridges, flood control structures, retaining walls): Inspectors from U.S. Army Corps of Engineers (USACE) and state agencies have discretion to determine whether damage caused by burrowing animals on dams and levees is problematic. ~~Generally, the Division aims to maintain a squirrel-free area on and within 100 feet of dams and levees.~~ **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): 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.

What is the process for how sites are monitored for ground squirrel activity?	**Airports Division**: 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. **Public Works Maintenance Division**: 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. **Public Works Facilities Services Division**: 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. **Department of Agriculture/Weights & Measures:** 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/** **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.**  Note: Ground squirrel activity may vary by region. This variance may affect management windows.

Which cultural controls were considered?	**Habitat modification:** 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. Deep Ripping: Using tractor-mounted ripping bars where burrow entrances are present in order to reduce the likelihood of ground squirrel reinvasion. **EFFICACY:** Low **CONCLUSIONS**: **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. **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. **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. **Agriculture Department:** These services are not offered through existing programs within the Department. **Statement on efforts to prevent impacts on non-target species:** Deep ripping could impact species of concern. Guidance from the Public Works Environmental Services Division is recommended when considering habitat modification tactics.
Which physical controls were considered?	**Burrow modification**: Cement and grout: Injection of concrete, grout, or similar materials into burrow entrances. The Burrow Blocker: A patented system that injects a sand and water slurry into burrows. **Shooting**: The use of small caliber rifles to dispatch ground squirrels causing damage to critical infrastructure. **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. **Exclusion**: Includes a variety of materials installed in a manner that limits access to particular areas. **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.) **CONCLUSIONS**: **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. **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 covered with suitable materials while the Division adapts to recent rodenticide restrictions. **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. **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. **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. **EFFICACY:** Low

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Which chemical controls were considered? ~~(an accompanying section referencing the Pesticide Risk Footprint Tool is under construction)~~	*Toxic Baits:* **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. **Diphacinone or Chlorophacinone-treated grain bait:** First generation anticoagulant rodenticides are no longer accessible to most County-managed properties unless existing exceptions are further researched or applicable legislation is amended. ~~**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.~~ *Burrow fumigation methods:* **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. **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. **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. **EFFICACY:** High **CONCLUSIONS:** **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. **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. **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. **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. **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.

DRAFT
 	
Recommendations from the IPM Advisory Committee
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	  • Collaboration with UC partners in facilitating research that furthers understanding of the impacts and efficacy of under-studied management strategies.
	  • 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:
	  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.
	  2. Inform the potential development of operational staff or contractors performing long-term trapping operations where feasible.
	• 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:
	  • 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.
	  • 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.

Staff Report

File #: 25-3365 **Agenda Date:** 8/21/2025 **Agenda #:** 5.

Advisory Board: Integrated Pest Management Advisory Committee-Decision-Making Subcommittee
Subject: 5. REVIEW the grazing decision tree and ADVISE staff on possible revisions
Presenter: Wade Finlinson
Contact: 925.655.3214

Information:
The bylaws of the Integrated Pest Management Advisory Committee (IPMAC) list several purposes of the Committee. Those include:

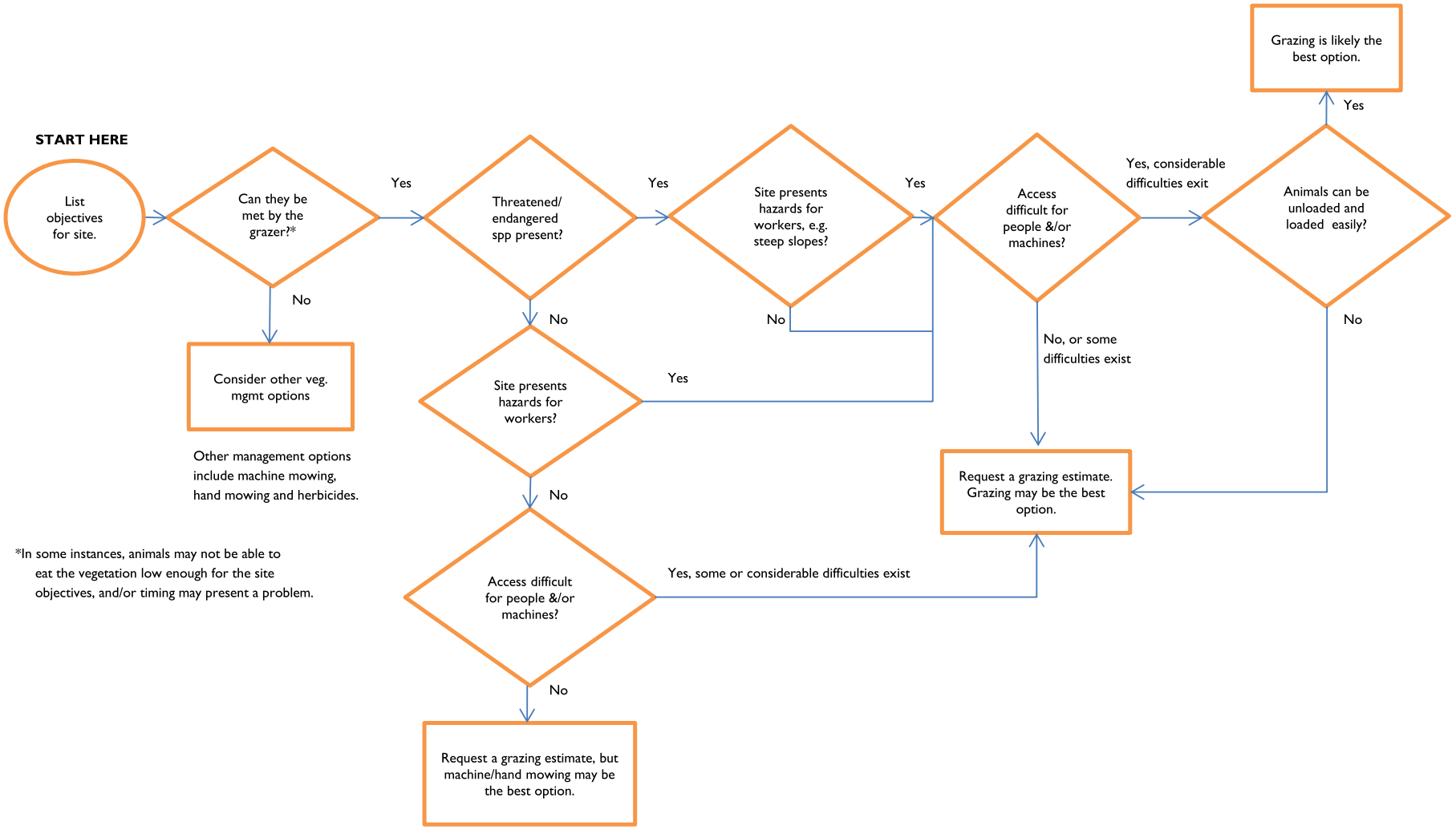
- Making policy recommendations upon assessment of current pest issues and evaluation of possible IPM solutions.
- Providing a forum for communication and information exchange among members in an effort to identify, encourage, and stimulate the use of best or promising pest management practices.
- Promoting transparency in pest management decision-making by County Departments.

Referral History and Update:
The IPM Decision-Making Subcommittee is currently the only standing subcommittee of IPMAC. In pursuit of the above purposes, the Subcommittee creates and revises documentation to transparently depict rationale for pest management decisions within County operations. These documents often include recommendations for operational refinement.

The *Public Works Vegetation Management Decision Tree for Grazing* was created in 2015 and has not been revised since. It appears that it only applied to flood control parcels managed by the Maintenance Division and primarily focused on hired targeted grazing herds typically comprised of goats and sheep. It does not mention the process for considering traditional cattle grazing leases which are also used within various County operations.

Recommendation(s)/Next Step(s):
Staff recommends reviewing the attached decision tree and advising on potential revisions.

Public Works Vegetation Management Decision Tree for Grazing
Revised 8-18-15



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A Guide to Livestock Leases for Annual Rangelands

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For landowners and managers with little direct experience in livestock grazing, some guidance in developing grazing leases can significantly help with meeting management objectives and avoiding pitfalls (sidebar 1).

Sidebar 1: Grazing Lease versus License

In legal terms, typical grazing leases are more accurately described as licenses, as a lease implies that the lessee holds exclusive rights to occupy the real property for the duration of the lease, while what are typically termed "grazing leases" usually have several restrictions and often do not include exclusive occupancy rights. Licensing also implies more specific uses of the land, cooperation to complete related work products, and expectations for specified management. Grazing licenses are gaining popularity now. However, because "lease" is the term usually used to describe grazing licenses, we will continue to use that term in this publication.

Even for those who have experience administering grazing leases, it is worthwhile to review the lease's terms and conditions. Some lease terms and conditions may hinder the desired management; these should be modified or deleted to foster improved management. The goal of this guide is to provide a reference for people responsible for developing and overseeing grazing leases on public and private lands. This guide will also be useful for livestock producers who are negotiating grazing leases, so they may better understand the goals and constraints of lessors and why they may require certain lease terms and conditions.

A livestock grazing lease on annual grasslands can provide revenue and important stewardship benefits for public or private landowners (lessors). Livestock grazing can improve the land's health through control of invasive plants, enhancement of wildlife habitat, protection of watershed functions, and reduction of hazardous fuel levels. In addition to revenue and resource management, a grazing tenant or rancher (lessee) can also provide resource stewardship (sidebar 2).

Cattle grazing lease to support native biodiversity.

Sidebar 2: Incentivising Stewardship

Stewardship, in the context of grazing leases, is a guiding principle and set of activities practiced by ranchers that support conservation and sustainability of the rangeland. Many ranchers conduct management that preserves the integrity, stability, and beauty of the biotic community of the lands, and thus sustains yields and maintains profitability (Leopold 1949). Here we integrate this principle with grazing leases to explicitly incentivize rancher cooperation and sustainability of the rangelands and the livestock operations. Additional stewardship objectives and activities that differ from standard leasing activities primarily focused on livestock production can be added, such as those described in the group of tables 2A through 2E.

Sheep grazing lease to reduce fire fuel loads.

For public agencies or private landowners that manage lands with limited or no staff, the grazing lessee with their frequent visits to check and manage livestock can be a much-needed extra set of eyes on the land, alerting the agency to any number of issues—livestock-related or not—including vandalism, trespass, homeless encampments, illegal growing sites, wildfire ignitions, or natural resource observations. The grazing lessee may also report on infrastructure maintenance needs such as road and fence problems. While not all these benefits will address the goals of a particular landowner, many landowners will find that the benefits of a grazing lease including the stewardship provided by a lessee are important in helping them maintain and improve their property. The benefits from a livestock grazing lease beyond revenue all imply that a relationship between the lessor and lessee is more cooperative than a mere business transaction for forage resources.

The recommendations in this publication should help the landowner (lessor) and the grazing tenant (lessee) develop leases that satisfy a variety of situations and objectives, including sustainability of natural resources, cash flow for property management, viability of the grazing business, and the operational functions of both the lessor and lessee. Both parties should have a clear understanding of the lease parameters before reaching a final agreement, and, to protect both parties, agreements that are only verbal should be avoided. In all cases, the lease should be a written document that helps to prevent misunderstandings and unnecessary legal fees at a later date. It is important to remember that grazing leases are legal documents and all parties should consult with attorneys for legal advice.

SETTING GOALS AND OBJECTIVES

Developing clear and effective management goals and objectives is a critical part of understanding how livestock grazing can be used to meet these goals and objectives; and it may also help determine whether or not alternative or additional management tools are needed. Goals for grazing management should be stated up front, assisting in lease development while increasing cooperation from the lessee. See sidebar 3 for examples of grazing management goals. This will also aid when evaluating compliance and effectiveness.

Sidebar 3: Examples of Grazing Management Goals

Purpose Statements that Support Multiple Use

Example A: Entity or Landowner X provides this lease for the grazing of livestock and to meet management objectives listed below in order of priority:

- Provide visitor access and recreational opportunities.
- Provide for the safety of park users.
- Preserve and enhance natural plant and wildlife communities and protected species and their habitats.
- Minimize fire hazards to the premises and adjacent private property by managing vegetative fuels.
- Manage grazing and livestock to economically sustain livestock production for continued use as a resource management tool.
- Establish cooperative relationships with adjacent property owners.

Example B: It is the intent of Entity or Landowner X that the land be utilized for multiple use, including—but not limited to—utility, grazing, wildlife habitat, recreation, and soil and water conservation. Lessee is required to participate in a conservation and maintenance program as outlined in the resource management plan. The conservation and maintenance measures are intended to provide for the long-term productivity of the grazing area while protecting natural resources and permitting a reasonable economic return to Lessee.

Example Statements for Specific Resource Management Goals

Example A: The purpose of this agreement is to maintain and enhance a remnant stand of purple needlegrass *(Stipa pulchra)*, as well as other native perennial grass species and associated native forbs. In order to reduce competition from exotic annual grasses and forbs, livestock grazing in the winter and early spring will be used pursuant to this agreement.

Example B: The purpose of this agreement is to manage a coastal prairie to maximize species richness and cover of native annual forbs and native perennial grass species currently occurring on this site. Livestock grazing as prescribed by the grazing management plan and in accordance with this agreement will be used to reduce vegetation height and minimize litter depth. Livestock grazing should also help to maintain the "open prairie condition" of this site by impeding the invasion of woody plants from the neighboring coastal scrub community.

Example C: The purpose of this agreement is to provide managed annual grassland as optimal foraging, roosting, and breeding habitat for burrowing owls and aestivation habitat for species of concern. Optimum habitat conditions for species of concern will be provided by reducing grass height and biomass on conservation land, as specified in the grazing management plan. Excess vegetation will be removed by managed livestock grazing pursuant to this agreement and in accordance with the terms and conditions listed below.

Example D: The purpose of this agreement is to manage wildlife habitat by providing cover and browse for deer and increasing recruitment of bitterbrush. Grazing should reduce competition of annual grass and create hoof impact to increase bitterbrush recruitment.

Example E: The purpose of this agreement is to provide shortgrass pasture as forage for wintering geese on selected fields. Excess vegetation will be removed by managed livestock grazing pursuant to this agreement.

Specific management objectives or terms of the monitoring program (such as performance standards) should be included in the lease if there is not an accompanying grazing management plan. If there is a grazing management plan, it should be referenced explicitly in the lease document and may be used as a tool for adapting management to meet changing conditions and needs.

Public and nonprofit land managers may have goals and objectives spelled out in law, regulation, policy, local ordinance, conservation easement, or by a board of directors. A private landowner may have more freedom in developing goals and objectives. For instance, the former may need to provide for recreation opportunities while the latter may need a certain level of cash-flow. However, all landowners are likely to have areas of common interest, like fuels management and invasive species control.

RESOURCE INVENTORY
(Financial, natural resources, infrastructure, and forage)

In conjunction with identifying goals and objectives, critical steps in lease development are understanding the financial resources available to perform management and assessing the location and conditions of both natural resources and grazing infrastructure.

Financial resources may be provided by the landowner or manager, the grazing lessee, or a granting organization such as a nonprofit or government agency. Funds from third parties may be provided to support conservation or

other resource management objectives such as fuels management or carbon sequestration.

An inventory of natural resources should include an assessment of forage, water, sensitive special-resource areas (including the habitat of special-status species and natural communities), erosion sites, and invasive plants. Natural resources including available forage, invasive plants, topography, and water resources may limit or determine the kind (species) and the class (age/sex) of grazing animals that are most suitable to graze the property. Management of the sensitive special-resource areas or invasive plants might require targeted grazing or temporary exclusion, which could require additional fencing and labor costs. To complete this inventory and analysis, the lessor needs to understand the productive capacity of the rangeland and the opportunity for, and cost of, range improvement practices (see Bush et al. 2006 and Vallentine 2001 for additional information on performing a rangeland analysis).

Infrastructure that should be evaluated includes fences and gates, roads, corrals, watering systems, servicing facilities, and barns. Additionally, at the time of the inventory, note deficiencies that should be corrected, maintenance that is required, and opportunities for improvements that would aid in achieving resource management goals. Decide who is responsible for grazing infrastructure improvements and repairs based on the inventory and identified needs. Infrastructure may also limit or determine the kind or class of animals that can most readily graze the property.

Estimating number of livestock. The productivity of forage as well as the availability and distribution of water will determine the number of livestock that can be grazed (stocking rate) on the property over the desired period of time. Stocking rate is often expressed in animal unit months (AUM), a standardized unit of forage that can be used to estimate the number of livestock per period of time in a way that allows relatively simple conversion between kinds and classes of livestock, although actual capacity can vary through the year. Table 1 provides an estimate of Animal Unit Month equivalents for selected kinds and classes of livestock.


Photo: S. Barry

Fall calving on private, leased land.

The stocking rate should be provided as an initial estimate or guideline, recognizing that annual forage production varies from year to year, and flexibility is necessary to meet grazing lease objectives and effectively manage forage resources and support livestock production. An accompanying grazing management plan, if available, would provide more specific information about adjusting stocking rates to meet grazing lease objectives. In general, the stocking rate will be adjusted from year to year based on monitoring of the forage throughout the grazing period. Monitoring forage production, utilization, or residual dry matter (RDM) will inform decisions to reduce stocking rates, provide supplemental feed when forage is short, or increase stocking rates when surplus forage is available. It is also essential for determining when a field supporting special resources (special management areas) is ready for livestock to be moved in or out or to concentrate for targeted grazing. At the end of the grazing period, if the grazing use is too much

Table 1. Animal Unit Month (AUM) equivalents by kind and class of livestock

Kind/class of livestock	AUM equivalent
mature cow with nursing calf	1.00
bull	1.25
bred heifer	0.75
yearling steer or heifer	0.50–0.75
horse	1.20
mature ewe	0.20
mature goat	0.15

Source: Heady and Child 1994. (But see also NRCS 2003 and Vallentine 2001 for similar estimates.)

or too little, adjustments can be made the next period.

There are several methods for determining an initial stocking rate estimate or guideline for an area:

- *Historical Stocking Rate:* Historical data on livestock numbers and time of use can provide an estimate of practical stocking rates. This assumes that past numbers of livestock grazed on the land (or on a similar piece of land), provided acceptable levels of use, and are therefore good estimates of the grazing capacity. The type of livestock to graze is determined by many things, including the landowner's goals, facilities, size of property, soil type, forage composition, etc.
- *Rancher Experience:* Ranchers who have grazed properties for many years have learned the number of cattle or sheep that can graze an area during different weather years and within special resource areas. Obtaining information from ranchers or other knowledgeable people is one of the best starting points for estimating livestock grazing and production capacity of certain rangelands.
- *NRCS Soil Surveys:* In the absence of historical data or local knowledge, estimates of average forage production can be found in soil surveys, soil-vegetation surveys, and USDA Natural Resource Conservation Service (NRCS) ecological site descriptions. The NRCS Web Soil Survey (https://websoilsurvey.sc.egov.usda.gov/) has a tool that computes an estimate of forage production under different weather years (good, fair, and poor forage production) for a defined property.
- *Ecological Site Descriptions:* Ecological sites provide a consistent framework for classifying and describing rangeland and forestland soils and vegetation; they thereby delineate land units that share similar capabilities to respond to management activities or disturbance. Ecological Site Descriptions are available from the USDA NRCS (https://esis.sc.egov.usda.gov/Welcome/pgReportLocation.aspx?type=ESD), although there are only a few descriptions currently available for sites in California.
- *Monitoring Actual Forage Production:* Sampling actual forage production over the area to be leased through a number of years can provide a good estimate to use for determining stocking rates in the absence of other information. This method takes time, both in terms of labor hours and repeated sampling over years to get a good estimate of forage production variability as well as average production. Annual and seasonal fluctuations in quantity and quality of forage produced per acre (due to weather) can make it difficult to predict numbers of livestock suitable for a management unit. Yearly variation in forage production may vary from twofold to fourfold, but the estimate of grazing capacity is usually stated as a conservative average over a number of years.

Based on goals and objectives and resource inventory, the lease or associated plan should state the following: any limitations on the kind or class of grazing animal, estimates of carrying capacity or how many grazing animals the land can support, and expected grazing season.

FINDING LESSEES

Advertising for lessees may depend on the management goals and objectives as well as the lessor's familiarity with the ranching community. In some cases, word-of-mouth can be sufficient to identify a desirable lessee. This could be done by talking with neighbors or asking the local UC Cooperative Extension livestock advisor or local livestock association. In other cases, it may be desirable to advertise in the newsletter of an organization that may have suitable lessees as members or subscribers, such as the local Cattlemen's Association, Farm Bureau, California Wool Growers Association, California Rangeland Conservation Coalition, or the Central Coast Rangeland Coalition.

When selecting a lessee, consideration should be given toward the applicant's qualifications and past experience to ensure that they have the capacity and ability to meet lease requirements and achieve the lessor's goals and objectives. This may involve asking for

lessors to achieve similar objectives, asking for references from their other current or past lessors, and asking for descriptions of how they would achieve the lessor's specific goals and objectives.

LEASE RATES AND TERMS

There are a number of terms that must be included in order for a lease to function as a legally enforceable contract. In addition, there are provisions that may be desirable to include in the lease to better meet resource goals and objectives or to facilitate management of the property in an efficient and mutually agreeable manner. These may include provisions that incentivize stewardship of the land by the livestock producer or that share risk—such as variability in steer prices—that is inherent in range-based livestock production between the lessee and the lessor.

Often, revenue generation is only one of the goals of a livestock grazing lease for the landowner or land manager. When other goals are involved, setting the lease rates and terms may be more complex than simply awarding the lease to the producer willing to pay the highest price or a market rate. In these cases, it is worth spending time to consider what payment structure to adopt. Even when the payment structure will be determined by law or policy, it is worthwhile to consider the implications of the given structure so that any unintended consequences could be avoided, such as financial hardship that results in overstocking or deferred maintenance. There are three major considerations in developing a grazing lease:

- the unit to base the lease rate on [animal unit months (AUM), or acres grazed, or a flat rate for a parcel or tract)]
- the amount to charge per unit and how this may be set or adjusted
- the length or term of the lease

METHOD OF CHARGING FOR THE LEASE

Local tradition and past experience often influence whether a lease rate is charged *per AUM, per acre, per whole tract,* or *paid on gain*, as described below. The method chosen should best fit the needs of the parties involved. While these illustrate the methods for charging for grazing use, there are often other exchanges, whether explicitly or implicitly made, that occur in the context of the grazing lease.

Per AUM. The most commonly used method by many public landowners is to charge by AUM. An AUM is defined as the amount of forage required by a mature cow and calf for 1 month, and it has a set of equivalents for other kinds and classes of livestock (see table 1). For example, a field rated at 100 AUMs could support 10 cows for 10 months, 50 cows for 2 months, or 125 sheep for 4 months.

The lease rate per AUM may be based on a fixed amount or on an index that accounts for variations in the local livestock market (see the variable income approach below). The advantage of an AUM rate is that lessees pay for what they use. If drought shortens the grazing period or the lessor requires the rancher to reduce the number of head, the total payment is reduced accordingly. Disadvantages include that the lessee may have little incentive to improve the productivity of the land or optimize livestock distribution through range stewardship and that too little grazing might occur (and thus conservation objectives are not met) if the lessee does not keep as many livestock at the property as the owners would prefer. In this arrangement, the lessor is also not guaranteed a specific lease value. Some lessors may require a minimum lease payment regardless of the AUMs used.

Per Head. A simplified version of per AUM is per head for a month or for a grazing period, while specifying the kind and class of livestock (for example, $120 per cow-calf pair for the grazing period). The rate is based on the type of livestock being grazed—cows and calves, stocker cattle, replacement heifers, sheep, or horses. Similar to the per AUM method, lessees only pay for what they use, so lessors assumes some of the risk of variable annual forage production.

Per Acre. Charging a fixed rate per acre, rather than per head, can provide an incentive

to improve productivity and distribution, but it can expose the livestock producer to risks when low forage production years result in lower grazing capacity but not a lower lease rate. A potential remedy to this could be to charge per acre, per month, so that if the grazing period is shortened due to low productivity, the cost to the lessee also goes down. A flat rate approach should be combined with performance standards and a long-term lease. If the lease term is short (less than 3 years or so), the lessee might overutilize the forage resources or otherwise misuse resources of a property and then leave. Negative incentives may be further increased with this method if the lease rate is set through a competitive bid process that awards the lease to the highest bidder without defined performance standards or experience criteria. While this method has apparently led to excessive stocking and overgrazing in the past, it can be implemented with stocking limits, performance standards, and stewardship requirements to minimize such unintended effects.

Per Whole Tract. In some cases, a single fee may be charged for the entire parcel for the specified time period, referred to as a whole tract rent. This may be more common in cases with a lease in the more traditional legal sense (see sidebar 1). This is normally used when leasing an entire ranch for a period of years or when a mixture of land types is leased together (e.g., range, cropland, pasture, forest). This payment method may also be an effective method for leasing small parcels with simple leases. Depending on the goals for the property, it can be important to utilize performance standards and long-term leases with this approach.

Paid on the Gain. This applies to seasonally grazed, weight-gaining livestock such as stocker cattle, replacement heifers, or feeder lambs. This approach can be attractive to landowners who are interested in taking on the extra risk and potential extra return that results from sharing risks of variability in weather, livestock production, and market prices with the livestock producer. The livestock should be weighed at a certified scale, before and after grazing occurs. These rental charges may consist of a preestablished, charge per pound of gain (e.g., $0.40) or a share of the total weight gain (40–60%) for the grazing period.

SETTING THE LEASE RATE

Lease or rental rates on agricultural property are typically based on the property's value for agricultural crop production. This value is determined by economic forces of supply and demand for agricultural land and its potential agricultural crop productivity, not on other factors influencing land values such as potential for development. The production value of rangeland is influenced by the relative profitability of the livestock industry in the region, the supply and cost of alternative sources of feed, the feed-producing capacity (quantity and quality) of the grazed property, access to the site's forage (including the availability of livestock water), the local demand for forage resources, and conditions of the lease agreement. However, rangeland leases are unique in that the grazing lessee may pay rent based on the land's agricultural value, while the lessee is also often a vendor for infrastructure construction/maintenance and other conservation services, as well as being a partner who collaborates in planning, stewardship, and public relations. In the final analysis, the agricultural rate should often be discounted based on the "value-added" noncash contributions of the lessee as a cooperating conservation service provider, vendor, or partner.

There are various ways to approach the rental rate to charge in a grazing lease, from referencing local market rates to establishing a formula, incorporating the methods of charging by units and other factors affecting lease value as described above.

Four reasonable approaches to establishing rental rates are the following:

- market value based on what others charge for land of similar quality
- market value based on qualifications or discounted for stewardship services
- variable income index
- flat rate (including the per acre method described in the previous section)

Market Value. The market value approach is based on determining the local rental values for similar rangelands. An estimated average value or a range of values are available in some *Annual Crop Reports* published by each county's Department of Agriculture, and values by county and region are also reported by the American Society of Farm Managers and Rural Appraisers. Such information should be analyzed for its application to a specific site's condition, including considerations for percent nonwoody and grazable or quality of the forage.

Market rates may also be set through a competitive bid. One effective competitive bid approach that also provides for a lessor's desire for rangeland stewardship is to have a double bid, in which applicants bid the amount of rent they will pay and separately submit a proposal with their qualifications and any services they will provide beyond the minimum requirements. Caution: the lessor should not necessarily take the highest bid, since that lessee will have greater pressure to remove as much forage from the land as feasible to compensate for the higher fees or to assure that the lease agreements are kept.

Market Rate Based on Qualifications or Discount for Stewardship Services. Similar to the competitive bid described above, this approach allows applicants to propose a lease rate; however, required stewardship services and minimum qualifications are described by the lessor in a request for proposals (RFP). Responses to the RFP are evaluated based on the entire proposal, including the qualifications and experience of the applicant, proposed management and stewardship services, as well as the proposed lease payment. Like a straight competitive bid, an important consideration when evaluating these kinds of proposals is to consider whether the overall proposal is likely to be financially feasible for the applicant, given the level of effort proposed and the lease payment. This approach to setting a lease rate may be appropriate for leases with multiple or complex management objectives; it can account for the qualifications and willingness of individual applicants to engage in stewardship activities that are related to—but would otherwise fall outside the scope of—simple livestock production.

Variable Income Index. Some lessors use an annual variable rate based on a livestock price index. Variable rates attempt to approximately reflect potential income of the livestock producer on the property. Livestock prices from nearby sales, video auctions, or market reports may provide a basis for the price index. (For example, see Midpeninsula Regional Open Space District 2018). The index may be developed from a long-term average over fixed months. For example, the average price for 700-pound steer calves in May, June, and July may provide a price for the index. An index used by some public agencies in California provides for a $0.05 increase in the AUM lease rate for every $0.50 increase in average calf price.

Setting the Final Rental Rate. After establishing a forage or base rental value, additional items should be considered before the final rental rate and method of payment can be settled. If a property owner requires the lessee to provide vendor or partner services such as infrastructure development or maintenance, extensive monitoring, frequent movement of livestock on and off or between fields, habitat management or other management time, this can be accounted for with rent credits to reduce the lease payment, a common practice on conservation lands. The amount of liability insurance required should also be taken into account when setting the final rental payment. For example, agencies that require over a $2 million insurance policy may cause a hardship for certain livestock producers. The same would be true for small-acreage leases lacking economy of scale, and any leases with difficult access, if the rate is otherwise set to a standard rate that is used for more easily managed parcels. The lease rate should take into consideration the lessee's role as a partner, access issues, the type and weight gains of livestock, numbers of livestock (stocking rate), and grazing period. The lessor may set the final rental rate either after negotiation with a lessee or after determining the amount of income needed from the property.

Table 2A. Administration and coordination activities in a lease

Management activities	Beneficiaries		Responsible party		
	Stewardship	Livestock production	Landowner	Livestock producer	
				Standard lease term	*Potential fee credit or compensation*
Develop goals and objectives, and resource and grazing management plans for incorporation into the grazing lease.	✔	✔	✔		
Manage lease agreement.	✔	✔	✔	✔	
Maintain timely communications between the landowner and lessee.	✔	✔	✔	✔	
Participate in administrative meetings with landowner and lessee to review monitoring results, including compliance with management plans; review and recommend adjustments to management activities as well as adaptations to management plans; plan subsequent year; and complete required reports and other communications.	✔	✔	✔	✔	
Conduct project management and contract administration.	✔	✔	✔		
Consult with landowner as requested on grazing management, operations, infrastructure, planning, monitoring, and conservation issues.	✔	✔		✔	
Maintain appropriate insurance for liability and workers compensation, including any additional coverage needed for working in the vicinity of livestock.	✔	✔	✔	✔	

Table 2B. Infrastructure activities in a lease

Management activities	Beneficiaries		Responsible party		
	Stewardship	Livestock production	Landowner	Livestock producer	
				Standard lease term	*Potential fee credit or compensation*
Construct new and replace depreciated infrastructure at the end of its expected lifespan.		✔	✔		✔
Maintain existing essential infrastructure to ensure effective function and ability to last its expected lifespan.		✔		✔	
Maintain stock ponds for both watering and habitat.	✔	✔	✔		✔
Clear blocked culverts and drainage dips on dirt access roads.	✔	✔	✔		✔
Maintain primary and other useful dirt access roads.	✔	✔	✔		✔
Replace or repair infrastructure damaged due to nonlessee vehicle accidents and vandalism.	✔	✔	✔		✔
Replace or repair all damage to infrastructure caused by lessee's livestock.		✔		✔	

Table 2C. Grazing management and livestock care activities in a lease

Management activities	Beneficiaries		Responsible party		
	Stewardship	Livestock production	Landowner	Livestock producer	
				Standard lease term	*Potential fee credit or compensation*
Gather, handle, and move livestock.		✔		✔	
Move livestock to designated locations or otherwise to achieve the specified grazing objectives.	✔	✔		✔	✔
Manage salt and supplement placement in accordance with the grazing management plan to achieve desired livestock distribution.	✔	✔		✔	
Maintain health of livestock, including administering necessary vaccinations, branding, and health certifications.		✔		✔	
Manage and remove any problem livestock (e.g., aggressive, diseased).		✔		✔	
Remove any livestock carcasses in a timely manner and dispose according to local ordinances.		✔		✔	
Carry out livestock-predator conflict avoidance management.	✔	✔		✔	✔
Patrol to assess and respond to infrastructure and resource conditions and livestock escapes.	✔	✔		✔	
Address nonlessee livestock trespassing on the leased land. The lessee may have special expertise and resources to address this.	✔	✔	✔		✔

Table 2D. Conservation activities in a lease

Management activities	Beneficiaries		Responsible party		
	Stewardship	Livestock production	Landowner	Livestock producer	
				Standard lease term	*Potential fee credit or compensation*
Remove or clean up abandoned fence, equipment, trash, and debris.	✔		✔		✔
Conduct targeted grazing or exclusion for maintenance and enhancement of special habitats (special-status plants or wildlife, riparian woodland, ponds, wetlands, native grasses, or oaks).	✔		✔	✔	✔ (This may be integrated into the grazing management plan, or it may be additional services that could be provided by the lessee that go beyond the scope of the lease.)
Control invasive plants and fire hazards, and conduct other special resource projects. Activities might include herbicide application, construction, manual work, and specialized equipment work.	✔		✔		✔
Conduct other activities not part of a "normal" grazing lease for regular or one-time purposes (construction, manual work, and specialized equipment work).	✔		✔		✔
Participate in educational events and visitor relations organized by the landowner.	✔		✔		✔

Table 2E. Monitoring activities in a lease

Management activities	Beneficiaries		Responsible party		
	Stewardship	Livestock production	Landowner	Livestock producer	
				Standard lease term	*Potential fee credit or compensation*
Conduct compliance monitoring for adherence to grazing lease terms and conditions (livestock numbers, season of use, distribution, infrastructure maintenance, RDM or allowable use standards).	✔	✔	✔		
Conduct effectiveness monitoring for assessing whether grazing management is achieving goals and objectives (vegetation composition, soil health, rare plant populations, invasive plant populations).	✔	✔	✔		✔
Implement and comply with Best Management Practices (BMPs) for water quality where appropriate.	✔	✔	✔	✔	
Make general "naturalist" observations of sightings of unusual wildlife, plants, natural events (weather, wildflower displays, wildfires, new pest plant infestations, insect infestations, landslides, tree-falls, high/low streamflow, etc.) or other things of interest, and provide periodic reports.	✔	✔	✔		

OTHER LEASE TERMS AND CONDITIONS

Leases may be as complex or as simple as needed to fit the situation. Depending on the resources available, management goals and objectives, and capabilities of the grazing lessee, there are many potential terms and conditions that may be adopted and responsibilities assigned to the lessor or the lessee, with potential provisions for fee credits or other compensation depending on the situation. The group of tables 2A through 2E lists common management activities by topic (administration and coordination, infrastructure, grazing management and livestock care, monitoring, conservation) that may be addressed (and should be addressed, especially when rent credits will be offered) in the lease terms and conditions. As indicated in the tables, some of these activities have benefits that fall primarily to conservation objectives or livestock production, while others have benefits for both conservation and livestock production goals. Tables 2A through 2E also indicate whether the activity is typically assigned to the lessor or lessee for responsibility and whether, if it is assigned to the lessee, it is reasonable to provide for a fee credit or other compensation. While many circumstances may need to be addressed in a grazing lease agreement, the following key terms should be defined:

General Terms of the Lease. A lease must include the names of the involved parties; description of the location; number of total and grazable acres involved; vegetation types and conditions; topography, class and number of livestock that are acceptable; type of lease (continuing, annual, or other period); start and end dates of the lease; method of payment; and such legal terms as necessary (reviews, amendments, transfer of property, right of entry, conditions for termination, etc.).

Length of Lease. Long-term leases (minimum 5 years) are generally favored by both landowner and lessee. Long-term leases give the lessee a long-term commitment to the property and encourage proactive and committed stewardship. Multiyear lessees are more likely to make investments in rangeland improvements and to perform stewardship and maintenance activities beyond the lease requirements because of the expected returns over the years. This provides an incentive to maintain sufficient RDM, which protects soil from erosion and enhances the subsequent year's forage production. In addition, livestock that graze a property learn the landscape and retain memory of the locations of forage and

water sources, even on seasonal grazing leases, when the same animals return in subsequent years. This makes management simpler, especially on larger pastures. Short-term leases reduce certainty that efforts to maintain infrastructure or forage resources will be recouped in subsequent years of grazing and thus may result in poor management and overuse. However, a short-term lease may be desirable in specific situations where there is a known change in land use or ownership planned for the near future, but livestock grazing for revenue or stewardship objectives are still desired in the short term.

Long-term leases make lessees eligible for USDA Environmental Quality Incentive Program (EQIP) funding for rangeland improvements, allowing a lessor to leverage federal funds. To qualify for EQIP, lessees must have a lease secured for the length of the EQIP contract, which is generally 3 to 5 or more years.

Leases should include performance standards allowing the lessor to terminate the lease if the lessee fails to meet minimum standards. Leases should also allow the lessor to extend the lease if the tenant has provided excellent stewardship, to be determined at the discretion of the lessor. This encourages high levels of stewardship and allows the lessor to retain a tenant who has been successful and easy to work with. This can be limited to a one-time extension of 5 years, rather than unlimited extensions, if the lessor desires lessee selections to be made periodically on a competitive basis.

Termination of Lease. The lease should address what will happen if things go wrong. The lease should also state what happens in case of emergency, such as drought, wildfire, mass animal health problems, or personal illness. Will lease payments still be due in this situation? The lease should state what would be cause for early termination or discontinuing the lease, such as repeated failure to meet the specified performance standards or complying with other terms of the lease. In the case of an early termination of the lease, there should be a formal time between the notification of the lease termination and when all livestock, equipment, and materials must be removed from the property, such as 30 days from the notice of termination.

Administration and Coordination. Table 2A addresses several activities that should be included in the lease and grazing operations. Among these is the typical need for the lessee to carry liability insurance. There should also be provisions for communication between the lessor and lessee, including annual meetings or conference calls to discuss management needs, annual plans, and methods for communicating management information and instructions.

Insurance. Business liability insurance that names the lessor as an additional insured party should be required to help protect the lessor from liability arising from the grazing operation. In addition, if the lessee uses employees in the operation on the leased land, proof of workers compensation insurance should also be required.

Infrastructure. Current infrastructure for grazing management, grazing operations, and related stewardship, including structures essential to meeting the grazing goals, are described in table 2B. It is essential to describe in the lease the current conditions of existing infrastructure, what additional structures will be needed, how maintenance will be provided, and how and when any new construction and repairs will be provided. Provisions for maintenance and improvements can be negotiated in a lease so that they benefit both the lessor and lessee. Typically, the lessor is responsible for replacements and repairs, and the lessee is responsible only for maintenance up to the expected lifespan of each type of facility. The more assured a lessee is of lease renewal, the more incentive the lessee will have to manage the long-term productivity of the land and upkeep of facilities. Under a long-term (5 years minimum) lease, the lessee may assume the bulk of responsibility for maintenance and repair on all buildings, interior fences, gates, corrals, and water facilities as well as weed control to the satisfaction of the lessor. For short-term leases the lessor usually assumes major maintenance in addition to repair responsibilities. The cost of improvements, such as extensive weed control projects, fencing, and water developments, requires greater

capital investment and is usually shared by both parties when there is a long-term lease in place. The lessee and lessor will need to share responsibility to apply for federal cost-sharing projects.

Weighing Conditions. When grazing fees are based on weight gain, weighing facilities with proper holding and loading facilities should be provided by the lessor. This may require scales certified by the County Department of Weights and Measures. The conditions of weighing, such as times and preparation of weighing and who will be present, should be spelled out in the agreement.

Watering. Good quality water in good quality watering facilities in proper locations (generally dispersed in a manner that encourages utilization of the entire pasture) improves performance of livestock and use of rangelands. When water supplies dry up or facilities malfunction, provisions must be made to supply water or move livestock. If this occurs through no fault of the lessee, then such costs should be covered by the lessor. Water availability and expectations for facility maintenance should be spelled out in the lease agreement. Long-term structures, such as wells, should be maintained by the lessor.

Livestock Care. Table 2C, covering grazing management and livestock care, outlines responsibilities for the proper care of livestock, ranch employees, and security. Considerations should be given to lessees who have demonstrated good livestock health care practices and are headquartered within the geographic area or a specific regional area of the leased rangeland. Having a lessee who can respond quickly to an emergency is vital.

Diseases and Death Losses and Removal of a Carcass. If there is a death loss, the lessee will be responsible for disposing of the carcass in the manner specified, consistent with law and regulation, as well as consistent with the goals of the lessor. Carcasses can be safely left in place or covered with brush if it is situated away from natural waters or watering facilities and from sight or smell of neighboring residences and recreational facilities. Whether carcass burial would be acceptable (if feasible) should be specified. The burden of costs for such removal should be specified. The lessor and lessee should decide who assumes the costs resulting from excessive predation on livestock (as well as what means and notifications are acceptable for responding to livestock predation issues) and include this in the lease. If livestock producers are not allowed to use all legal methods to control predators and minimize losses, restrictions should be clearly stated in the lease.

Related to this is consideration of the presence of toxic plants on the leased property, whether currently present or potential for introduction. The lease should state whether management of these species would occur and, if so, who is responsible for management and what treatment approaches should occur. Similar to death-loss from predation, there should be a statement indicating whether the lessor or lessee is responsible for losses from toxic plant poisoning.

Supplemental Feeding. Supplemental feeding may be required to meet seasonal nutritional needs of livestock. For example, forage protein and/or energy levels in fall and winter months may be below maintenance requirements for specific classes of livestock. Hay or commercial supplements provide nutrients when they are deficient and replace forage when lacking. Care should be taken to move the feeding site each year if at all possible. Such locations should be monitored by the lessee for introductions of invasive plants, and the lessee should be responsible for actions to control any infestations. Moving the feeding site reduces localized heavy grazing, trampling, and potential compaction issues. It is reasonable to expect lessees to inspect hay and only use feed that is free of weeds unknown to the property; however, requiring certified weed free may not be reasonable because it is not readily available. The lessee normally pays for any supplemental feed.

Reasonable Use and Performance Standards. Maintaining the health and productivity of the rangeland resources are important considerations in grazing leases. RDM performance standards are often used as a quantifiable and verifiable measure to determine whether grazing achieved vegetation

management goals during the previous grazing period while providing soil protection for the next rainy season. An impartial third party can determine the level of RDM present or expected by fall in order to evaluate grazing utilization.

Performance standards normally are specified in a grazing management plan and referenced in the grazing lease. They should be based on specified management objectives to meet broader goals and should allow for a realistic level of variation both across the landscape and over years. If a lessee fails to meet a performance standard, there should be discussion and assessment with the lessor to understand why. Some performance standards are not realistic at a given site or would require additional infrastructure such as a water trough or fencing. Long-term monitoring should include the evaluation of the goals and objectives themselves; objectives found to be insufficient or overly restrictive in meeting goals should be revised. New goals and objectives may emerge due to invasive plants, climate change, new nearby housing or road developments, and other long-term changes.

Supplementary Conservation Services. Conservation services (for general land care, support of the land's "ecosystem services," and conservation purposes) are activities that the lessee may be asked to perform primarily for the benefit of land stewardship and specific conservation objectives, rather than livestock production (see table 2D). A lessor may have goals for maintenance and enhancement of special habitats (special-status plants or wildlife, riparian woodland, ponds, wetlands, native grasses, or oaks). These kinds of activities would typically involve reduced rental fees, rent credits, or other forms of compensation. If these activities are identified in the original request for proposals from potential grazing lessees, they may be expected to be performed with a rental fee that reflects the increased costs or reduced revenue for the lessee that would result from these activities.

Rent Credit. One method to support maintenance and improvement activities by the lessee that may be beneficial to both the lessor and lessee is the use of rent credits. Reimbursement or rent credit is provided to the lessee who conducts major repairs or installs new or replacement infrastructure deemed in advance to be necessary or desirable by the lessor. Options that should be negotiated include full reimbursement, reimbursement of up to a set percentage of the cost, rent credit up to a set percentage of the year's rent due, and rent credit for several years in a multiyear lease for expensive projects. Reimbursement may be preferable to rent credit if the lessor seeks to maximize the "income" side of the lessor's operating ledger, while rent credit may be preferable if the lessor seeks to minimize the "expense" side.

Special Clauses. Each lease should contain a means to modify the terms to address emergency situations, such as wildfire, drought, and flood. There should also be a way to change or terminate the lease when both parties agree. Restrictions on activities by the lessee, such as hunting or fishing, nonlivestock enterprises, recreational access, and tree cutting and selling, should be stated in the lease.

MONITORING (COMPLIANCE AND EFFECTIVENESS)

Monitoring the grazing lease (see table 2E) serves two general purposes: determining whether the lessee is in compliance with the lease terms and conditions (compliance monitoring) and determining whether the goals and objectives of the grazing program are being met (effectiveness monitoring). If compliance monitoring determines that the terms and conditions are not being followed, action might be warranted to correct the management of the lessee. If effectiveness monitoring determines that the grazing program is not meeting its goals and objectives, action might be warranted to revise the grazing management plan, lease terms and conditions, or other management activities if it is really an issue that can be better addressed with other management tools. If not justified by unexpected circumstances, repeated failure to meet performance standards should be cause for termination of the lease.

Ideally, the terms and conditions of the lease include provisions that will effectively

achieve the goals and objectives of land manager or owner. For instance, soil conservation may be a resource goal, so there may be an RDM standard in the grazing lease or grazing management plan (Salls et al. 2018; Heady 1966). Monitoring RDM in the fall will determine whether the lessee is compliant with the RDM standard, and monitoring to detect excessive rilling will determine whether the RDM standard (if it is being met) is effective at achieving the soil conservation goal. Similar monitoring programs may be conducted for invasive plants (compliance monitoring might be to verify whether the lessee is using certified weed-free supplemental feed, and effectiveness monitoring would be surveying for new invasive plant infestations). Other monitoring programs may be conducted for conservation of rare plant populations or management of other habitat parameters.

CONCLUSIONS

A good livestock lease will include the necessary elements to be a legal contract, providing legal protections and clarity for both lessor and lessee and enabling each to cooperatively achieve their goals and objectives. This guide is meant to provide background information for landowners and land managers, as well as livestock producers, who might be interested in entering into a grazing lease to help achieve management objectives.

GLOSSARY

Animal unit month (AUM): The amount of forage required by a mature cow with a nursing calf for 1 month. AUM can serve as the basis for describing pasture carrying capacity or grazing lease rates (see table 1). Estimated to be 790 pounds of air-dry forage per month (NRCS 2003).

Ecosystem services: Goods and services (such as food and fiber production, recreation opportunities, water infiltration, and carbon sequestration) produced by natural habitats.

Grazing Management Plan: A document prepared by a Certified Rangeland Manager (CRM) (licensed by the California Board of Forestry and Fire Protection) that identifies goals and objectives, current conditions and resources, grazing management that will help to achieve the goals and objectives given the current conditions and resources, and a monitoring plan with adaptive management options to be informed by monitoring results to help achieve the goals and objectives.

Residual dry matter (RDM): The amount of dry forage remaining on the range before the onset of fall germinating rains. RDM is typically expressed in pounds per acre (or kilograms per hectare) and measured in September in California. RDM standards can be used to protect soil from the impact of germinating rains and can also affect vegetation composition and forage productivity in the following growing season. Remote sensing methods paired with field verification have proved to be cost effective methods for determining RDM standard compliance when working with large grazing units.

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Staff Report

File #: 25-3366 **Agenda Date:** 8/21/2025 **Agenda #:** 6.

Advisory Board: Integrated Pest Management Advisory Committee-Decision-Making Subcommittee
Subject: 6. REVIEW commensal rodent and gopher management decision documents and DETERMINE whether there is interest in revising the documents and ADVISE staff on the preferred process for making revisions.
Presenter: Wade Finlinson
Contact: 925.655.3214

Information:
The bylaws of the Integrated Pest Management Advisory Committee (IPMAC) list several purposes of the Committee. Those include:

- Making policy recommendations upon assessment of current pest issues and evaluation of possible IPM solutions.
- Providing a forum for communication and information exchange among members in an effort to identify, encourage, and stimulate the use of best or promising pest management practices.
- Promoting transparency in pest management decision-making by County Departments.

Referral History and Update:
The IPM Decision-Making Subcommittee is currently the only standing subcommittee of IPMAC. In pursuit of the above purposes, the Subcommittee creates and revises documentation to transparently depict rationale for pest management decisions within County operations. These documents often include recommendations for operational refinement.

During the April 17, 2025 meeting of this Subcommittee, this Subcommittee discussed a tentative work plan that would initiate a review of commensal rodent and gopher decision documents. The last revision of the commensal rodent and gopher management decision documents was completed in 2016. The item was placed on the July 17th agenda, but was not considered due to lack of time.

Recommendation(s)/Next Step(s):
Staff recommends reviewing the attached documents and advising on potential revisions.

Contra Costa County
DECISION DOCUMENTATION for COMMENSAL RODENT MANAGEMENT

Date: 5/29/2013, revised 6/2/2016

Department: Facilities Division

Location: County wide

Situation: Rat and mouse management to protect food, infrastructure and human health & safety in and around County buildings

What are the management goals for the sites?	Prevent rats and mice from entering County buildings; prevent rodent complaints in County buildings, remove rodents from buildings if they get in; and comply with Health Department regulations.	
Who has jurisdiction over the areas in question?	The County has jurisdiction over the facilities in question.	
How are the sites monitored and how frequently?	All County buildings that receive regular services under the structural pest management contract are monitored by technicians from Pestec, the County's structural IPM contractor. Some locations within the County elect to have "per-call" services, only requesting services when County staff determine it necessary. It is also the responsibility of all County staff and building occupants to continually monitor and report signs of rodent activity to the Facilities Division. Monitoring is done by visual inspection. Monitoring frequency depends on the type of building and its use and can range from twice a week to monthly. As a monitoring aid, Pestec has placed rodent bait stations around various County buildings. Detex Blox® (non-toxic feeding blocks) are placed inside the bait stations along with a T-Rex® snap trap that that is not set. Pestec technicians regularly inspect the feeding blocks for evidence of rodent gnawing. When evidence of feeding is detected, the snap traps are set. (More on trapping below under physical controls.) Buildings with kitchens or food handling facilities are monitored more frequently and with closer scrutiny.	
The problem species have been identified as the following:	**Roof rat** (*Rattus rattus*); **Norway Rat** (*Rattus norvegicus*); **house mouse** (*Mus musculus*) Rats and mice can damage structures by gnawing and can cause electrical fires by chewing off insulation around electrical wires. These rodents can chew on, nest in, and excrete wastes in sensitive electronic devices. They eat human and animal food and contaminate surfaces and food with urine and feces. They also carry a number of human diseases, and house mouse urine contains a protein that can trigger severe asthma or allergic reactions in susceptible people. These rodents are carriers of ectoparasites such as fleas and mites that can bite people, and they are implicated in the transmission of 55 different human pathogens.	
What is the tolerance level for these species?	**Tolerance level**: The tolerance level outside of buildings for rats and mice varies. There is a zero tolerance for Norway Rat burrows within 500 ft from an occupied structure on County property. There is also a zero tolerance for the sighting of a roof rat during the day on County property. Mouse population tolerances outdoors are undetermined. The tolerance level for rodents inside buildings is zero. Any feeding activity on Detex Blox outside and any sightings or evidence of rodents inside County buildings justifies treatment (education, sanitation, clutter control, pest proofing, vegetation management, trapping).	
Are these sensitive sites?	Are any of the sites part of any of the court-ordered injunctions regarding threatened and endangered species? (see: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay) The County does not normally use rodenticides for the control of rats or mice, but might use a rodenticide in the event of a public health emergency.	Possibly

	The injunctions exempt "The use of the Pesticides covered under Section 3 above [applicable rodenticides are brodifacoum, bromadiolone, bromethalin, cholecaliciferol, difenacoum, difethialone, and warfarin] for: "--the purpose of public health vector control when such a program is administered by public entities; or "--use by certified applicators for control of a vector pest when such control is necessary to respond to a federally or state declared public health emergency." Are there other sensitive species to be aware of? In urban areas, pets as well as birds of prey, and sometimes wild mammalian predators feed on rodents. Pets and other urban wildlife could feed directly on rodenticides if the rodenticides were not secured inside a tamper-resistant bait station.	
	Is there known or potential habitat for any endangered or threatened species at any of the sites? See also above.	Possibly
	Are any of the sites in or near an area where people walk or children play? County buildings in general are sensitive sites because people work in the buildings. Head Start facilities are especially sensitive because of the children who spend many hours of their day in the buildings. Buildings with kitchens or food handling facilities are also especially sensitive. Extra care must be taken at Head Start sites to make sure children cannot access snap traps. Inside offices, snap traps for mice are set in concealed or out-of-the way locations and occupants are informed of their location.	Yes
	Are any of the sites near a drinking water reservoir?	N/A
	Are any of the sites near a creek or flood control channel?	N/A
Which cultural controls were considered?	**Educating custodial staff and building occupants on proper sanitation and its critical role in rodent control** • Store food properly, especially at night. Proper food storage is in the refrigerator or cooler or in glass, metal or heavy plastic with a tight-fitting lid. • Limit areas for eating and storing food. Building occupants should be strongly discouraged from keeping food in their desks. • Keep eating and cooking areas clean. • In food handling and preparation areas, regularly steam clean appliances and hard-to-reach areas that may accumulate food debris. • Limit the disposal of food waste to designated garbage receptacles. • Remove all garbage from buildings at the end of the day, and store in receptacles that will prevent rodent access. • Outside, make sure all refuse goes into the proper receptacles. Do not allow any food wastes to accumulate outside of dumpsters or other garbage cans. • Keep garbage can and dumpster lids closed. • Regularly clean waste receptacles and dumpsters. **Preventing rodent access to structures** • Educate Facilities maintenance personnel about the importance of and reasons for rodent proofing. • Make general building repairs and seal large and small holes in structures, both inside and out. Mice can squeeze through a hole that a pencil can fit in, and rats can enlarge that size hole by gnawing until they can fit through also. • Seal vents with ¼" hardware cloth. • Seal gaps where pipes and wiring enter the structure.	

	• Weather strip doors and windows, and use door sweeps, metal kick plates, or raised metal door sills to prevent rodent entry. Openings around doors should be less than ¼". • Repair broken sewer pipes. • Install threaded caps on drains, and make sure that the traps in little used drains are kept filled with water. • Make sure air conditioning units are well-sealed, especially those on the roof. • Trim tree and large shrub branches 3 to 6 feet from buildings to prevent rodents from using the branches to access upper levels of structures. **Limiting availability of shelter/harborage for rodents** • Trim bushes and ground covers at least 2 feet from the structure to decrease cover for rodent runways, to prevent hidden access to buildings, and to make inspections easier. • Remove ivy and other vines from outside walls. • Eliminate dense plantings, especially next to structures. In landscaping, break up dense plantings with pathways, stretches of lawn, or very low ground cover to decrease cover for rodent runways. • Eliminate plantings of Algerian ivy (*Hedera canariensis*) and date palms because rats can live in and feed on these plants. If it isn't possible to immediately eliminate these plantings, work toward that goal. In the meantime, shear ivy very close to the ground. • Remove rock and wood piles and construction debris. • Reduce clutter and debris that can provide hiding places for rodents. Items such as paper, cloth, carpeting, and insulation are ideal nesting materials for rodents and should be stored in rodent-proof containers if mice or rats are making use of them. • Seal holes in structures that allow rodents access to shelter or harborage in the buildings. • Keep weedy grasses trimmed low and/or eliminate them to reduce harborage and food from seeds. **CONCLUSIONS: All of these tactics are very important in reducing the number of rodents in and around structures. All of these tactics are used where appropriate in the County.**
Which physical controls were considered?	Trapping requires more time, effort, and skill than other control methods, but has several advantages: you can see your success, rodents do not die in walls or other inaccessible places and cause odor and fly problems, and no rodenticides are necessary. **Live Trapping** **Multiple catch live traps** for mice can be useful in certain situations and can save labor in setting individual traps. They do not need to be baited and can be used at any time of the year. It is important to use a sufficient number of traps to resolve the problem in a timely manner. The mice must be humanely euthanized and should not be released alive outside the building because they will return to cause more problems. **Glue boards** can successfully catch mice but are not as effective for rats. Rats may pull themselves free of the glue, and if the board is not anchored, the rat may drag it away with only a tail or a foot caught. Glue boards are generally considered inhumane because rodents caught in the glue usually die slowly and with much struggle. For rats, snap traps are much easier to use and more effective than live traps. Rats are much larger than mice and present more problems for humane euthanization **Kill trapping** **Snap traps** are effective for both rats and mice and can be used both indoors and out at any time of the year. In general, they should be baited with something that is attractive to the target animal. Indoors, traps must be placed where they will not attract attention and where children and adults will not accidentally encounter them. Trap placement is crucial for success and in general, it is important to use more, rather than fewer traps. Traps set inside a building should be inspected within one week to remove any rodents that were caught. Outdoors, when feeding is detected on a Detex Blox inside a rodent bait station, the T-Rex® trap inside the station is baited and set. Currently, Pestec feels that T-Rex traps are the best choice for use inside a bait station. The station must be large enough to accommodate the trap. Pestec uses Protecta Sidewinder® Bait Stations, but other brands that will easily accommodate the trap with its jaws open will work. The bait stations are inspected within a week to remove trapped rodents. At this point, the bait is refreshed and the traps are reset. When no more rodents are being trapped, the traps are deactivated and the technician

	goes back to monitoring the station for feeding activity. **Electronic traps** are also available for rats and mice. These electrocute the rodent and need batteries to operate. They are also 7 to 8 times more expensive than a T-Rex trap. Pestec is testing the various brands for use in the County. **CONCLUSIONS: Trapping is very effective and is the only method of direct control used in the County, barring a public health emergency. Pestec has experimented with 2 brands of multiple catch traps (Victor® Tin Cat and Kness® Ketch-All) for mice along with various set ups for the traps. They have not found them as effective as snap traps, but continue to test multiple catch traps.**
Which biological controls were considered?	**Biological controls available:** There are a number of animals that prey on rats and mice, including cats and owls Predators can prune rat and mouse populations, but they cannot provide the degree of control necessary in the specific locations. Cats and dogs are often found living in close association with an infestation of rats or mice. **CONCLUSIONS**: **There are no biological controls that can effectively manage the County's rat and mouse populations in specific areas; however, natural predators can aid the County's efforts considerably. Owls living on the roof of the County Administration Building at 651 Pine in Martinez have left a huge number of rodent bones on the roof.**
Which chemical controls were considered?	The County does not use rodenticides to control rats and mice in and around buildings. Repellents will be considered for rat and mouse control when trapping and exclusion are insufficient. Repellents may include DeTour, an EPA exempt pesticide, or other repellents that are tested and found to be more efficacious and still within Pestec's IPM certification guidelines. **CONCLUSIONS:** **In the event of a public health emergency, the County would use all available means to control rats and/or mice, including rodenticides, if necessary.** **A first generation anticoagulant, such as warfarin, would be chosen. Warfarin is readily accepted by both rats and mice, it effectively kills these rodents, and it has a wide margin of safety because it requires multiple daily sequential feedings for toxicosis, and it has a readily available and easily administered antidote (Vitamin K). First generation anticoagulants also pose less of a secondary poisoning risk.** **If rodenticides must be used, they will be used according to the Greenshield IPM Certification Standards as follows:** i.) used only after reasonable measures are taken to correct conducive conditions including preventing access to water, food or garbage; removing clutter; sealing cracks or holes in foundations, sidewalks; removing tall weeds; and trimming shrubs to expose ground and discourage rat burrowing; and ii.) in bait-block form and placed in a locked, distinctively marked, tamper-resistant container designed specifically for holding baits and constructed of metal or heavy duty plastic and securely attached to the ground, fences, floors, walls or weighted bases, etc. such that the container cannot be easily moved/removed; and iii.) baits are secured (e.g., on a rod) in the baffle-protected feeding chamber of the bait container and not in the station's runway; and iv.) in loose pellet formulation or loose meal formulation (i.e., not within packets) placed deep into burrows (i.e., at least two feet into the burrow from the burrow's main entrance) to reduce potential for rejection or access by non-target animals. Neither bait blocks nor baits still enclosed within packets are to be used for direct burrow baiting.
Which application methods are available for this rodenticide?	Applications around buildings must be made in tamper-resistant bait stations situated along walls or other external parts of buildings (e.g., doorways, ramps and loading docks) where rats or mice might seek to gain entrance. Indoors, rodenticides must be used in tamper-resistant bait stations. **CONCLUSIONS: Rodenticide would first be deployed in tamper-resistant bait stations that would be anchored to the substrate.** **Tamper-resistant bait stations are of durable fabrication and meet the following criteria:** **1. resistant to weather** **2. strong enough to prohibit entry by large non-target species**

	3. equipped with a locking lid and/or secured rebaiting hatches **4. equipped with entrances that readily allow target animals access to baits while denying access to larger non-target species** **5. capable of being anchored easily and securely to resist efforts to move the container or to displace its contents** **6. equipped with an internal structure for securely containing baits** **7. made in such a way as not to be an attractive nuisance** **8. capable of displaying proper precautionary statements in a prominent location.** **In an emergency, if control of burrowing rats is not achieved with mechanical means or repellents, then burrow baiting to the Green Shield IPM Certification specifications (see above) will be employed.**
What factors were considered in choosing the pesticide application method?	Safety to the applicator, the environment, and nontarget species; endangered species considerations, the effectiveness of the method, and the cost to the Division.
What weather concerns must be checked prior to application?	Since the rodenticide would be protected inside a bait station, weather would not be a concern.

Contra Costa County
DECISION DOCUMENTATION for GOPHER MANAGEMENT in LANDSCAPES

Date: 5/12/16

Department: Public Works Grounds Division and Special Districts

Location: Countywide

Situation: Gophers in parks, frontage landscaping, and County landscaping

What is the management goal for the sites?	Gopher management in the County does not seek to eradicate the animals. The management goals are to prevent gopher damage to landscaping and to building foundations or other infrastructure such as irrigation pipes and tubing, and prevent tripping hazards where children, adults, and pets play. Historically, there was such a large population of gophers in the area above Reliez Valley Rd. in the Hidden Pond Landscaping Zone that gophers were being controlled to minimize destabilization of the slope to prevent landslides.
Who has jurisdiction over the areas in question?	The County has jurisdiction over the sites; however, in Special District frontage or other landscaping, the County does not control the allocation of funds for landscape maintenance, including pest management. Note that Special District landscaping zones formed before 1996 do not have a built-in CPI escalator, which makes it difficult to increase the funding available for landscape maintenance. The 3 zones currently monitored for gophers are Livorna Park, Hidden Pond Landscaping Zone, and Driftwood Landscaping Zone. Hidden Pond was formed in 1990, and Driftwood was formed in 1993.
How often are the sites monitored?	This varies from site to site. In the course of their other work, Grounds Division staff survey for evidence of gophers. The Division also responds to complaints about gophers from County staff. The vertebrate pest management contractor for Special Districts regularly surveys for gophers in Livorna Park, Hidden Pond Landscaping Zone, and Driftwood Landscaping Zone and responds to complaints relayed through Special Districts staff.
The problem species has been identified as the following:	Pocket gopher, *Thomomys* sp. From the UC IPM Pest Notes on pocket gophers (http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html): "Pocket gophers are herbivorous and feed on a wide variety of vegetation but generally prefer herbaceous plants, shrubs, and trees. Gophers use their sense of smell to locate food. Most commonly they feed on roots and fleshy portions of plants they encounter while digging. However, they sometimes feed aboveground, venturing only a body length or so from their tunnel opening. Burrow openings used in this manner are called 'feed holes.' You can identify them by the absence of a dirt mound and by a circular band of clipped vegetation around the hole. Gophers also will pull entire plants into their tunnel from below. In snow-covered regions, gophers can feed on bark several feet up a tree by burrowing through the snow. "…A single gopher moving down a garden row can inflict considerable damage in a very short time. Gophers also gnaw and damage plastic water lines and lawn sprinkler systems. Their tunnels can divert and carry off irrigation water, which leads to soil erosion. Mounds on lawns interfere with mowing equipment and ruin the aesthetics of well-kept turfgrass." Gophers sometimes girdle trees and shrubs and can kill trees with trunks several inches in diameter. Gophers also mix, aerate, and loosen soil, all of which can promote plant growth.
What is the tolerance level for this species?	One gopher burrowing in ornamental landscaping or a lawn will trigger management actions. Gophers in adjacent fields or in areas that are more wild are not managed except where gophers become numerous enough to destabilize the hillsides. Currently this applies to Hidden Pond Landscaping Zone only.

Are these sensitive sites?		
	Are any areas part of the court-ordered injunctions? (see: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay)	No for the 2 sites where rodenticide was used in the past: Hidden Pond and Driftwood.
	Are any of the sites known or potential habitats for any endangered or threatened species?	No
	Are any of the sites on or near an area where people walk or children play? Care must be taken when using gopher traps, so that neither pets nor children are likely to encounter them.	Yes
	Are any of the sites near a drinking water reservoir?	Not applicable
	Are any of the sites near a creek or flood control channel?	Not applicable
	Are any of the sites near crops?	No
	Are any of the sites near desirable trees or landscaping?	Yes
	Are any of the sites on soil that is highly permeable, sandy, or gravelly?	Not applicable
	At any of the sites, is the ground water near the surface?	Not applicable
	Are there any well heads near the sites?	Not applicable
What factors are taken into account when determining the management technique(s) for gophers?	The proximity to foot traffic—currently traps are not used where children or other passersby might find and try to remove or tamper with the trap. Other considerations are the following: safety to the gopher manager, the environment, and non target species; endangered species considerations; the effectiveness of the method; and the cost to the Department or the Special District.	
What factors contribute the cost of gopher management?	1. The number of gophers at the site. 2. The number of gopher mounds at the site—each must be tamped down to determine which tunnels are active. 3. The size of the site—if a large site must be surveyed on foot, it will take longer. 4. The distance of the site from the corporation yard. 5. The skill and experience of the pest manager—someone with little experience and skill will take longer to find and trap gophers or kill them with CO_2. 6. The frequency of re-invasion—sites near open fields, vacant lots, construction sites, and wildlands will experience repeated gopher invasions.	
Are special permits required to trap or otherwise kill gophers?	No special permits are required. Gophers are considered nongame animals by the California Department of Fish and Wildlife, which means that if a property owner finds gophers that are injuring garden or landscape plants or other property, the property owner can control the gophers at any time in any manner that is legal.	
Which cultural controls were considered?	**Flooding:** This method is not particularly effective and would use large amounts of precious water. Most gophers survive flooding in their burrows. Some may be forced to the surface, but the pest manager would have to use something like a shovel to kill those exiting burrows. **Planting buffers or repellent plants:** A 50 ft. buffer planted in a grain, such as wheat, is mentioned in the literature, but this is not practical for the County. There is no evidence for the efficacy of planting so-called gopher repellent plants such as castor bean.	

	Conclusion: There are no practical or effective cultural controls for gophers in County landscaping.
Which physical controls were considered?	**Trapping**: Trapping is a very effective management method. There is skill and art to trapping, especially in finding the proper burrow in which to place traps; therefore, the more experienced the trapper, the more successful they are. Each management situation is unique and must be assessed at the time of inspection to determine a plan of action. There are a number of styles of gopher traps. The Grounds Division uses the Victor Black Box Trap. The Special District contractor uses the Gophinator trap, and the GopherHawk trap. • The gopher manager surveys the area to determine which gopher mounds look the freshest and flags those mounds. The remaining mounds are flattened. • The following day, the manager returns to determine which mounds are actually the newest. Brand new mounds, or mounds that had been flattened and were then pushed up again, indicate the gopher is working in those areas. Otherwise the flagged mounds are still the most recent. • Working near the newest mounds, the manager uses a probe (a long pole) to find the main gopher tunnel. • A small area above the main tunnel is excavated so the traps can be inserted. Two traps are set, one in each direction back to back, so that a gopher travelling along the tunnel in either direction will encounter the business end of the trap. • The hole is covered with a board. Recommendations vary on whether or not to cover the hole, and some sources indicate that it doesn't matter, but in the County, the hole should be covered to help prevent the public from investigating the trap. The spot is marked with a small flag. In an April 2013 paper in *Crop Protection*, Baldwin, et al. found that the Gophinator trap was more effective than the Macabee trap [another similar body gripping trap], probably because it was able to capture larger gophers. They also found that covering traps in late spring to early summer increased catches, but not during autumn. They recommended that if efficacy is paramount, traps should be covered from late spring to early summer, but if time is a constraining factor, traps can be left uncovered. • Sometimes gophers are trapped immediately while the manager is still working at the site. If not, the manager returns within 24 hours to check the traps. **Explosive Devices**: The Rodenator injects a combination of 3% propane and 97% oxygen into a burrow and ignites these gases. The resulting explosion collapses the tunnel and creates a shockwave that kills gophers in the burrow. Around 2013, the Grounds Division conducted a trial of the Rodenator outside the Public Works Administration building on Glacier Drive in Martinez. Gophers were burrowing close to the building, and it was feared that they might undermine the foundation. The device worked well and no gophers have been seen in that area since. There are, however, some problems with this device. All the windows on the treatment side of the building had to be protected with sheets of plywood, and the explosions rattled the windows and the occupants of the building. The reports from the explosions, which sound like gunshots, precipitated calls to the police, even though the surrounding neighbors had been notified. The Division has not pursued this strategy because of this last issue. There is also a fire risk with this method. **Exclusion with wire mesh:** Three-foot high ½" wire mesh buried 2 feet below ground and encircling a plant can exclude gophers temporarily. These wire cages are only effective in protecting a small area and are very expensive to make and install. **Conclusion: Trapping is the most effective and practical physical control for gophers in County landscaping. All gopher problems are currently managed with trapping.**
Which biological controls were considered?	Great blue herons, coyotes, domestic dogs and cats, foxes, and bobcats capture gophers at their burrow entrances; badgers, long-tailed weasels, skunks, rattlesnakes, and gopher snakes corner gophers in their burrows. Owls and hawks capture gophers above ground. Predators can prune a population, but none of these predators can control gophers to the extent that is necessary in County landscaping. Owl boxes could attract more owls to certain areas of the County. More owls could mean somewhat fewer gophers in open fields. **Conclusion: Biological controls alone for gophers have not been shown to reliably reduce populations to the level that will prevent damage to plants and infrastructure.**

Which chemical controls were considered? For more information on pesticides listed here visit the National Pesticide Information Center (NPIC). This a joint project of Oregon State University and the US EPA. http://npic.orst.edu/ You can communicate with an actual person at **1.800.858.7378** or **npic@ace.orst.edu** They are open from 8:00AM to 12:00PM Pacific Time, Mon-Fri	**The risk to predatory animals must be considered before any rodenticides are used for gopher management.** **Fumigants** Extension and university literature recommend against using fumigants for gophers because the animals can quickly backfill a tunnel when they perceive a threat, which prevents the gas from reaching them. Injecting gas far enough into their extensive burrow system is difficult, and since their tunnels are close to the surface, gas can leak out and never reach a concentration high enough to kill. CO_2 Injection • The Grounds Division has purchased a device called the Eliminator which injects carbon dioxide into the burrow system. So far the gopher manager has had good luck with this device. Perhaps this is more effective since the CO_2 initially sinks to the floor of the burrow. • This device can be used where foot traffic prohibits the use of traps. • The same preliminary procedures are employed for this device as for trapping (see above). • Before deploying the device in the burrow, any openings should be closed and remaining mounds should be flattened to help keep the gas inside the burrow. • When the trigger on the device is pulled, there should be no hissing sounds. • The area should be monitored the day after the treatment to determine the degree of success. *A note on "signal words," below: these designations from the USEPA pertain to the acute toxicity of a pesticide.* Aluminum Phosphide Signal Word: DANGER • Fumigation with aluminum phosphide is effective for gophers, although it is a restricted use material that requires a permit from the County Department of Agriculture. Aluminum Phosphide is not used in the County for gophers. **Baiting** Diphacinone (005%) Multiple Dose Bait Blocks (Eaton's Answer®) Signal Word: CAUTION. Baiting is no longer used for gophers in Contra Costa County. **Conclusion: CO_2 injection has worked well for the Grounds Division, but lack of staff has curtailed its use. For large areas with many ground squirrels, it could be used again.** **Baiting is not being used.**
Recommendations from the IPM Advisory Committee	**On-going monitoring should be used to adjust control activities to a level appropriate to the population of gophers. Trapping and CO_2 injection are the preferred control methods when sufficient funding is available.** **Consider expanding trapping into areas where children or other passersby have access after investigating techniques used in school IPM programs or other programs where trapping is conducted in sensitive sites.**
References	Baldwin, R.A., D.B. Marcum, S.B. Orloff, S.J. Vasquez, C.A. Wilen, and R.. Engeman (2013). The influence of trap type and cover status on capture rates of pocket gophers in California, *Crop Protection*, 46: 7-12.

Contra Costa County
DECISION DOCUMENTATION for RAT MANAGEMENT AT LIVORNA PARK

Date: 8/4/2016

Department: Special Districts

Location: Livorna Park in Alamo and potentially other sites in the future

Situation: Rat management to protect human health & safety, ornamental plantings, and structures in Livorna Park

What are the management goals for the sites?	Livorna Park is the only park managed by County Special Districts where rats have been a problem over the past few years. They were damaging young hibiscus bushes at the edge of the park in the bed above the retaining wall by chewing on the bark. Currently rats are not an issue at Livorna or in any other Special District landscaping or park locations. However, it is possible that in the future Livorna Park or another area may have rat problems. The management goals would still be the following: • Prevent rats from killing or damaging plants by gnawing on the bark. • Protect public health. • Protect park structures from damage.	
Who has jurisdiction over the areas in question?	The County has jurisdiction over the facilities in question; however, the County does not control the source and amount of funding for pest management.	
How are the sites monitored and how frequently?	Various. Livorna Park is monitored weekly by landscape maintenance personnel from the County Grounds Division. The site is also monitored monthly by the vertebrate pest management contractor for Special Districts. Monitoring is done by visual inspection, looking for evidence of chewing on shrubs, evidence of runs, droppings.	
The problem species have been identified as the following:	**Roof rat** (*Rattus rattus*) Roof rats are omnivorous, but tend to more vegetarian preferences. Typical food is fresh fruit, plant material, nuts and seeds, vegetables and tree bark. Rats can damage or kill shrubs and young trees by gnawing on the bark or girdling the plant. Rats damage structures by gnawing and can cause electrical fires by chewing off insulation around electrical wires. They contaminate surfaces and food with urine and feces. These rodents are carriers of ectoparasites such as fleas and mites that can bite people, and they are implicated in the transmission of 55 different human pathogens.	
What is the tolerance level for these species?	**Tolerance level**: Any evidence of roof rats, such as gnawing on bark, evidence of runs, droppings, or gnawing on structures or wires, triggers a more thorough investigation. Treatment actions would begin if rats were seriously damaging shrubs or if there were evidence of on-going damage to infrastructure. Treatment ceases when new damage is no longer evident.	
Are these sensitive sites?	Is the site part of any of the court-ordered injunctions regarding threatened and endangered species? (see: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay) Are there other sensitive species to be aware of? In urban areas, pets as well as birds of prey, and sometimes wild mammalian predators feed on rodents. Pets and other urban wildlife could feed directly on rodenticides if the bait were not secured inside a tamper-resistant bait station.	Livorna Park is not part of any injunction, but if problems arose at other sites, this question would be revisited.
	Is there known or potential habitat for any endangered or threatened species at any of the sites?	No for Livorna Park, but for other sites, this question would be revisited.
	Are any of the sites in or near an area where people walk or children play?	Yes
	Are any of the sites near a drinking water reservoir?	N/A

	Are any of the sites near a creek or flood control channel?	N/A
Which cultural controls were considered?	**Limiting availability of shelter/harborage for rodents** • Trim bushes and ground covers at least 2 feet away from any structure to decrease cover for rodent runways, to prevent hidden access to buildings, and to make inspections easier. • Prune shrubs and hedges up from the ground at least 12 inches so the ground beneath is open and visible. Remove weeds under shrubs. • Thin bushes until daylight can be seen through them. Keep all plantings airy to eliminate harborage. • Keep tree branches pruned at least 6 feet away from any structures. • Do not plant vines. • Do not plant dense ground covers or hedges. • Do not plant ivy and date palms because rats can live in and feed on these plants. • Remove rock and wood piles and construction debris. • Seal holes in structures that allow rodents access to shelter or harborage in the buildings. • Keep weedy grasses trimmed low and/or eliminate them to reduce harborage and food from seeds. **Limiting availability of food for rodents** • Use garbage cans that rats cannot access. • Remove garbage daily, ideally before nightfall, since rodents will be feeding at night. **CONCLUSIONS: All of these tactics are very important in reducing the number of rodents in and around structures. All of these tactics are used where appropriate in the County.**	
Which physical controls were considered?	Trapping requires more time, effort, and skill than other control methods, but has several advantages: you can see your success, no rodenticides are necessary, and there is no risk of secondary poisoning. **Live Trapping**: Rats caught in live traps would have to be humanely euthanized and would require a contractor with that capability. Glue boards are useful in certain situations, but glue boards are generally considered inhumane since rodents caught in the glue usually die slowly and with much struggle. Outdoors, glue boards would quickly be rendered ineffective by dirt and debris. **Kill trapping**: Snap traps are effective for roof rats and can be used both indoors and out at any time of the year. In general, they should be baited with something that is attractive to the roof rats. Traps must be placed where they will not attract attention and where children and adults will not accidentally encounter them. Trap placement is crucial for success and in general, it is important to use more, rather than fewer traps. Outdoors, snap traps can be used inside of rodent bait stations. This makes the trap inaccessible and hides catches from public view. Pestec IPM Provider, the current County structural IPM contractor uses Protecta Sidewinder® Bait Stations, but other brands that will easily accommodate the trap with its jaws open will work. Pestec places an unset snap trap (T-Rex®) and a non-toxic feeding block (Detex Blox®) inside the bait station. The purpose of the feeding block is to entice rats inside and to accustom them to entering the bait station safely. When monitoring shows that rats are feeding on the Detex Blox, the snap trap inside the station is baited and set. Pestec considers T-Rex traps to be the best choice for using inside a bait station. The bait stations should be inspected within a week to remove trapped rodents. At this point, the bait is refreshed and the traps are reset. When no more rodents are being trapped, the traps are deactivated and the technician returns to monitoring the station for feeding activity. Electronic traps are also available for rats and mice. These electrocute the rodent and need batteries to operate. They are also 7 to 8 times more expensive than a T-Rex trap, and must be monitored for battery replacement. **CONCLUSIONS: Trapping is very effective and is the only method of direct control used around County buildings, barring a public health emergency. In Livorna Park, both trapping and rodenticides have been used in the past; however, trapping was not successful, and no rats were caught. Nevertheless, trapping should always be considered first.**	
Which biological controls were considered?	**Biological controls available:** There are a number of animals that prey on rats and mice, including cats and owls. Predators can prune rat populations, but they cannot provide the degree of control necessary in a specific location. Cats and dogs are often found living in close association with an infestation of rats. **CONCLUSIONS**: **There are no biological controls that alone could reliably reduce the rat population below the damage threshold.** **The County, however, has erected an owl box in Livorna Park because natural predators can aid the County's efforts considerably. The County is not currently using rodenticide in the park but could not control whether residents around the park use rodenticides. Any owls nesting in the box at Livorna**	

	Park could be at risk for poisoning. To reduce the risk, the County will place posters in the park explaining the purpose of the owl box, and the Eagle Scout who took on this project will prepare information about owl boxes and alternative rodent management that will be reviewed by the IPM Coordinator and then disseminated to the neighbors in hopes of curtailing the use of rodenticides. Supervisor Andersen's office will give a presentation at the Alamo Municipal Advisory Council's next meeting to explain the project and urge people to consider managing rodents around their homes with methods other than rodenticides. An article about the project will also be in the Supervisor's next newsletter.
Which chemical controls were considered?	**Since an owl box has been installed at Livorna Park, this biological control project must be considered before any rodenticides are used in the Park.** *Note on "signal words": these designations from the USEPA pertain to the acute toxicity of a pesticide.* Diphacinone (005%) Multiple Dose Bait Blocks (Eaton's Bait Blocks®) Signal Word: CAUTION. **If rodenticides must be used, they will be used according to the Greenshield IPM Certification Standards as follows:** i) used only after reasonable measures are taken to correct conducive conditions including preventing access to water, food or garbage; removing clutter; sealing cracks or holes in foundations, sidewalks; removing tall weeds; and trimming shrubs to expose the ground and discourage rat burrowing; and ii) in bait-block form and placed in a locked, distinctively marked, tamper-resistant container designed specifically for holding baits and constructed of metal or heavy duty plastic and securely attached to the ground, fences, floors, walls or weighted bases, etc. such that the container cannot be easily moved/removed; and iii) baits are secured (e.g., on a rod) in the baffle-protected feeding chamber of the bait container and not in the station's runway In addition, the bait stations must be labeled with the active ingredient in the bait and the name and address (or phone number) of the contractor. Diphacinone is a first generation anticoagulant that prevents blood from clotting and causes death by internal bleeding. First generation anticoagulants require multiple feedings over several days to a week to kill. This is different from second generation anticoagulants that are far more toxic and can kill within days of a single feeding if enough bait is ingested. Second generation anticoagulants pose a greater risk to animals that eat poisoned rodents. If the rodent continues to feed on the single-dose anticoagulant after it eats a toxic dose at the first meal, it may build up more than a lethal dose in its body before the clotting factors run out and the animal dies. Residues of second generation anticoagulants may remain in liver tissue for many weeks, so a predator that eats many poisoned rodents may build up a toxic dose over time. However, even the first generation anticoagulants may be poisonous to animals that eat poisoned rodents. The first generation materials break down much more rapidly in animal tissues and have a much reduced potential for secondary kill when compared to second generation materials. **CONCLUSIONS:** **The County is not currently using rodenticides for rat pest control in any Special District locations. Rodenticide would only be used if damage were serious and trapping could not be used or was not effective. In the event of a public health emergency, the County would use all available means to control rats and/or mice, including rodenticides if necessary.** **A first generation anticoagulant, such as diphacinone or warfarin, would be chosen. These rodenticides are readily accepted by rats, effectively kill these rodents, and have a wide margin of safety because they require multiple daily sequential feedings for toxicosis, and have a readily available and easily administered antidote (Vitamin K). First generation anticoagulants also pose less of a secondary poisoning risk.** **Treatment actions would begin only if rats were seriously damaging shrubs or if there were evidence of damage to infrastructure. Treatment ceases when new damage is no longer evident.**
Which application methods are available for this rodenticide?	Rodenticide applications must be made in tamper-resistant bait stations anchored to the substrate and situated along walls, other external parts of buildings, or along rodent runs.
What factors were considered in choosing the pesticide application method?	Safety to the applicator, the environment, and nontarget species; endangered species considerations, the effectiveness of the method, and the cost to the Special District.

What weather concerns must be checked prior to application?	Since the rodenticide would be protected inside a bait station, weather would not be a concern.
Recommendations from the IPM Advisory Committee	We recommend that the County investigate owl monitoring techniques and apply the most cost effective method in Livorna Park to track the success of the owl box. In an effort to build awareness and community buy-in, we recommend that information pertaining to pests in Livorna Park and their most appropriate treatment mechanisms be disseminated to surrounding residents. This is not necessarily the job of the contractor performing treatment. Appropriate outreach techniques and personnel should be investigated.

File #: 25-3367 **Agenda Date:** 8/21/2025 **Agenda #:** 7.

Advisory Board: Integrated Pest Management Advisory Committee-Decision-Making Subcommittee
Subject: 7. PLAN October 16, 2025 meeting
Presenter: Wade Finlinson
Contact: 925.655.3214

Information:

The bylaws of the Integrated Pest Management Advisory Committee (IPMAC) list several purposes of the Committee. Those include:

- Making policy recommendations upon assessment of current pest issues and evaluation of possible IPM solutions.
- Providing a forum for communication and information exchange among members in an effort to identify, encourage, and stimulate the use of best or promising pest management practices.
- Promoting transparency in pest management decision-making by County Departments.

Referral History and Update:

On March 20, 2025, IPMAC reviewed draft goals for each subcommittee. The 2025 priorities identified by the IPMAC Chair, Decision-Making Subcommittee Chair, and IPM Coordinator include the following:

(1) Revising the ground squirrel decision document.
(2) Reviewing commensal rodent and gopher documents.
(3) Review grazing documents.
(4) Considering alternate formats for the IPM Decision Tree to encourage greater adoption.

The tentative work plan discussed in the April meeting projected that the October meeting would focus on finalizing the commensal rodent and gopher decision documents, grazing document, and the IPM Decision Tree.

Recommendation(s)/Next Step(s):

Staff recommends continuing the review of the grazing tree and commensal rodent and gopher management documents, and postponing the review of the IPM Decision Tree.