

Contra Costa County Integrated Pest Management Advisory Committee

2017 Annual IPM Program Status Report

to the

Transportation, Water, and Infrastructure Committee of the Contra Costa Board of Supervisors

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Executive Summary

Work of the IPM Advisory Committee

This year, the IPM Advisory Committee explored how vegetation in rights-of way is managed in Contra Costa and in other counties, and developed a pest management awareness training for County in-home visitors.

In 2012, the Committee developed a form for documenting pest management decisions. Since then, the Departments have been using this form to systematically document management decisions for the pests they work with. This year, Special Districts and the Grounds Division finalized a document (begun last year) for the management of gophers in Special Districts and in County landscaping. Decision documents for vegetation management along roadsides and flood control channels are under review.

This summer, the Committee developed a presentation to educate in-home visitors in various programs throughout the County about the health and other risks of having pests in the home. The presentation includes accompanying resource materials. Training sessions began in November and will continue in the new year.

Pesticide Use Reduction by County Operations

Since FY 00-01, County operations have reduced their pesticide use by 75%. During the same time period, they have reduced their use of “Bad Actor” pesticides by 86%.

Departmental IPM Programs

The Department of Agriculture continues to concentrate its invasive weed program on contracted work for parkland and municipalities within the County.

A new species, the three-lined cockroach, has been invading County buildings. Although this cockroach was identified from the County in 2009, it was only last year that it began causing problems in County buildings. Unlike other cockroaches, this species does not feed on human food and garbage. This makes controlling the three-lined cockroach with commercial baits very difficult because the insect is not interested in the food attractants in the currently available cockroach baits. This year the County IPM contractor thoroughly sealed Building 500 at 255 Glacier. No three-lined cockroaches have been found in monitoring traps inside the building since. Pest exclusion works because this insect lives outside in the mulch and leaf litter around the building.

The owl box installed last year in Livorna Park in Alamo housed its first tenants over the summer. The box has been cleaned and is ready for new occupants. The Public Works Department worked with Boy Scouts to install two owl boxes in the Kubicek Basin in Walnut Creek. The County also worked with the Peregrine Team of Pine Canyon to erect two nest boxes for American kestrels in Kubicek Basin. This is a project of Native Bird Connections to increase kestrel habitat in the Mt. Diablo region.

The Roadside and Flood Control Maintenance Division continues to incorporate grazing into its vegetation management program. This fiscal year the Division used goats to abate weeds on approximately 257 acres, mostly on flood control facilities. A record-breaking rainy season seriously damaged some roads and blocked others with downed trees. This tied up crews with repairs and tree removal. Heavy rains spurred the growth of a bumper crop of weeds in the County, although the County was spared the devastating fires that raged to the north in the fall fed by the heavy weed growth.

History of the IPM Advisory Committee

From 2002 to 2009, an informal IPM Task Force met to coordinate implementation of the IPM Policy that was adopted by the Board of Supervisors in November 2002. The Integrated Pest Management (IPM) Advisory Committee, a formal body, was created by the Board of Supervisors in November 2009. This report is the eighth annual status report from the IPM Coordinator and the IPM Advisory Committee.

Background on the IPM Advisory Committee

Purpose of the IPM Advisory Committee

The purpose of the Committee is to:

1. Protect and enhance public health, County resources, and the environment
2. Minimize risks and maximize benefits to the general public, staff, and the environment as a result of pest control activities conducted by County staff and contractors
3. Promote a coordinated County-wide effort to implement IPM in the County in a manner that is consistent with the Board-adopted IPM Policy
4. Serve as a resource to help the Agriculture and Public Works Departments and the Board of Supervisors review and improve existing pest management programs and the processes for making pest management decisions
5. Make policy recommendations upon assessment of current pest issues and evaluation of possible IPM solutions
6. Provide 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

Members of the IPM Advisory Committee

Currently the Committee has a total of 13 seats consisting of voting and non-voting members. Because the Public and Environmental Health Advisory Board was abolished in 2016, that seat was replaced by one for the County's Sustainability Commission.

The 8 voting members include:

- One representative from Contra Costa Health Services
- One representative from the County Storm Water Program
- One representative from the County Sustainability Commission
- One representative from the County Fish and Wildlife Committee
- One representative from an environmental organization
- Three at-large members of the public

The 4 non-voting members include

- A representative from the Agriculture Department
- Two representative from the Public Works Department (Facilities Division and Maintenance Division)
- One representative from the County's pest management contractor

The Committee also has one public member alternate who only votes if one or more of the three at-large public members, the Sustainability representative, or the Fish and Wildlife representative is absent from a meeting.

IPM Advisory Committee Priorities for 2017

The IPM Advisory Committee focused on the following two IPM program features:

- A. IPM decision-making—documenting pest management decisions in County IPM programs
- B. Outreach and education—reviewing and/or creating educational pieces for the public and County staff

The Committee formed two subcommittees to work on these priorities, the Decision-Making subcommittee and the Outreach subcommittee.

2017 Accomplishments of the IPM Advisory Committee and the IPM Coordinator

Accomplishments of the IPM Committee

The IPM Advisory Committee (the Committee) held six regular meetings in 2017. The two subcommittees held a total of 13 meetings to address the above priorities. The IPM Coordinator serves as staff to the Committee and any subcommittees. According to the wishes of the Committee, the IPM Coordinator arranged for speakers for three of the six regular Committee meetings held during 2017. The following were the topics and presenters:

1. *Pest Prevention by Design: Authoritative guidelines for designing pests out of structures*, presented by Chris Geiger, San Francisco IPM Coordinator
2. Carbon monoxide as a treatment for burrowing rodents, presented by Dr. Roger Baldwin, UC Cooperative Extension; carbon dioxide as a treatment for burrowing rodents, presented by Dr. Bill Donohue, Sierra Laboratories
3. Controversy surrounding the herbicide glyphosate, presented by Dr. Brad Hansen, UC Cooperative Extension

The accomplishments of the IPM Committee and its subcommittees are as follows:

Priority A: IPM Decision-Making

Through the work of the Decision-Making subcommittee, the IPM Advisory Committee

1. Reviewed and provided suggestions for changes to the County's Landscape Standards under the section on pest management. All the suggestions were accepted by Public Works staff and have been incorporated into the document (<http://www.contracosta.ca.gov/2147/Landscape-Standards>)
2. Gained a better understanding of the complexities involved in pest management along the County's road and flood control rights-of-way
3. Gained a better understanding of the challenges and complexities involved in the funding mechanisms for road maintenance
4. Reviewed and provided suggestions for improvement to three decision-making documents (the two vegetation management documents are still under review):
 - a. Gopher management in landscapes (Grounds Division and Special Districts)
 - b. Vegetation management along County roadsides and road rights-of-way (Public Works Roadside and Flood Control Channel Vegetation Management Division)
 - c. Vegetation management along flood control channels (Public Works Roadside and Flood Control Channel Vegetation Management Division)
5. Continued gathering information on vegetation management on rights-of-way in neighboring Bay Area Counties

The detailed decision-making documents follow a form devised by the IPM Coordinator and previous members of the Decision-Making subcommittee. Decision-making documents are considered current as of the date on the document and may be updated in the future.

See Attachment A for the Decision-Making subcommittee's final report and the gopher decision document.

Priority B: Outreach and Education

This year, the subcommittee chose to work with the County's most vulnerable populations through outreach to in-home visitors with the goals of

1. Informing County staff of the public health risks of having pests in the home
2. Helping staff to recognize pest problems in their clients' homes
3. Making staff aware of the resources available for their clients

Through the work of the Outreach subcommittee, the IPM Advisory Committee

1. Gained understanding of the capabilities and constraints of in-home visitors

2. Created a 20 to 30 minute PowerPoint presentation with an accompanying script and resource materials for training County in-home visitors
3. Provided training for County staff

See Attachment B for the Outreach subcommittee's final report.

Accomplishments of the IPM Coordinator

In addition to staffing the IPM Advisory Committee and working on the two subcommittees, the IPM Coordinator worked on the issues listed below.

Bed Bugs

The common bed bug continues to be one of the most serious pests in the County, a pest that has provoked citizens to misuse pesticides to an alarming extent. Pesticides do not solve the problem, and in many cases make the problem worse. We increasingly see bed bugs affecting the citizens of Contra Costa who have the fewest resources to combat them.

Answering calls from citizens

The IPM Coordinator records each bed bug complaint, but it is unclear how many calls other staff in the County are receiving that are not forwarded to the IPM Coordinator. We also have no way of knowing how many calls city staff receive. In 2017, the IPM Coordinator investigated by telephone (sometimes with the help of the Bed Bug Task Force) 69 bed bug calls (compared to 75 last year) and provided assistance to the callers. The IPM Coordinator also met in person with a number of citizens to answer questions about bed bugs and provide information on prevention and management.

A substantial number of complaints continue to come from West County. There are increasing numbers of complaints from Pittsburg and Antioch, as well as Walnut Creek and Alamo, and it is generally acknowledged that there are numerous apartment complexes in Concord with severe infestations throughout the buildings. Some of these complexes have been infested for 7 or more years.

Educating County staff and the public about bed bugs

The IPM Coordinator

- Continued to organize and staff the County's Bed Bug Task Force—the Task Force meets every two months and advocates for increasing public awareness of bed bug problems and for developing sound bed bug management policy throughout the County
- Maintained the County's bed bug website and added more information specific to various audiences—from July 1, 2016 through June 30, 2017, there were 29,202 visits to the site from 20,255 unique visitors (County staff visits were excluded from this tally in order to obtain a closer approximation of the public use of the site).
- Provided bed bug awareness training for the following:
 - Contra Costa Interfaith Housing in Concord
 - Alive Program's Idaho apartment complex in El Cerrito (housing for HIV patients)
 - Summerfield Group Home in Antioch
 - CCC WIC staff in Concord
- With the assistance of Pestec, provided a bed bug awareness and prevention training for a group of managers at the Calli House Youth Shelter in Richmond.

Healthy Schools Act compliance for County Head Starts

In 2015, the IPM Coordinator worked with the County's Head Start program to come into compliance with California's Healthy Schools Act. The IPM Coordinator developed an IPM plan for the Head Start program which included identifying responsible parties for the provisions of the Act. The IPM Coordinator updates this plan each year. The IPM Coordinator provided staff with templates for pesticide application posting and for parent and staff notification of pesticide use.

The IPM Coordinator continues to oversee compliance with the Healthy Schools Act.

Advice and Outreach on IPM

The IPM Coordinator

- Gave the IPM Presentation for the Bay Friendly certification training held in February
- Worked with Alameda County Healthy Homes program and IPM experts from the state and around the Bay to create a PowerPoint presentation on IPM for multi unit property owners
- Participated in the County's Sustainability Exchange
- Joined the County's Sustainability Exchange Steering Committee
- Attended quarterly meetings of the Head Start Health and Nutrition Services Advisory Committee to report on bed bug and pest management issues
- Worked with the County Facilities Division on a quality assurance review of the County's structural IPM provider, Pestec
- Responded to a number of requests for pest management information from County staff and citizens
- Worked with Pestec on managing three-lined cockroaches in Building 500 at 255 Glacier in Martinez, and joined Pestec and the County Facilities Division in a meeting with Public Works staff about the cockroach problem
- Provided the annual IPM update to the County's Fish and Wildlife Committee
- Provided regular IPM program updates to the Board of Supervisors through their Transportation, Water and Infrastructure Committee

Conferences and Trainings Attended

- Santa Clara County Agriculture Department's Weed Symposium in San Jose
- EPA Webinar on bed bugs
- National Pesticide Information Center (Oregon State) webinar: Glyphosate and Communicating Risk
- National Pesticide Information Center (Oregon State) webinar: All about the Herbicide Properties Tool
- Contra Costa County Grounds Division annual pesticide safety and IPM training

2017 Department IPM Program Highlights and Challenges

General Information about the Departments

Each Department maintains an IPM Plan that covers their pest management goals, sites under management, decision making processes, key pests and best management practices, environmental stewardship, and training requirements.

In order to help new IPM Committee members understand the working of each department, the IPM Coordinator has developed Department Overviews that cover department responsibilities in general, and pest management responsibilities in particular; funding sources and budget; pests under management and the methods used to manage them; and department challenges.

Each of the County's pest management programs must keep records of pesticides used and submit a report monthly to the County's Agriculture Department for transmission to the state Department of Pesticide Regulation. Once a year, the IPM Coordinator collates and analyzes this information for the annual report.

Agriculture Department

IPM Program Highlights

- Subcommittee work

The Department participated as a member of the Decision-Making subcommittee.

- Invasive weed program

The Department concentrates their efforts on contracted work for parkland and municipalities within the County. The Department has successfully reduced artichoke thistle and purple starthistle to a level at which private landowners can now manage these weeds on their own. The Department continues to recommend that landowners who lease property to cattlemen include invasive weed control in their lease agreements to encourage ranchers to maintain a weed management program.

The Department's invasive weed treatments include hand removal, mechanical removal, and targeted treatment with low toxicity herbicides. With rare exception, pesticide treatment involved highly focused spot spraying using backpack sprayers.

- Artichoke thistle (*Cynara cardunculus*)

The Department surveys and treats properties under contract for East Bay Regional Park District and Contra Costa Water District. This year staff surveyed 36 sites totaling 27,205 acres and treated 23 net acres for artichoke thistle.

Artichoke thistle is a highly invasive, non-native perennial weed that displaces herbaceous plants and annual grasses, decreasing the value of agricultural land, open space, and wildlands. Horses and cattle will not consume this thistle, and at high densities, the formidable spines on the leaves and stems and on the bracts around the flowers make it impossible for animals or people to walk through stands of the weed.

In 1979 Contra Costa County was identified as one of the most heavily infested counties in the state. At that time, at least 100,000 acres of land were infested with artichoke thistle. In that year, the Department began their management program in cooperation with property owners by using ground rigs and helicopters to spray large swaths of land. The artichoke thistle infestation has been reduced so much that staff primarily spot treat individual plants using a backpack sprayer. Because seedlings form deep, fleshy taproots within the first year, mechanical or hand removal (digging out the plants) is not an option. Mowing and burning are neither practical nor effective.



Rangeland infested with artichoke thistle

- Japanese dodder (*Cuscuta japonica*)

In 2017, staff surveyed 30 historically infested sites and did not find any recurrence of this weed. This is a California Department of Agriculture “A rated” weed that the Department is obligated to treat. Since three years have passed since staff have found any dodder in the County, the Department is declaring it eradicated.

Japanese dodder is an aggressive parasitic plant that has the potential to severely alter the composition and function of riparian areas. It also affects ornamental plantings and agricultural crops. Japanese dodder is native to Southeast Asia and was first discovered in the county in 2005.



First Japanese dodder find in CCC, 2005



Kangaroo Thorn

- Kangaroo thorn (*Acacia paradoxa*)

The County has one site infested with kangaroo thorn. The removal of the existing infestation in 2005 involved 52 hours of staff time. At that time the infestation covered a little less than one net acre. In 2014, it took only 2 hours of staff time to accomplish the surveying and seedling removal, all of which was done by hand. Only small seedlings of less than one foot in height were found, and the infested area totaled less than one hundredth of an acre.

After a several year hiatus, annual surveys have resumed.

- Purple starthistle (*Centaurea calcitrapa*)

Under contract to the East Bay Regional Park District, the Department surveyed 17 sites covering 1845 acres and treated 23.9 net acres for purple starthistle.

This weed is a highly invasive non-native biennial that displaces annual grasses, desirable vegetation, and wildlife and decreases the production value of agricultural land. The plant also has allelopathic properties, which means it produces chemicals that inhibit the growth of other vegetation. Its large spines and high densities can form an impenetrable barrier to wildlife and livestock in open rangeland and to horses and hikers in parkland. Seed can remain viable in the soil for ten or more years.

Purple starthistle in Contra Costa County is not as widespread as artichoke thistle. However, being a prolific seed producer, it has the potential to become as large scale a problem as artichoke thistle. Early identification and eradication of isolated populations is key to preventing its establishment in uninfested agricultural lands.



Purple Starthistle

- Managing ground squirrels to protect critical infrastructure

The Department manages ground squirrels to protect critical infrastructure including levees, earthen dams, railroad beds, and roadways. The goal is to maintain a 100 linear foot buffer around the infrastructure to reduce ground squirrel damage to a tolerable level. Ground squirrel burrowing is the single biggest threat to California levees. Burrowing can compromise the earthen embankments and create pathways for water leakage that can undermine the structural integrity of levees, as well as earthen dams and railroad embankments. Burrowing and the resulting pathways for water erosion can also cause damage to, or sudden failure of, roadsides and other structures.

The Department has been taking steps to reduce the amount of rodenticide it uses for ground squirrel control in the County in order to mitigate harm to endangered and other non-target species. In 2013 the Department modified its broadcast baiting treatment procedure for safety and efficiency. Staff are applying bait more precisely and have reduced the number of bait applications in an area from three to two. Staff initially spread untreated rolled oats to draw out squirrels and make it easy to find areas of squirrel activity. Treatments are carried out by a team of two staff members so that one person can concentrate on driving while the other operates the bait spreader to apply bait only where ground squirrel activity is observed.

- Exotic pest prevention

The Agriculture Department is the County's first line of defense against invading pests including insects, plants, and plant diseases. Every day staff perform inspections on incoming shipments at destination points, including nurseries, the post office, and express carriers (UPS, FedEx and others) to look for quarantined plants as well as pests that can hitchhike unnoticed on plant material and other items such as household goods.



Cairo inspecting packages at UPS

In 2006, the Department was the first in the state to incorporate dog teams into parcel inspection. Since then a number of other counties have followed Contra Costa's lead. The dogs greatly speed inspections and have significantly increased detections of quarantined plants and exotic pests. The dog teams are a shared resource with other Bay Area counties that do not have the expertise or resources to maintain an active surveillance program; therefore, as a result of Contra Costa's initiative, pest detections in those counties have increased.

This year the Department inspected 28,588 shipments and rejected 61 after finding various pests.

The Department also deploys and services numerous traps for the purpose of early detection of 11 different serious insect pests. This year the Department deployed 5,782 traps, and staff serviced those traps 61,643 times.

- Pesticide use

This year the Department reduced its pesticide use from 76 lbs. of active ingredient in FY 15-16 to 68 lbs. in FY 16-17. This is a 95% reduction from FY 00-01 when the County began collating pesticide use figures.

Agriculture Department Challenges

- Ground squirrel control alternatives

The department continues to search for alternatives to treated grain bait. Unfortunately, raptor perches and live trapping of ground squirrels have proved to be ineffective and/or too costly. Ground squirrels are native to this area and will never be eradicated. Since the Department aims to create a fairly narrow buffer zone around infrastructure, it is inevitable that in areas with ground squirrel pressure outside of the 100 ft buffer, the animals will eventually move back into the burrows left vacant by the squirrels that have been poisoned, although this happens slowly. This leads to a yearly management program. Altering the environment to prevent ground squirrel burrowing is difficult because of the extent of the infrastructure that must be protected and because the squirrels favor human-built infrastructure as sites for their burrows.

- Invasive weed management on private land

The Department budget, labor pool, and other mandates have curtailed invasive weed management on private land. Without diligent landowners who include invasive weed control in their land management, invasive weeds will proliferate throughout the County.

Public Works Facilities Division

IPM Program Highlights

- Area under management

The Facilities Division manages 147 sites that comprise almost 3.3 million sq. feet.

- Subcommittee work

A representative from Pestec, the County's structural pest management provider participated as a member of the County's Bed Bug Task Force.

- New cockroach causing problems in County buildings

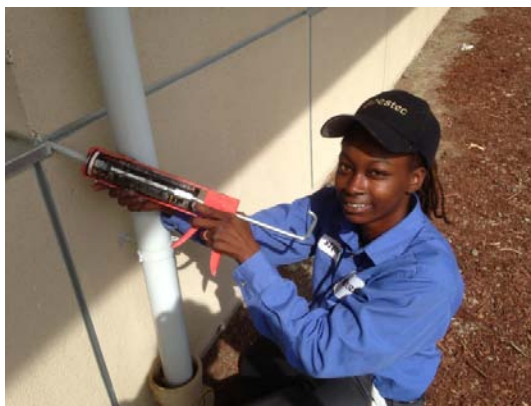
The three-lined cockroach (*Phyllodromica trivittata*) is native to the Mediterranean and was first submitted for identification to the California Department of Food and Agriculture (CDFA) in September 2009. The samples were collected by Dr. William Shepard of the University of California at his residence in Pinole. Although this was the first official submission of this cockroach to CDFA, this insect was known to be in Marin County as early as 2004. In Europe and North Africa this cockroach is found in leaf litter and plant debris in dry habitats around the Mediterranean. This corresponds to the habitat in which the cockroach is found in Contra Costa.



Three-lined cockroach (*Phyllodromica trivittata*)

The three-lined cockroach has been invading buildings across the County for two years. This year, Building 500 of the Public Works Administration complex and the Contra Costa Regional Medical Center, both in Martinez, were again plagued by infestations from the late spring through the fall. Winter temperatures seem to suppress populations. Building occupants have complained of cockroaches dropping from the ceiling, crawling on their desks and out of their files. They have found cockroaches in their coffee cups and yogurt, but since this insect does not eat human food, it is likely that the insects accidentally fell into those containers.

Because this cockroach does not feed on human food or garbage and commercial cockroach baits are formulated with a food attractant, commercial baits have not been effective in attracting the insects to consume the bait. Pestec has tried Niban® granular bait (5% orthoboric acid), MotherEarth® granular bait (5% boric acid), Advion® insect granule (0.22% indoxacarb), Maxforce Impact gel bait (1% clothianidin), spot sprays of Alpine water soluble granule (40% dinotefuran), and dusting window weep holes with diatomaceous earth. Maxforce Impact bait is the only product that has shown some promise in killing the three-lined cockroach.



Niyokee Jones of Pestec caulking at 255 Glacier.

The most persistent problem has been at Building 500 of Public Works Administration at 255 Glacier in Martinez. No bait or spot spray has provided relief. In September, the Facilities Manager, the



Small gaps in stucco that had to be filled on the exterior of Bldg 500 at 255 Glacier in Martinez to prevent cockroaches from getting in.

IPM Coordinator, and Pestec met with the occupants of Building 500 to explain the problem and the next steps: pest exclusion since this cockroach lives mainly outdoors.

Last year, Pestec had installed three brush-style doorsweeps at Building 500 that may have helped, but at the end of September this year, they began meticulously sealing all holes they could find on the exterior of the building. This cockroach is small and the holes were numerous. Pestec staff worked more than 51 person hours to complete this task. Since completion, there have been no three-lined cockroaches in the sticky monitoring traps inside the building.

- Ground squirrels at the West County Detention Facility and Alamo School
In late summer, Pestec staff conducted a demonstration of the Gopher X[®] machine for Grounds Division staff at both Alamo School and the West County Detention Center in Richmond. The Grounds Division has a machine that uses carbon dioxide to kill gophers and ground squirrels, but they were interested in observing the Gopher X, which uses carbon monoxide.
- Increased ant infestations in County buildings
Once again, County buildings experienced serious and repeated Argentine ant invasions, especially in the late summer and early fall. Pestec has been using various ant baits mainly with the active ingredient indoxacarb, boric acid, or borate.
- Structural IPM program pesticide use
In FY 16-17, 17 lbs. of pesticide active ingredients were used in and around the approximately 2.75 million square feet of County buildings that Pestec is contracted to manage. This is 14 lbs. less than last fiscal year. Ant baits and soap solution accounted for 87% of the pesticide used. Pestec continues to successfully manage rats and mice exclusively with traps, sanitation, and pest proofing.
- Bed bugs in County buildings
This year Calli House, the County's youth shelter in Richmond, experienced a bed bug infestation that required heat treatments. Pestec found numerous bed bugs of all stages in several rooms, so the infestation had been there for some time. Last year Pestec joined the IPM Coordinator to train the staff in prevention and inspection for bed bugs and in bed bug biology and habits, but staff changes may have contributed to a lapse in vigilance and enforcement of prevention procedures. In September, the IPM Coordinator and Pestec provided another training session in prevention to Calli House staff.

Facilities Division Challenges

- Pest exclusion in County buildings
This continues to be a challenge, but the Facilities Division is doing what they can with their limited staffing and schedule. The Division's first priority is to address health, safety, and access issues. As we saw this year at 255 Glacier in Martinez, pest proofing has a significant impact on reducing pest problems.
- Ant baiting
Pestec continues to review the products used for baiting along with their baiting strategy in order to try to provide better control for the very large ant populations seen in the last two years. They are also working on a proprietary bait station that they hope will be more effective in the County.
- Three-lined cockroach
This new insect presents a considerable challenge since it invades buildings and is not attracted to commercial cockroach baits. It may be that pest proofing is the only way to treat this problem in County buildings. If so, that will be expensive and time consuming; however, tight buildings will exclude many other pests besides the three-lined cockroach so that pest invasions overall will be reduced.
- Bed bugs in County buildings
The biggest challenge with bed bugs is in the County shelters. An outbreak at Calli Youth Shelter in Richmond and another at the Concord Shelter have shown that we cannot rest on the past 5 years of

success, especially if staff change. The IPM Coordinator will be working on providing regular refresher trainings along with educational materials for shelter staff.

Public Works Grounds Division

IPM Program Highlights

- Subcommittee work
Staff worked with the IPM Coordinator to create decision documentation for managing gophers in landscapes.

- Premium mulch from pallets and dead trees

This year the Grounds Division stockpiled about 700 cubic yards of woodchips ground from pallets, trees downed in storms, and trees killed by the drought. Considering that high quality wood chips cost \$32/cu yd delivered, this represents \$22,400 worth of mulch for the County.



Woodchips stockpiled at the Grounds Corporation Yard

because they are a uniform color and don't contain bits of trash or leaf debris. Sites that receive this mulch have been very pleased with the look. This can be important in gaining acceptance for landscaping with fewer plants and more mulch.

The Grounds' tree removal contract includes transport back to the Grounds Corporation Yard so the logs can be easily chipped. PGE, Davey Tree, and the Public Works tree crew deliver logs to the Corporation Yard that are too big for their chippers. Pallets come from a number of sources. The Grounds manager temporarily suspended delivery of logs and pallets because the storage capacity was reached in their yard; however, he has begun accepting deliveries again.

Staff continue to spread this woodchip mulch at various sites throughout the County. Where possible, trees are chipped and used onsite; otherwise chips are hauled from the Corporation Yard. The chips are of very high aesthetic quality



Logs and pallets awaiting chipping

- Using recycled water in County landscapes

There are now seven sites using reclaimed water:

1. 2467 Waterbird (Grounds Division offices)
2. 920 Mellus (Sheriff/Coroner)
3. 2530 Arnold (Summit Center--Assessor, Redevelopment, Risk Management)
4. Hemme Station Park in Alamo
5. Livorna Park in Alamo
6. Martinez Detention Facility
7. Pittsburg Health Center

- Managing gophers with trapping, CO, and CO₂
The Division vertebrate pest manager continues to use trapping and CO₂ for gophers in County landscaping. This year the Division hosted a demonstration of a device called Gopher X[®], which produces carbon monoxide to kill burrowing rodents. The Division is considering buying the device to use on ground squirrels, moles, and gophers.
- Pesticide use decreased in FY 16-17
Seven years ago, the Grounds Division consciously decided to eliminate the use of any insecticides, miticides, fungicides, or rodenticides in their work. The Division has chosen to manage arthropod pests and plant diseases in County landscapes solely with good horticultural practices. If plants are severely affected, they are removed.

Herbicides are the only pesticide used by the Division, and this fiscal year, staff used 129 fewer pounds than in FY 15-16. This represents a 67% reduction in pesticide use compared to FY 00-01 when the County started collating pesticide use records. As noted last year, the Division is continuing to try to improve the condition of many of the County's properties in order to move away from crisis management and back to preventive maintenance. For a number of years the lack of funding made it impossible to properly manage weed problems around County buildings and in the Special Districts the Division is responsible for. This is now changing, but weeds that went unmanaged for years left huge amounts of seed that will produce large crops of weeds for years to come.

Grounds Division Challenges

- Staffing needs
Grounds has 16 permanent employees (up from 15 last year), and 2 temporary employees. This is still fewer staff than the 18 permanent employees and 3 temporary workers in 2015.

The Division's Senior Lead Gardener retired at the end of September after 40 years of service. The position is still open. The Division is also looking to hire an irrigation specialist and at least one more gardener.
- Drought stress in the County
The Division continues to deal with a large number of diseased, stressed, and dying trees, although the death rate is slowing. Many redwoods in the County are partially dead and it could take from 5 to 10 years for them to die completely. Unless failing trees pose a hazard, the Division will take them down over time since it will be easier aesthetically and financially. It has been challenging to try to drought-proof landscapes, but the woodchips the Division is producing play an important role.

Public Works Department Roadside and Flood Control Channel Maintenance Division

IPM Program Highlights

- Subcommittee work
Staff worked with the IPM Coordinator to create decision documentation for vegetation management on County roads and to revise the decision document for vegetation management on flood control channels.
- Annual habitat assessment refresher training
This year, 42 Public Works Maintenance employees attended the annual refresher training on habitat assessment for endangered and threatened species in order to comply with the California Department of Fish and Wildlife (CDFW) Routine Maintenance Agreement (RMA). The RMA stipulates that before any work can commence in an area, an assessment must be conducted to identify endangered species habitat. In FY 16-17 crews that were trained to identify potential habitat spent a total of 303 hours performing habitat assessments. As endangered species are identified, they are reported to CDFW, which then

provides County staff with guidelines to move forward with work. These guidelines may include full time monitoring of the jobsite by a professional biologist.

- Flood control vegetation and erosion management using California natives

The County Flood Control District is partnering with The Restoration Trust, an Oakland-based non-profit organization promoting habitat restoration and stewardship, in a native planting experiment along Clayton Valley Drain (near Hwy 4 adjacent to Walnut Creek). The study is examining the survival of several California natives: Santa Barbara sedge, (*Carex barbarae*), common rush (*Juncus effusus*), Baltic rush (*Juncus balticus*), field sedge (*Carex praegracilis*), and creeping wild rye (*Leymus triticoides*).



December 2016: Volunteers learn how to properly plant grass plugs at the Clayton Valley Drain site.

The original planting occurred in December 2013, and over the past four years, the Contra Costa County Flood Control District, The Restoration Trust, Boy Scout Troop 239, and numerous hardworking volunteers have planted over 33,000 native grass and sedge plugs, removed over 1,500 pounds of trash, and helped restore native habitat along the Clayton Valley Drain.

The Division continues, at the request of The Restoration Trust, to occasionally spray the area for broadleaf weeds to reduce competition and provide the native plants with an advantage. The Division has also been providing hand and mechanical mowing, as requested.

The native species that were planted spread from underground rhizomes that anchor the soil and provide erosion control. They are perennial species that stay green year around and thus are resistant to fire. The plants are compatible with flood control objectives since they do not have woody stems, and during flood events, they lie down on the slope which reduces flow impedance. They are not sensitive to broadleaf-specific herbicides, and unlike non-native annuals, they provide carbon sequestration and remove as much as ½ ton of carbon per acre per year.

The Restoration Trust will monitor these plots until 2018 to assess native plant survival and the degree to which they compete with the non-native annual species.

- Owl and kestrel boxes on County property

The owl box installed at Livorna Park in August 2016 by Boy Scout Troop 815, in cooperation with the County Clean Water Program and the Public Works Special Districts Division, has housed its first family of owls. The box was cleaned in October and is ready for



Feathers and bones inside the Livorna Park owl box



Scouts with one of the completed owl boxes in Kubicek Basin

new occupants.

Public Works Special Districts, which manages Livorna Park, no longer uses rodenticide to control



Kestrel box in Kubicek Basin

rats in the park. Rats had been girdling plants along the edge of the park and rodenticide had been used to control

the population. Traps were also used, but nothing was caught in the traps. The plants have grown considerably and are no longer in danger from the gnawing, so the rat bait boxes have been removed from the park.

In May of this year, Eagle Scout David Bachofer with members of Boy Scout Troup 239 built and installed two owl boxes in Kubicek Basin along Pine Creek in Walnut Creek. The Scouts created a flyer and did outreach in the neighborhood about the benefits of increasing owl habitat in the area.

The owl boxes are designed for barn owls. A family of owls can consume 3,000 rodents (voles, mice, rats, and squirrels) during a 4 month nesting period. Since gophers spend most of their time underground, owls will likely have little impact on that rodent. It is important to note that although predators like owls can prune a rodent population, they will not control the population, especially considering the fecundity of these animals.

In September, members of the Peregrine Team of Pine Canyon erected two nest boxes for American kestrels in Kubicek Basin. This is a project of Native Bird Connections to increase kestrel habitat in the Mt. Diablo region.

- Grazing as a vegetation management tool

The Division continues to use grazing as an effective tool for vegetation management, mainly on flood control facilities. Using grazing to manage vegetation is complicated and very dependent on site-specific conditions. Grazing is not appropriate in all situations and could not, for instance, be used on the side of County roads without endangering both the animals and motorists. Many factors raise or lower the cost per acre for grazing, including the size of the parcel (at



Pine Creek before grazing

larger sites the cost of moving the goats in and out is spread over a number of acres), whether the animals can easily enter the site, the amount of fencing necessary, how many times the animals must be moved within the job site coupled with the ease with which that can be done, whether water is available or must be trucked in, and the season in which the animals are being used (costs are lower when demand is lower, e.g., in fall and winter).



Pine Creek after grazing

- Ideal grazing situations for fire prevention

The Division has found that the following situations are ideal for meeting fire prevention standards with grazing:

1. Sensitive sites with endangered or threatened species where mowing could kill animals and where herbicides are restricted
2. Sites where access is difficult for people or machines
3. Sites with steep slopes or uneven terrain that would have to be mowed by hand and that present dangerous working conditions for staff
4. Sites that are too wet for either hand or machine mowing

- Areas not suited for grazing

1. One to two acre sites are not economical because of the cost of getting the animals in and out.

2. Unfenced areas along roadsides are not appropriate because of safety issues and because of the cost of fencing off a narrow band of land and continually moving animals along the road.
3. In the winter, grazing animals cannot be used on the rain softened creek banks and the ground adjacent to the banks because of the danger of causing erosion.

- Advances in grazing strategy

The Division continues to take advantage of the time after a site has been grazed. When goats remove vegetation, staff can inspect flood control facilities much more effectively. Goats are used to prepare



Goats on Rodeo Creek

various creeks for their annual or biennial inspection by the Army Corp of Engineers. This makes the Corp's job much easier, for which they are very grateful.

Staff have always monitored the integrity of the slopes and the presence of invasive and other problematic weeds, but when vegetation is very low, it is much easier to see the condition of the flood control facilities and easier to spot treat for hard-to-control weeds. This combination of grazing and herbicides has proven very effective.

- Grazing costs

Costs vary widely among sites. This year costs ranged from \$1,225/acre to graze Rodeo Creek to

\$546/acre to graze Trembath Basin. Difficult access and no water greatly increase the cost. Although Rodeo Creek has water available, there are access issues for off-loading and loading the goats. Trembath Basin is 15 acres of open area with water and easy access.

- Using mulch for weed suppression

The effects of the drought continue to kill thousands of trees in the County. The Division chips prunings and dead trees into mulch that is being used more extensively along fencelines above flood control channels and in empty County parcels. Logs that are too large for the Division's chipper go to the Grounds Division for chipping and use on County landscapes.



Mulch along the access road on Walnut Creek

- Diseased and beetle infested trees

This year the Division spent considerable time removing dead trees infected with sudden oak death (SOD), pine pitch canker, and pine bark beetles. These trees must be chipped or otherwise disposed of onsite to prevent spread of disease or infestation. These tree problems, especially the pine bark beetles, may have been exacerbated by the prolonged drought of the previous years that stressed and weakened many trees in the County.

- Fire fuel reduction challenges in 2017

Fire prevention weed abatement is time-sensitive, and historically the deadline has been July 1. If weed abatement was not completed by that date, the County could incur fines from the fire districts. In FY 16-17, the wet winter created a very large volume of weeds to be managed. This year fire districts were requiring weed abatement to be completed in some areas by May 30. The Routine Maintenance Agreement with the state Department of Fish and Wildlife stipulates that no work can begin in Contra Costa flood control channels prior to April 15. Once again, it was impossible for staff to complete all the mowing in the short four to six week window available before the deadline. Because some flood control

channels were mowed so early in the season, crews had to return to mow them a second time because vegetation had grown back.

Along flood control channels, the weed abatement crew is applying pre-emergents around gates, fencelines, and flood control structures so that when mowing crews come through, they can spend less time hand mowing thus making it more likely that the County can meet its fire fuel reduction deadlines.

- Buffer zones for certain pesticides enjoined by the courts

Several lawsuits brought by environmental organizations against the EPA have been temporarily settled by the delineation of buffer zones in and around habitat for a number of endangered or threatened species in the Bay Area. The Department continues to work within the guidelines of the injunctions to assess work sites and implement buffer zones before using any of the enjoined pesticides.

Roadside and Flood Control Maintenance Division Challenges

- Erratic weather conditions

With record rainfall in Contra Costa County during the 2016-17 winter, the Division faced a number of challenges. In January, flooding on Pinole Creek washed out a 70-ft. section of Alhambra Valley Road at Castro Ranch Road. The road is still closed for ongoing repairs. A portion of Morgan Territory Road near Whispering Pines Road failed and slid down the hill in February. There were numerous mudslides, drainage problems, and downed trees on many other roads in the County. Road maintenance crews were busy addressing storm-related damage to roads and removing downed trees from January through May which slowed the Division's regular vegetation management schedule.



The drought of the previous 5 years created conditions that selected for the tougher and weedier plant species along the roads and flood control channels. The dry soil conditions suppressed the growth of some weeds, and without competition, the hardier weeds had more room and freedom to grow. This winter's abundant rainfall has allowed these problem species to thrive and expand their foothold. Crews

continue to see an increase in kochia (*Bassia* sp.), Russian thistle (*Salsola* spp.), fleabane (*Conyza* sp.) and mare's tail (*Conyza canadensis*), all weeds that emerge late in the season and are difficult to control. Stinkwort (*Dittrichia graveolens*), another late emerging weed, has spread dramatically throughout the County. Volunteer trees have sprouted in abundance in response to the rain.

- Cost implications of regulations

Compliance with Routine Maintenance Agreement (RMA) requirements has considerable effect on the cost of operations. As mentioned above, work within CDFW jurisdiction requires a habitat assessment prior to start of work so that RMA-listed species are not harmed. Crews again identified listed species at a couple of job sites and consultation with CDFW resulted in using alternative work methods that were more costly.

Three years ago, the CalFire increased the safety requirements for mowing, and these measures



Morgan Territory Road near Whispering Pines Road
Winter 2017

continue in effect. These measures help prevent fires and injuries to workers but increase the cost of mowing.

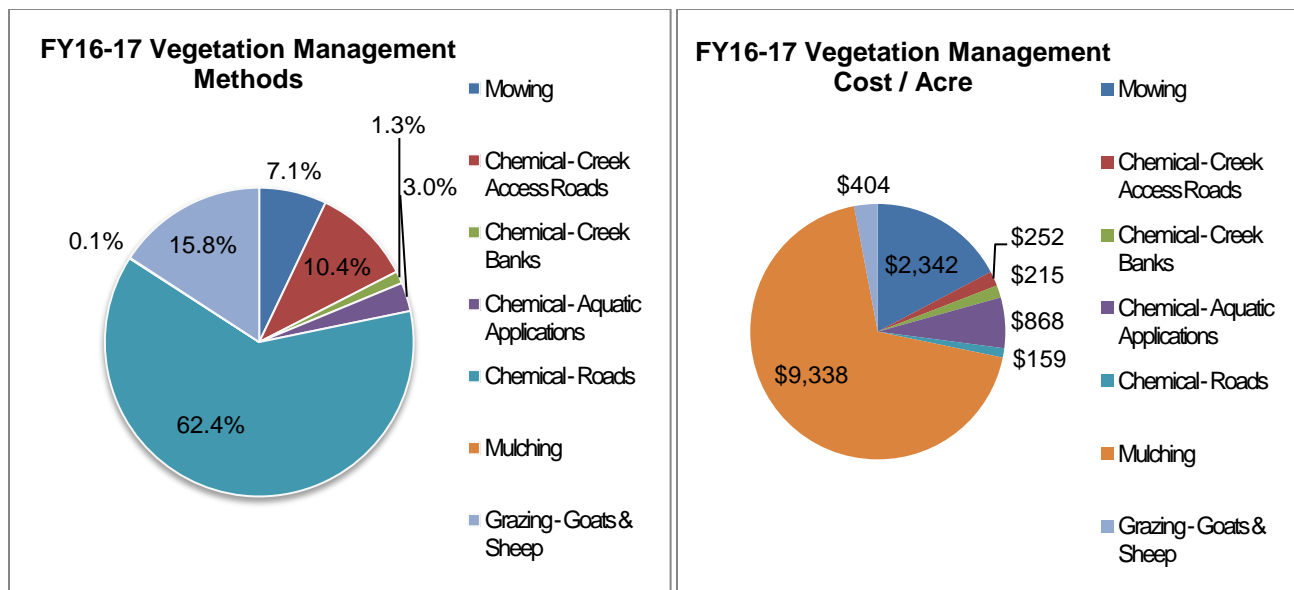
1. Crews must have access to a water truck or a 5 gallon backpack type water fire extinguisher.
 2. A worker trained in using the fire-fighting equipment on the truck must be added to a mowing crew to continuously monitor the weather and serve as a lookout.
 3. If the height of the vegetation requires that a worker scout the ground ahead of the mower, a separate person must be assigned to perform that function.
 4. If the ambient air temperature reaches 80° F, the relative humidity is 30% or lower, or if wind speeds reach 10 mph or higher, mowing cannot begin or must stop immediately.
- Cost implications of various management techniques
In FY 16-17, 60% of the Division's expenditures on vegetation management was spent on non-chemical treatment methods, on 23% of the total acres treated (see the table below for details).

A Cost* Comparison of Vegetation Management Methods for Roadsides and Flood Control Channels Fiscal Year 2016-17

Vegetation Management Method	Acres Treated	% of Total Acres Treated	Total Cost for all acres treated	Cost/Acre	% of Total Cost for all acres treated
Chemical Treatment - Roads	1014	62.4%	\$161,427	\$159	25%
Right of Way Mowing	115	7.1%	\$269,329	\$2,342**	42%
Chemical Treatment – Creek Access Roads	169	10.4%	\$42,590	\$252	7%
Chemical Treatment – Creek Banks	21	1.3%	\$4,515	\$215	0.7%
Grazing – Peak and Off Season	257	15.8%	\$103,910	\$404	16%
Chemical Treatment - Aquatic Applications	49	3.0%	\$42,523	\$868	7%
Mulching	1.2	0.1%	\$11,205	\$9,338	2%
Totals	1626		\$635,499		

* The cost figures above for each method include labor, materials, equipment costs, contract costs (for grazing), and overhead, which includes training, permit costs, and habitat assessment costs. Licensing costs for staff members are paid by the individual and not by the County. The cost of the Vegetation Management Supervisor when he supervises work is not included in any of the figures, but is comparable among the various methods.

** The cost of right-of-way mowing continues to increase due to new fire prevention regulations (FY13-14=\$762/A; FY14-15=\$828/A; FY15-16 \$1,445/A, FY 16-17 \$2,342).



Note: The legend to the right of the pie chart identifies slices starting from 12 o'clock and continuing clockwise.

With limited budget, staff, and equipment, the Division must make strategic decisions about where to deploy their resources in order to meet their mandates of managing vegetation for fire and flood prevention and for road safety. The Division is managing weeds in a biological system, and factors such as weather, rainfall, weed growth patterns, timing for optimum weed susceptibility to the treatment method, and threatened and endangered species issues must also be factored into management decisions. The pie charts above further illustrate the cost of various management techniques and show how the Division has allocated resources.

- Weather

Mowing, as well as the application of herbicides, is highly dependent upon weather conditions. Weather can affect when herbicides can or must be applied and can also affect when mowing can or should occur. Weather can substantially alter the size and type of the weed load or its distribution over time and space. The Department has a limited capacity to use mowing because of a number of factors including vacancies in vegetation management staff, the Department's limited budget for weed abatement, and the limited number of tractor mowers (two). The Department faces a continued challenge of balancing the use of herbicides to control weed growth with the Department's capacity to mow or to graze with goats or sheep within the confines of the budget and the timeline to prevent fires.

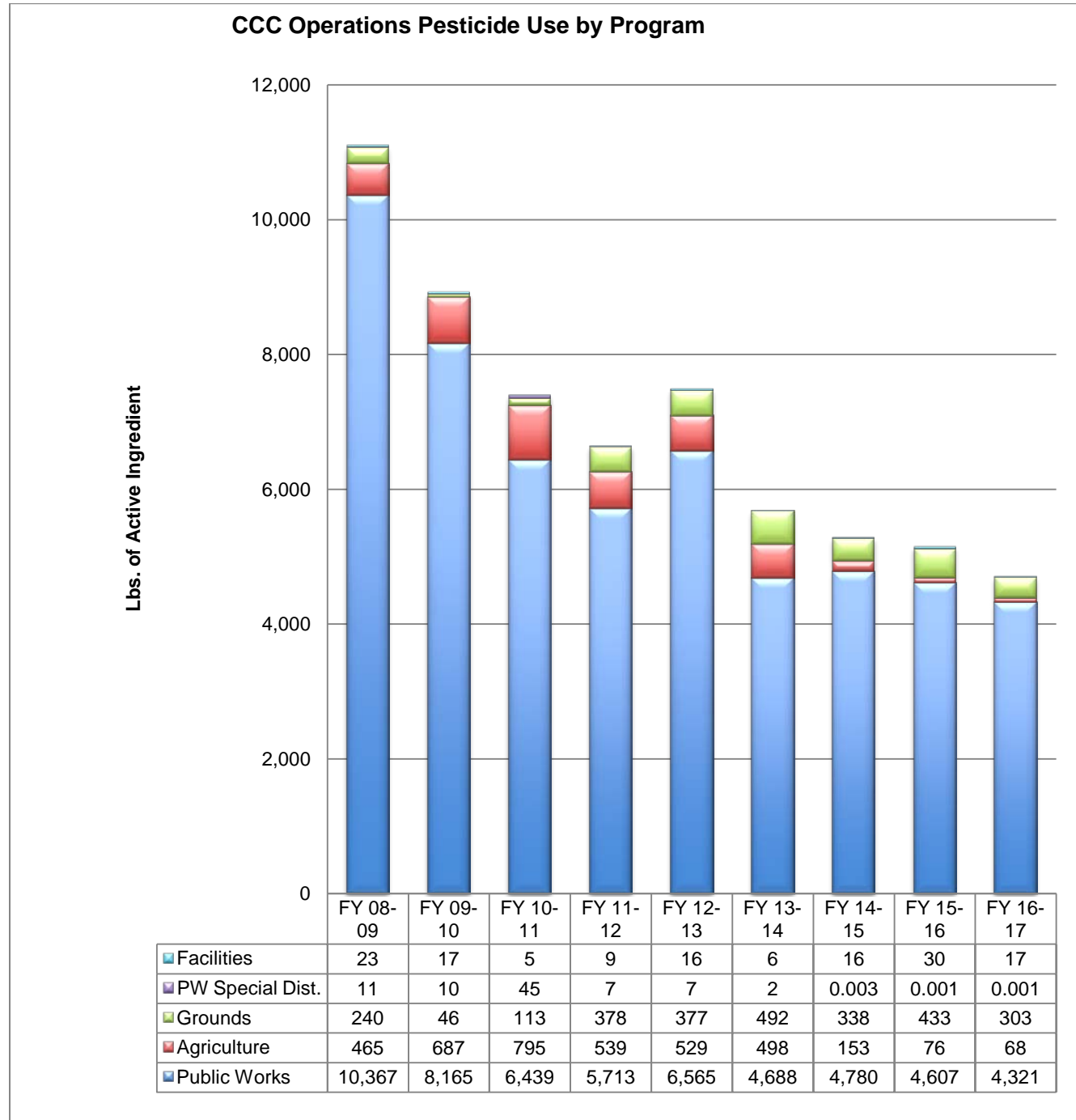
Using mowers during hot, dry weather also poses a hazard of its own: sparks caused by the metal mower blades striking rocks or metal debris can ignite tinder-dry grass.

- Staffing

The Vegetation Management crew is still understaffed with 4 personnel as compared to a staff of 6 in 2009, and is without a supervisor. Full staffing would consist of 3 vegetation management techs, two senior vegetation management techs, and one supervisor. Currently the crew is short 1 vegetation management tech, 1 senior tech, and has no supervisor. Peter Gollinger, who had been the Vegetation Management Supervisor and was promoted to Assistant Field Operations Manager, has now left the County for a job with the City of Palo Alto.

Pesticide Use by Contra Costa County Operations

Starting in FY 00-01, the IPM Task Force annually reported pesticide use data to the Transportation, Water, and Infrastructure Committee for the County departments involved in pest management. The IPM Coordinator has continued this task. Below is a bar chart of pesticide use over the last 9 years. For information on pesticide use reporting and for more detailed pesticide use data including total product use, see Attachment C and the separate County Pesticide Use Spreadsheet.



Decrease in Pesticide Use by County Operations

In FY 16-17, all County Departments reduced their pesticide use from the previous fiscal year. Since FY 00-01, the County has reduced its use of pesticide by 75%. Note that pesticide use fluctuates from year to year depending on many factors.

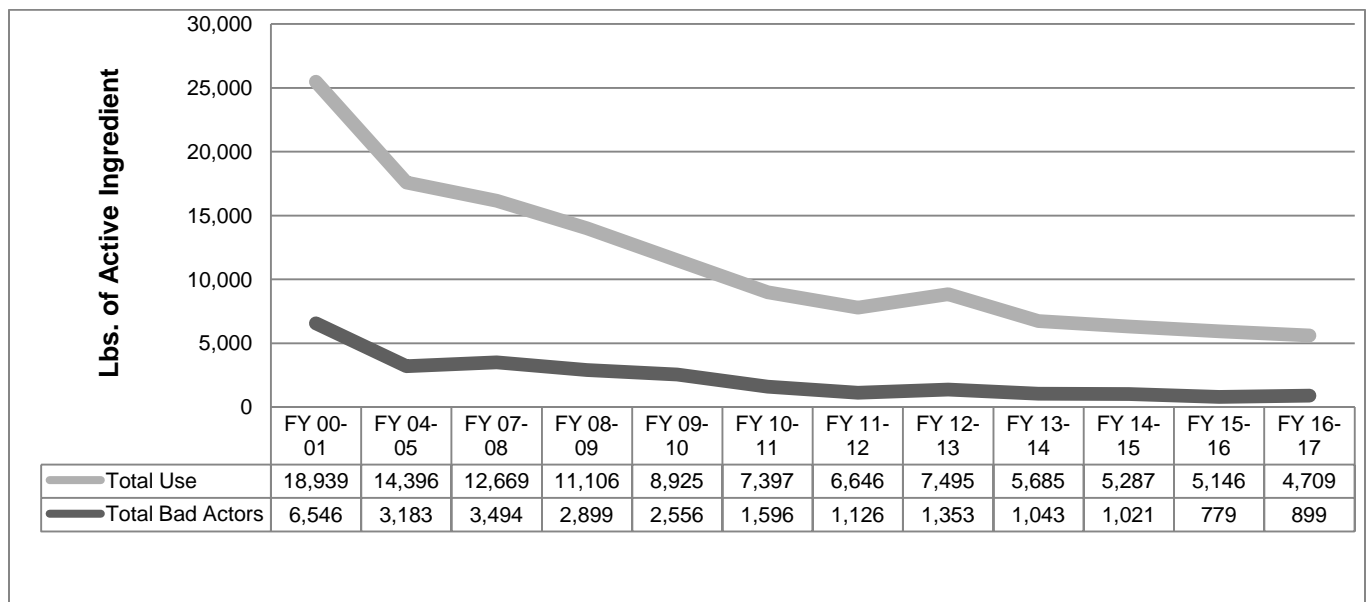
Concern about “Bad Actor” Pesticides

There has been concern among members of the public and within the County about the use of “Bad Actor” pesticides by County departments. “Bad Actor” is a term coined by the Pesticide Action Network (PAN) and Californians for Pesticide Reform to identify a “most toxic” set of pesticides. These pesticides are at least one of the following: known or probable carcinogens, reproductive or developmental toxicants, cholinesterase inhibitors, known groundwater contaminants, or pesticides with high acute toxicity.

Parents for a Safer Environment has requested that additional pesticides be reported as “Bad Actors”, but in 2013 after studying this request and consulting Dr. Susan Kegley, who was instrumental in developing the PAN pesticide database, the IPM Advisory Committee decided that the County will report as “Bad Actor” pesticides only those that are designated as such in the PAN database.

The County’s use of these particular pesticides has decreased dramatically since FY 00-01 as shown in the graph below. In Fiscal Year 00-01, County operations used 6,546 lbs. of “Bad Actor” active ingredients and this year used 899 lbs.

CCC Operations Total Pesticide Use vs. ‘Bad Actor’ Use



Rodenticide Use

The Department of Agriculture uses rodenticide for ground squirrels whose burrowing threatens critical infrastructure in the County, such as roads, levees, earthen dams, and railroad embankments. In Special Districts, at Livorna Park and around the playing field at Alamo School, gophers, moles, and voles are managed by trapping with occasional limited use of rodenticides.

“First generation” vs. “second generation” anticoagulant rodenticides

Anticoagulants prevent blood from clotting and cause death by internal bleeding. In small doses they are used therapeutically in humans for a number of heart ailments. Vitamin K₁ is the antidote for anticoagulant poisoning, and is readily available. (There are some types of rodenticides for which there is no antidote.)

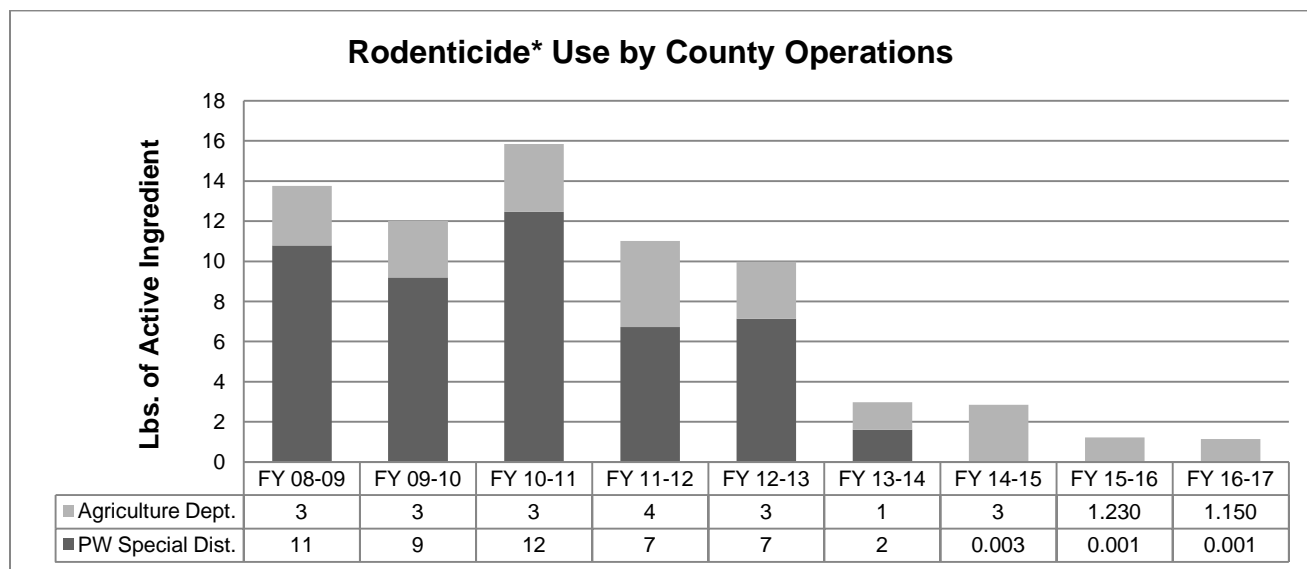
When anticoagulant rodenticides are necessary, the County uses first generation anticoagulant baits. First generation anticoagulants require multiple feedings over several days to a week to kill.

Second generation anticoagulants are designed to kill after a single feeding and pose a greater risk to animals that eat poisoned rodents. If the rodent continues to feed on a second generation 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. Because rodents poisoned by second generation anticoagulants can carry a heavier load of more toxic poison that persists in their bodies for a long period of time, the risk of death is increased for a predator that eats rodents poisoned by second generation anticoagulants.

The first generation materials are cleared much more rapidly from animal tissues and have a much reduced potential for secondary kill when compared to second generation materials. However, the first generation anticoagulants can also kill animals that eat poisoned rodents.

As noted earlier in this report, the Agriculture Department has revised its ground squirrel baiting procedure to reduce the amount of treated grain used. The Agriculture Department also mitigates the risk of secondary poisoning by performing carcass surveys in all areas treated with anticoagulants whether or not it is required by endangered species restrictions.

Only the Agriculture Department and Special Districts use rodenticides. Below is a bar chart to illustrate the decline in rodenticide use by the County.



* The Agriculture Department uses primarily diphacinone treated grain bait, but in years past they also used some gas cartridges as fumigation agents.

From FY 14-15 to the present, Special Districts has used only diphacinone, but in years past, their use was more than 99% aluminum phosphide, which is a fumigant and not an anticoagulant rodenticide.

Trends in Pesticide Use

A change in pesticide use from one year to the next does not necessarily indicate a long-term trend. Long-term trends are more meaningful than short-term changes. It is important to understand that pesticide use can increase and decrease depending on the pest population, the weather, the invasion of new and perhaps difficult to control pests, the use of new products that contain small percentages of active ingredient, the use of chemicals that are less hazardous but not as effective, the addition or subtraction of new pest management projects to a department's workload, and cuts to budgets or staff that make it difficult or impossible to use alternate methods of control.

The County's pesticide use trend follows a trend typical of other pollution reduction programs. Early reductions are dramatic during the period when changes that are easy to make are accomplished. When this "low-hanging fruit" has been plucked, it takes more time and effort to investigate and analyze where additional changes can be made. Since FY 00-01, the County has reduced its use of pesticide by 75%. If further reductions in pesticide use are to be made, it will require time for focused study and additional funding for implementation.

Departmental Integrated Pest Management Priorities For 2018

Agriculture Department Priorities for 2018

- Continue the County's highly effective invasive weed program
The Agriculture Department will give priority to weed work under contract with local parks and municipalities. Artichoke thistle and purple starthistle will remain the primary target weeds for the 2018 season. The Department will move toward a more collaborative role with private landowners and will encourage landowners to take the primary role for weed control on their properties.

The Department will continue to respond to any "A rated" weed that enters the county with surveys and treatment.

- Ground Squirrel Management Program

The Agricultural Department will continue to provide information and resources to the County, municipalities, growers, and the general public on the control of ground squirrels. Without effective control measures, ground squirrels will damage crops, and infrastructure such as earthen dams, levees, and highways. The economic and environmental consequences would be substantial.

Over the years the Department has experimented with raptor perches, exclusion techniques, and live trapping as alternatives to traditional baiting. Although some of these methods could provide reasonable control with small, limited infestations of ground squirrels, all of these methods are considerably more costly and less effective on a larger scale. The Department continues to search for the most effective, least toxic, and most economical ways to reduce ground squirrel damage to a tolerable level within our county by consulting with researchers, the University of California Cooperative Extension Service, the California Department of Food and Agriculture, other counties, and with industry.

Public Works Department Priorities for 2018

Facilities Division

- Continue working to fix structural deficiencies in County buildings
- Continue monitoring the bed bug situation in County buildings and providing awareness training if necessary

Grounds Division

- Fill the Grounds Supervisor position
- Continue removing hazard trees and trees killed by the drought—where appropriate and where there is funding, trees will be replaced with drought tolerant species
- Continue installing smart irrigation controllers throughout the County, and continue to conserve water as much as possible
- Continue diverting green waste from the landfill by chipping prunings and using the material in place
- Continue chipping large logs from PGE, tree companies, and Public Works Maintenance for mulch—the mulch will be used to suppress weeds wherever possible
- Continue hand weeding wherever and whenever feasible—using mulch facilitates hand weeding
- Continue educating the public to help them raise their tolerance of weeds
- Continue working on the rejuvenation of aging County landscapes
- Continue raising the level of service on County property

Roadside and Flood Control Maintenance Division

- Fill the Vegetation Manager position
This position has been vacant for several years. The County has had difficulty in attracting candidates who possess the minimum requirements for the job.
- Ensure continuity in the vegetation management program as the Assistant Field Operations Manager/Vegetation Manager leaves the County for another job
This will be important for maintaining the high quality of the vegetation management program.
- Continue to refine IPM practices
The Division would like to incorporate more innovation into the vegetation management program, and will be looking at testing and/or incorporating new vegetation management techniques, technology, software, equipment, machinery, and chemicals.
- Coordinate work efforts more closely with other Public Works Department crews
There are many instances where the Vegetation Management Crew could anticipate performing work that can aid other Department crews such as Road Maintenance, Flood Control, and Airport Operations.

Attachment A.

- **Report of the Decision-Making Subcommittee to the Contra Costa County IPM Committee**

- **Decision-Making Documents**
 - **Gophers in County Landscaping**
 - **Vegetation on Roadsides and Rights-of-Way (draft)**
 - **Vegetation on Flood Control Channels (draft)**

Report of the Decision-Making Subcommittee to the Contra Costa County IPM Advisory Committee

Prepared by Andrew M. Sutherland, Subcommittee Chair, and Tanya Drlik, IPM Coordinator

November 2017

Members

Susan Captain

Jim Cartan

Jim Donnelly – vice chair

Andrew Sutherland - chair

Larry Yost

During the past year, the Decision-Making Subcommittee, as a service to the Contra Costa County IPM Advisory Committee and the residents of the County, continued its work to document situation-specific pest management decision-making processes and to revise existing decision documents. The subcommittee is charged with making recommendations that may improve the County's pest management processes while considering the needs of the communities affected, seeking to minimize negative impacts, and attempting to maximize efficiency associated with pest management programs.

Since our last report (September 2016), the Decision-Making Subcommittee has met six times: October 27, December 12, January 20, May 11, June 29, and August 3. The subcommittee will also meet on September 14 and October 12, 2017. For this report, recent activities have been grouped into three broad themes below: pest management in Special Districts, weed management along rights-of-way, and ground squirrel management by the Department of Agriculture.

Special Districts and County Landscape Standards

In 2016, the subcommittee began work on a decision-making document for gophers in County landscapes. This document was finalized in May 2017 and is attached to this report. Work on this document led to a series of conversations with Special Districts staff members about pest management contracts and the County's Landscape Standards, which informs the work of County staff and contractors engaged in pest management. The subcommittee made recommendations on revisions to the pest management section of the Standards and discussed the suggestions with Special Districts staff. All the subcommittee's recommendations were adopted and are now reflected in the current version of this County document. The revised pest management section can be found under "Maintenance" in the Standards at <http://www.contracosta.ca.gov/2147/Landscape-Standards>. The subcommittee believes these changes will clarify the IPM process by emphasizing monitoring for pests, use of nonchemical tactics, and consideration of the nontarget effects associated with pesticide use. The subcommittee recommends a continuation of the Special Districts' outreach efforts to County contractors and residents in these areas to help them understand the IPM process. This helps alert residents to pest management activities in their communities so they might be more invested in the process.

Weed management along rights-of-way

The subcommittee also continued work on documenting decision-making for vegetation management along County road rights-of-way. The draft decision-making document is attached.

A separate document has been created for vegetation management along flood control channels and is under review by the subcommittee. The draft document is attached.

In 2016 and 2017, subcommittee members and County staff interviewed vegetation managers from the counties of Alameda, Yolo, San Mateo, Santa Clara, and Solano about their management practices, equipment, and budgets.

The subcommittee recommends that the IPM Advisory Committee consider convening a panel of county vegetation managers from around the Bay in order to understand IPM strategies used elsewhere. Information from

Bay Area colleagues could help guide the conversation about the County's existing programs, available alternatives, and recommendations for the future.

Funding is the limiting factor for vegetation management programs in all counties. Funding for road maintenance is a complex issue, so in September 2017 the subcommittee arranged a presentation on the subject before the full IPM Advisory Committee from the head of the Public Works Maintenance Division.

At this point, it appears that mowing is the only viable alternative to pesticide use for vegetation management along roadsides in Contra Costa. The County already uses a mix of mowing and pesticides along roads, but there are questions and issues associated with increasing the amount of mowing. For example:

- How many areas are actually suitable for mowing? Many of the County roads are constructed on terrain that cannot be mowed because of trees, rocks, and utilities infrastructure.
- How much would it cost to mow the suitable roadsides?
 - Currently, about 60% of the County's expenditures on vegetation management are spent on non-chemical treatment methods (mainly mowing and grazing). This is spent on about 23% of the acreage managed (includes both roadsides and flood control channels).
 - How many more staff would be needed to mow all suitable roadsides?
 - Would the staff have to be new hires or could they be moved from other duties?
 - What kinds of new equipment would be needed?
 - How many times per year would those areas have to be mowed? Without adequate staff and equipment to mow weeds at the proper time, they can regrow and require multiple mowings.
- How are other counties, especially those with larger vegetation management budgets, funding their programs?
- How does the dollar amount of gas tax revenue (the primary funding for road maintenance) received vary in counties on a per mile managed basis?
- The County is under strict fire prevention regulations, and any changes in vegetation management would have to conform to those regulations. How would that affect where and how many times areas might have to be mowed?
- County salaries and benefits have been a stumbling block to hiring new employees in the Maintenance Division. How long would it take to hire new employees if they were needed? Would salaries and benefits need to be increased in order to attract people?
- The County's Climate Action Plan, adopted by the Board of Supervisors in 2015, requires Contra Costa to reduce its greenhouse gas emissions by 15% below 2005 baseline levels by 2020. On-road vehicles currently account for about 45% of the County's emissions. Increasing the use of large diesel powered mowers and trucks would increase significantly the greenhouse gas emissions by County operations, especially if areas required multiple mowings per season.

The Public Works Roadside and Flood Control Maintenance Division has reduced its use of pesticide by 74% since FY 2000-2001. If the Board of Supervisors chooses to make further reductions of pesticide use along rights-of-way a priority, funding for vegetation management will have to be increased.

Ground squirrel control by the Department of Agriculture

In 2013, the Decision-Making subcommittee created a decision document for ground squirrels in critical infrastructure. In May 2017, the subcommittee decided to review the document because this pest situation is responsible for the largest County use of anticoagulant rodenticide. The nontarget issues surrounding use of anticoagulants continue to be important to the County and its residents. The review process is ongoing.

Contra Costa County

Decision Documentation for Gopher Management in Landscapes

Date: 5/24/17

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?	<p>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.</p>
Who has jurisdiction over the areas in question?	<p>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.</p> <p>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.</p>
How often are the sites monitored?	<p>This varies from site to site.</p> <p>In the course of her other work, the Grounds Division gopher manager surveys for evidence of gophers. She also responds to complaints about gophers from County staff and to information relayed by other members of the Grounds crew.</p> <p>The vertebrate pest manager 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.</p>
The problem species has been identified as the following:	<p>Pocket gopher, <i>Thomomys</i> sp.</p> <p>From the UC IPM Pest Notes on pocket gophers (http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html):</p> <p>"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.</p> <p>"...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."</p>

	<p>Gophers sometimes girdle trees and shrubs and can kill trees with trunks several inches in diameter.</p> <p>Gophers also mix, aerate, and loosen soil, all of which can promote plant growth.</p>	
What is the tolerance level for this species?	<p>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.</p>	
Are these sensitive sites?		
	Are any sites under management part of any of the court-ordered injunction?	No for the 2 sites where rodenticide might be used: Hidden Pond and Driftwood.
	Are any of the sites known or potential habitats for any endangered or threatened species?	No
	<p>Are any of the sites on or near an area where people walk or children play?</p> <p>Care must be taken when using gopher traps, so that neither pets nor children are likely to encounter them.</p>	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?	<p>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.</p>	
What factors contribute the cost of gopher management?	<ol style="list-style-type: none"> 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 	

	<p>longer to find and trap gophers or kill them with CO₂.</p> <p>6. The frequency of re-invasion—sites near open fields, vacant lots, construction sites, and wildlands will experience repeated gopher invasions.</p>
Are special permits required to trap or otherwise kill gophers?	<p>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.</p>
Which cultural controls were considered?	<p>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.</p> <p>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.</p> <p>Conclusion: There are no practical or effective cultural controls for gophers in County landscaping.</p>
Which physical controls were considered?	<p>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.</p> <p>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.</p> <ul style="list-style-type: none"> • 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) 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. <p>In an April 2013 paper in <i>Crop Protection</i>, 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.</p> <ul style="list-style-type: none"> • 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. <p>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. Approximately 5 years ago, 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</p>

	<p>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.</p> <p>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.</p> <p>Conclusion: Trapping is the most effective and practical physical control for gophers in County landscaping.</p>
Which biological controls were considered?	<p>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.</p> <p>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.</p> <p>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.</p>
Which chemical controls were considered?	<p>The risk to predatory animals must be considered before any rodenticides are used for gopher management.</p> <p>Fumigants</p> <p>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.</p> <p>CO₂ Injection</p> <ul style="list-style-type: none"> • The Grounds Division has purchased a CO₂ injection 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 CO₂ initially sinks to the floor of the burrow. • The gopher manager uses this device where foot traffic prohibits the use of traps. • The manger uses the same preliminary procedures for using this device as she used for trapping (see above). • Before she deploys the device in the burrow, she closes any openings and flattens any remaining mounds to help keep the gas inside the burrow. • When the trigger on the device is pulled, there should be no hissing sounds. • The day after the treatment the manager returns to determine the success of the treatment. <p><i>A note on "signal words," below: these designations from the USEPA pertain to the acute toxicity of a pesticide.</i></p> <p>Aluminum Phosphide</p> <p>Signal Word: DANGER</p> <ul style="list-style-type: none"> • Fumigation with aluminum phosphide <u>is</u> 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.

	<p>Baiting</p> <p>Diphacinone (005%) Multiple Dose Bait Blocks (Eaton's Answer®)</p> <p>Signal Word: CAUTION.</p> <ul style="list-style-type: none"> • This product overcomes a shortcoming of grain baits, which can degrade in the moist soils inside gopher tunnels. It is blended with a water-resistant paraffin material and formulated in bait blocks. This bait was developed with the objective of providing long-term control because the bait remains effective in moist environments after killing resident gophers. Then, newly invading gophers feed on the bait and die as well. • Bait blocks are placed underground in the main tunnel, about 4" to 12" deep and then covered. Usually one block is used for an approximately 20' run of main tunnel where fresh mounds are found on the surface. <p>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.</p> <p>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.</p> <p>Conclusion: CO₂ injection seems to be useful for the Grounds Division, but more experience with the tool is necessary.</p> <p>Diphacinone bait blocks are used from time to time at Hidden Pond and Driftwood. The landscaping in these two areas is located on frontage property. The County does not have control over the fees assessed for maintenance on these properties and the budget is currently insufficient to afford trapping as a control for gophers.</p>
Recommendations from the IPM Advisory Committee	<p>On-going monitoring should be used to adjust control activities to a level appropriate to the population of gophers. Trapping and CO₂ injection are the preferred control methods when sufficient funding is available.</p> <p>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.</p>
References	<p>UC IPM Pest Notes on pocket gophers: http://www.ipm.ucdavis.edu/PMG/PESTNOTES/pn7433.html</p> <p>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, <i>Crop Protection</i>, 46: 7-12.</p> <p>Baldwin, Roger. Personal communication</p>

Contra Costa County

DRAFT DECISION DOCUMENTATION for VEGETATION MANAGEMENT

on County Roadsides and Road Rights-of-Way

Date: February 3, 2017

Department: Public Works Maintenance Division

Location: Unincorporated rural areas

Situation: Vegetation management along roadsides and road rights-of-way

Note that management decisions are site specific for roads. Not every management technique will work equally well at all sites and for all weeds, and the costs of each technique will vary depending on the site. The County has developed a flowchart to aid the decision-making process.

<p>What are the management goals for these sites?</p>	<p><u>To reduce fire risk:</u></p> <p>The County is subject to the regulations of 9 separate fire districts. The following are the districts and the links to their regulations (if available):</p> <ul style="list-style-type: none"> • Contra Costa Fire Protection District (ConFire) http://www.cccfpd.org/pdfs/WA-2-minimum-standards-17.pdf • Crocket-Carquinez Fire Protection District (regulations not apparent on website) • East Contra Costa Fire Protection District (same regs as ConFire) • Kensington Fire Department (same regs as Richmond) • Knightsen Fire District (no website) • Moraga-Orinda Fire District http://www.mofd.org/literature_196457/Exterior_Hazard_Abatement_Standards • Pinole Fire Department (regulations not apparent on website) • Richmond Fire Department http://www.ci.richmond.ca.us/DocumentCenter/View/38822 • San Ramon Valley Fire Protection District -- http://www.firedepartment.org/civica/filebank/blobdload.asp?BlobID=4207 <p>The County manages to the most restrictive regulations of the 9 fire districts, which are described in the County's fire protection ordinance:</p> <p>Title 7, Division 722, Section 320.4.1 says, "No person who has any ownership or possessory interest in or control of parcel of land shall allow to exist thereon any hazardous rubbish, weeds, trees, or other vegetation that constitutes a fire hazard."</p> <p>Title 7 Division 722, Section 320.4.2.1 says, "The Fire Code Official is authorized to cause areas within 10 feet (3048 mm) on each side of portions of streets which are improved, designed, or ordinarily used for vehicular traffic to be cleared of flammable vegetation and other combustible growth."</p> <p>The Public Works Department tries to maintain an 8 foot strip, where practical, of vegetation-free ground (not including trees, shrubs, or landscaping) along each side of a road. Fire district regulations stipulate that vegetation management must typically be completed by May 1, and at the very latest by July 1, in order to avoid abatement notices from the local fire district. The May 1</p>
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	<p>deadline is a recent change and makes it more difficult for the crew to perform all the needed work between the time that weather conditions permit work and May 1.</p> <p><u>To maintain road safety:</u> The County maintains road safety in accordance with the County's best management practices. The following are some of the management practices:</p> <ul style="list-style-type: none"> • Prevent sight line obstruction of signs, pullouts, ditches on sides of road, obstacles on sides of the road (California Streets and Highways Code, Sections 1480-1485) • Prevent a perceived narrowing of the roadway from large plants growing close to the side of the road that can force drivers to move to the center of the road • Maintain adequate road drainage (vegetation can clog ditches and drains) • Keep pavement intact as long as possible <ul style="list-style-type: none"> ○ Plants next to pavement or growing into cracks in pavement can allow water to move down under the asphalt causing it to buckle and crack more. ○ Weeds growing along the shoulder can hasten the deterioration of the shoulder which can lead to hazardous roadside conditions, especially for bicycles, but also for cars if the drop from the road surface becomes large. <p><u>To reduce liability for the County:</u> Fires, accidents, and law suits against the County are a regular and costly occurrence.</p> <p><u>To prevent the movement of invasive plants along roadway corridors:</u> Invasive plant seeds and parts can be carried far and wide by animals, wind, and water moving along roadsides. Even vehicle tires and undercarriages, bicycle tires, and people's footwear can move weeds from one place to another.</p>
Who has jurisdiction over the areas in question?	<p>The County owns the roads and rights-of-way and is responsible for their maintenance. The local fire districts are responsible for insuring that property owners and managers follow their regulations.</p> <p>Note: In general in unincorporated areas where there are curbs, gutters, and sidewalks, the homeowner is responsible for vegetation management.</p>
Number of road miles under management	<p>The total number of road miles is 660 (a road mile includes both sides of the road).</p> <p>Approximately 325 to 375 road miles are under active vegetation management (the number changes with the weather and other factors from year to year). Not all of the 660 road miles are rural roads, many are in unincorporated residential areas where the Public Works Department does not manage roadside vegetation).</p>
Number of staff available for vegetation management activities	<p>Currently the Division has 3 trained vegetation management techs.</p> <p>Full staffing would be 1 supervisor and 6 vegetation management personnel.</p> <p>The maintenance division would be fully staffed at 86, however, currently there are only 57 positions filled. These 57 employees perform all of the road maintenance tasks, such as paving, crack sealing, pavement marking, ditch and drainage maintenance, signage, tree trimming and removal, storm damage emergency response and repair, guard rail maintenance and flood control maintenance. The small vegetation management crew is part of the 57 employees and is responsible not only for roadsides, but also for flood control channels and unimproved County properties.</p>
Source of funding	<p>Road maintenance, including vegetation management, is funded solely from the gasoline tax. The County does not contribute any money from the General Fund except for a small amount going to specific drainage projects.</p> <p>The funds coming from the gas tax had been declining for years because the tax had not been increased, while at the same time cars have become much more fuel efficient. In addition there are many electric vehicles on the road that pay no gas tax for maintenance of the roads on which they drive.</p> <p>With the passage of California Senate Bill 1 in December 2016, the County will see a much needed increase in funds for road maintenance; however, the extra funds must first go to bring the average Pavement Condition Index up to 80 or better. At present, CCC's arterial Pavement Condition Index</p>

	<p>is in the 60s.</p> <p>The following are the main provisions of SB 1:</p> <ul style="list-style-type: none"> • \$0.12 increase in gasoline tax/gallon, with inflation adjustment • Increase to the Vehicle License Fee of between \$25 and \$175, with inflation adjustment, depending on the cost of the vehicle • \$0.20 increase in the tax/gallon on diesel • An increase in vehicle registration fee for 2020 and later model zero-emission vehicles of \$100 with inflation adjustment f • The bill would impose various requirements on the department and agencies receiving these funds. The bill would authorize a city or county to spend its apportionment of funds under the program on transportation priorities other than those allowable pursuant to the program if the city's or county's average Pavement Condition Index meets or exceeds 80. 	
How often is the site monitored?	<p>All sites in the county are monitored every few days. The Vegetation Manager spends part of every day inspecting roadways on a rotating basis. The road crews, the road crew supervisors, and the vegetation management crew are all trained to recognize vegetation issues on roadsides and road rights-of-way and to report them to the Vegetation Manager. Monitoring information is recorded on the Vegetation Manager's Daily Report.</p> <p>If a new weed species is found, the Vegetation Manager identifies and researches the weed. If he/she cannot identify the specimen, he/she consults the County Department of Agriculture. If a weed on the California Department of Food and Agriculture A-rated list is found, the County Agriculture Department is also consulted.</p>	
Weeds have been identified as the following:	<p>Any species that can pose a fire danger or sight obstruction, including volunteer trees and otherwise desirable species, will be managed to maintain the integrity of the road and road shoulder.</p> <p>Key weeds are listed below. The list is continually updated as vegetation changes.</p> <p>Invasive species:</p> <ul style="list-style-type: none"> • Yellow starthistle (<i>Centaurea solstitialis</i>) • Purple starthistle (<i>Centaurea calcitrapa</i>) • Russian thistle, or tumbleweed (<i>Salsola tragus</i>) • Kochia (<i>Kochia scoparia</i>) • Stinkwort (<i>Dittrichia graveolens</i>) • French broom (<i>Genista monspessulana</i>) • Pepperweed (<i>Lepidium latifolium</i>) • Tree of heaven (<i>Ailanthus altissima</i>) • Algerian ivy (<i>Hedera algeriensis</i>) • Himalayan blackberry (<i>Rubus armeniacus</i>) <p>Other species:</p> <ul style="list-style-type: none"> • Poison oak (<i>Toxicodendron diversilobum</i>) • Poison hemlock (<i>Conium maculatum</i>) • Mare's tail (<i>Conyza canadensis</i>) • Mustard (<i>Brassica</i> spp.) • Mallow or cheeseweed (<i>Malva</i> spp.) • Various grasses <p>The Department does not have a specific invasive weed management program; however, the vegetation management crew is trained to look for invasives when they are out working.</p>	
Are populations high enough to require control?	<p>The Vegetation Management crew manages vegetation as necessary to meet the management goals above.</p> <p>At times vegetation re-growth may be sparse enough and the fire risk low enough that a decision might be made to leave the re-growth alone.</p>	
Are these sensitive sites?	Are any areas "highly sensitive sites" as defined by PWD Environmental staff?	No

	Are any areas under the Routine Maintenance Agreement with Fish and Game?	It's possible if a road shoulder is under the riparian canopy.
	Are any areas part of any of the court-ordered injunction? (see: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay) Some areas are included in the red legged frog injunction. The Department has a map of areas included in the red legged frog injunction.	Yes
	Are any areas known or potential habitat for any endangered or threatened species? Some areas border habitat or potential habitat for species, but the actual gravel road shoulder is not suitable habitat for most vertebrates.	No
	Are these areas places where people walk or children play? Most of the roads and rights-of-way covered by this document are not suitable for pedestrian traffic or for children to play. Areas where people walk are the following: <ul style="list-style-type: none"> • Iron Horse Trail • Clyde Pedestrian Path • Delta De Anza Trail (county only maintains a small portion) 	Occasionally
	Are they near a drinking water reservoir?	Yes, some
	Are they near crops?	Yes, in some cases.
	Are they near desirable trees or landscaping?	Yes, occasionally
	Is the soil highly permeable, sandy, or gravelly? Yes, in some areas. Hoffman Road is one.	Yes
	Is the ground water near the surface?	Unknown, other than Hoffman Road
What factors are taken into account when determining the management technique(s) for vegetation?	<ul style="list-style-type: none"> • Species of plant • Stage of growth • Plant density • Plant location • Road condition—if a road is in very poor condition, vegetation growing close to the edge can cause more damage than if a road is in good condition. Every 7 to 10 years, the road is scheduled for resurfacing and there must be a clear corridor for the work. 	
Are special permits required for work?	If the Department were to use Vanquish (dicamba), which is restricted because of volatility, it would need to file with the County Department of Agriculture a Notice of Intent (NOI) to apply the material.	
Which cultural controls were considered?	Mulching <ul style="list-style-type: none"> • It is difficult to contain mulch on the side of the road. There is a danger that it could clog drainage ditches and drains, run off into waterways, present road hazards to bicyclists. • Wood chip mulch is combustible and would only add to the fire danger. • The cost of buying and/or spreading mulch along roadsides would be prohibitive and very dangerous for the crew. Weed Barriers <ul style="list-style-type: none"> • Rubber mats can be used around guard rails, but are very expensive. Weeds can grow up 	

	<p>through the joints in the mats and on top of the mats in accumulated soil and organic matter. Rubber mats are combustible, and the resulting fire releases noxious fumes.</p> <ul style="list-style-type: none"> • Fabric barriers are expensive and very costly to install, hard to anchor to the ground, and vehicles can tear them, rendering them ineffective. • Weed seeds can germinate in the organic matter that accumulates on the weed barrier or is intentionally placed there. <p>Planting Desirable Species</p> <ul style="list-style-type: none"> • This has been used in some limited circumstances in Yolo County, but the plants must still be mowed. • Establishment takes time, money, water, and attention. • The plants must conform to very limiting specifications so as not to be sight hazards, fire hazards, etc. They could not be planted adjacent to the road. <p>CONCLUIONS:</p> <p>Mulching and weed barriers are problematic on roadsides. The Department has not found any areas where these would be appropriate.</p> <p>Planting desirable species is not used at this time because the Department must maintain a vegetation-free zone next to the road.</p>
<p>Which physical controls were considered?</p>	<p>Pruning: This is used on large vegetation where needed to meet management goals.</p> <p>Mowing by machine: Mowing is used on French broom to reduce the amount of vegetation before herbicide applications. Mowing is also used for blackberries and for willows in place of, or before, herbicide treatment. Mowing on the Iron Horse Trail is contracted out.</p> <p>Machine mowing is not used more extensively because of the following:</p> <ul style="list-style-type: none"> • Terrain is a limiting factor. Many of the County's rural roads have unimproved shoulders that are very uneven and have trees growing on them. This makes mowing very difficult. • Mowing may not meet fire regulations in many areas. • Mowing usually requires more than one pass per treatment which increases cost. Depending on the terrain, it may take several passes per treatment to mow down the vegetation. • With mowing there is always the risk of starting a fire when mower blades create sparks from striking rocks or other obstacles. This is a regular occurrence with both machine and hand mowing. • Recent changes in safety regulations for mowing have increased costs and the number of staff needed for each mower. This may have the effect of further limiting the work window. • Mowing can also transport invasive plant seeds and parts from one area to another. • There is a narrow window of time when mowing is most effective for meeting fire regulation deadlines. This is the same window of time in which flood control channels must be mowed. If mowing is done too early, the vegetation can grow back and require mowing a second or even third time to meet fire regulations. The Department does not have enough crew and equipment to complete all work by mowing in that space of time • It is more costly than herbicide treatment. See Table 1 below. • The County's Climate Action Plan requires a reduction in greenhouse gas emissions, and increasing mowing would substantially increase those emissions. <p>Mowing by hand: This has limited use on roadsides, but it can be useful around guard rails.</p> <ul style="list-style-type: none"> • Mowing by hand (weed whacking) can be particularly dangerous for employees: <ul style="list-style-type: none"> ◦ Traffic presents serious hazards. ◦ Workers can sustain injuries from slipping on steep or rocky terrain. ◦ Workers can sustain injuries from debris being thrown up and onto workers: rocks, glass, barbed wire, pieces of metal and pieces of mower blades. • Hand mowing is even more costly than machine mowing. • There is always a risk of starting a fire. <p>Grazing</p> <ul style="list-style-type: none"> • Logistics and safety on the side of a narrow country road are very difficult. The liability to the County is high.

	<ul style="list-style-type: none"> • Grazing animals can distract motorists, which can be a danger to both the animals and motorists. The animals temporarily remove the emergency parking available on the shoulder. • Grazing is costly for this application, especially because grazing a narrow strip necessitates moving the animals frequently, which is expensive. (See Table 1.) <p>Burning: Besides being dangerous, this technique could not be used on roadsides because the Bay Area Air Quality Control Board would not allow it.</p> <p>Concrete under guard rails or cement treated base for road shoulders: These treatments are long lasting, but very expensive. (Need cost range) Currently the County is not installing any new guard rails or shoulders.</p> <p>It is quite difficult to make repairs to concrete slabs if they crack or erode. Once cracks form, weed seeds can sprout in the cracks. Repairing concrete or cement-treated base used on the road shoulder is also very difficult, especially if damage occurs at the edge from erosion. Everything must be torn out and replaced.</p> <p>CONCLUSIONS: Pruning and machine mowing are used by the Department where they are appropriate. At this time, the other techniques are too dangerous, too costly, or not practical.</p>
Which biological controls were considered?	Biological controls are not applicable in this situation unless a particular invasive weed is the target, and it has an available biological control.
Which chemical controls were considered?	<p>During many years of research, experience, and experimentation, including consulting the literature, researchers, and colleagues about materials that are labeled for, and effective on, weeds in rights-of-way, the Division has chosen the herbicide options listed below. The Department continues to consult researchers and colleagues, as well as new literature, to identify new choices that may be more effective, more environmentally friendly, and of lesser human toxicity.</p> <p>Note that the Weed Science Society of America (WSSA) and the Herbicide Resistance Action Committee (HRAC) both create resistance group designations to help weed managers reduce the likelihood of creating resistant weeds. Every 2 to 3 seasons, the Division rotates herbicide active ingredients according to the resistance group designations from WSSA to limit the buildup of herbicide resistant weeds along the roadsides.</p> <p>Possible herbicide choices (These product names are subject to change.)</p> <p>When the IPM process calls for the use of herbicides, the products below are used where most suitable considering cost, efficacy, the environment, human communities, and resistance management.</p> <p><u>Pre-emergent Herbicides</u></p> <p>Esplanade, Gallery, and Resolute are pre-emergent herbicides that are used in the buffer zone next to the road to maintain bare ground. They each belong to a different resistance management group and are used in rotation to prevent herbicide resistance. The Division uses pre-emergent herbicides to reduce the amount of post-emergent herbicides that are needed.</p> <p>Indaziflam (Esplanade®): This pre-emergent herbicide controls a broad spectrum of weeds if applied before germination. It does not generally control weeds after they have emerged. For maximum weed control, the herbicide needs to reach the soil surface and be activated by rainfall or adequate soil moisture. It is applied in the fall to control winter germinating weeds and in the spring to control spring germinating weeds.</p> <p>Signal Word: CAUTION Rate: 3 to 5 oz/acre Timing: Before weeds sprout in either fall or spring near the time rain is expected. Cost to apply (includes material cost): \$125/acre</p>

Herbicide Resistance Management Group: 29

Isoxaben (Gallery® S.C.): This pre-emergent controls certain broadleaf weeds.

Signal Word: CAUTION

Rate: 20 to 30 oz/acre

Timing: Before weeds sprout in either fall or spring near the time rain is expected.

Cost to apply (includes material cost): \$210/acre

Herbicide Resistance Management Group: 21

Prodiamine (Resolute® 65 WDG): This pre-emergent herbicide controls grass and broadleaf weeds by preventing the growth and development of newly germinated weed seeds. Weed control is most effective when the product is activated by at least ½" of rainfall or irrigation, or shallow (1" to 2") incorporation before weed seeds germinate and within 14 days following application.

Signal Word: CAUTION

Rate: 1 to 2 lbs/acre

Timing: Before fall weeds or spring weeds germinate, and close to the time rain is expected.

Cost to apply (includes material cost): \$97/acre

Herbicide Resistance Management Group: 3

Post emergent (contact) herbicides

Glyphosate (Roundup® Pro Concentrate): Glyphosate is a systemic herbicide (is absorbed into the plant and circulates to kill the entire plant) that will kill most types of vegetation—grass, broadleaf, vines, brush, etc. **Roundup is used as a contact herbicide for emerged grasses on road shoulders.**

Signal Word: CAUTION

Rate for spot spraying on roadsides using a boom mounted on a truck: 2 pts in 20 gal of water/acre

Rate for spot spraying by pulling hose with a handgun attached: 6 pts in 100 gal of water/acre

This method is used mostly for parcels where a crew must walk rather than drive.

Timing: Varies depending on the location, the weather, the weed growth, the work load

Cost to apply (includes material cost):

- \$135/acre for Roundup application from a boom mounted on a truck
- \$673/acre for Roundup application from a hose with a handgun

Herbicide Resistance Management Group: 9

**Enjoined for red legged frog

Triclopyr TEA (Garlon® 3A): Garlon 3A is specific for woody plants and broadleaf weeds (but not grasses) and is used for spot treatments. It is usually tank mixed with Roundup.

Signal Word: DANGER (for eye damage to mixer/loader and applicator)

Rate for spot spraying on roadsides using a boom mounted on a truck: 2 to 4 pts in 20 gal of water/acre

Rate for spot spraying by pulling hose with a handgun attached: 4 to 6 pts in 100 gal of water/acre

This method is used mostly for parcels where a crew must walk rather than drive.

Timing: Varies depending on the location, the weather, the weed growth, the work load

Cost to apply (includes material cost):

- \$146/acre for Garlon 3A application from a boom mounted on a truck
- \$714/acre for Garlon 3A application from a hose with a handgun

Herbicide Resistance Management Group: 4

**Enjoined for red legged frog

Herbicides with both Pre- and Post-Emergent Activity

Chlorsulfuron (Telar® XP): Telar XP is both a pre-emergent and post-emergent herbicide for the control of many invasive and noxious broadleaf weeds. Warm, moist conditions following application enhance the effectiveness of Telar XP since moisture carries the herbicide into weed roots and prevents them from developing. Weeds hardened off by drought stress are less susceptible to this

	<p>herbicide. Telar is used primarily for control of difficult broadleaf weeds such as pepperweed.</p> <p>Signal Word: CAUTION Rate: 1.6 oz/acre Timing: Before fall weeds or spring weeds germinate and close to the time rain is expected. Cost to apply (includes material cost): \$113/acre Herbicide Resistance Management Group: 2</p> <p>Dicamba diglycolamine salt (Vanquish®): Vanquish is registered for selective broadleaf and brush control and has both pre- and post-emergent qualities. Dicamba is a systemic herbicide that acts as a plant growth regulator. Dicamba is a federally restricted material due to the potential for harm to non-target plants. It can volatilize when temperatures are high. A special permit must be obtained from County Ag, and the applicator must notify County Ag in advance of the application. If the application is cancelled, County Ag must be notified. Vanquish is used selectively as a spot treatment for difficult to control broadleaf weeds.</p> <p>Signal Word: CAUTION Rate: 1 to 2 pts/acre Timing: Best when weeds are small Cost to apply (includes material cost): \$95/acre Herbicide Resistance Management Group: 4 Not on any injunction list</p> <p>Aminopyralid (Milestone®): Milestone is a systemic herbicide with both pre- and post-emergent properties that controls broadleaf weeds without affecting grasses. Milestone is used for the more woody and thick-stemmed weeds on road shoulders.</p> <p>Signal Word: CAUTION Rate: 5 to 7 oz/acre Timing: Between fall and spring before seeds germinate, but it is a more flexible chemical because it also has contact properties Cost to apply (includes material cost): \$96/acre Herbicide Resistance Management Group: 4 Not on any injunction list</p> <p>Sulfometuron methyl (Oust XP®): This pre-emergent and early post-emergent herbicide controls many annual and perennial grasses and broadleaf weeds. The Department rarely uses this on roadsides.</p> <p>Signal Word: CAUTION Rate: 3.6 to 4.8 oz/acre Timing: Before or just after weeds germinate in the fall or spring. Cost to apply (includes material cost): \$95/acre Herbicide Resistance Management Group: 2</p>
Which herbicide application methods are available for these chemicals?	<p>The Department's current equipment allows for 3 methods of application:</p> <ul style="list-style-type: none"> • broadcast application or spot treatment from a boom attached to a truck • spot treatment from a handgun attached to a hose connected to a truck-mounted tank • and spot treatment with a backpack. <p>CONCLUSIONS: The terrain, proximity to water, potential human or non-target exposure, kind of weed species, and goal of the treatment dictate the application method.</p>
What weather concerns must be checked prior to application?	<p>The Vegetation Manager takes into consideration the pesticide label and all site specific factors. Each day, the Vegetation Manager checks the weather when he/she arrives at work at 6:00 AM. Rain can prevent application of some herbicides because of the danger of runoff. For most pre-emergent herbicides, rain is needed after application in order for the herbicide to be effective. The Vegetation Manager must also consider wind speed (generally it should be <7 mph) and possible temperature inversions to avoid herbicide drift. Crews measure and record weather factors prior to and during application. Excessive heat or cold makes plants shut down, and herbicide applications</p>

	at that time could be ineffective. The Vegetation Manager uses these factors to write Pest Control recommendations for the crew to follow on the days that spraying takes place.
Cost Comparisons for various mgmt methods on both roadsides and flood control channels	See Table 1, below.
Recommendations from the IPM Advisory Committee	<ul style="list-style-type: none"> Continue to review all vegetation management methods available for flood control channels and access roads considering efficacy, cost, impacts to the environment, and to the human community. Encourage investigation into, and experimentation with, new methods. Review this document every 3 years.

Table 1. Methods, Acres Treated, and Cost* for Vegetation Management along Contra Costa Roadsides and Flood Control Channels, Averaged over Two Years (2014-2016)[§]

Vegetation Management Method	Acres Treated	% of Total Acres Treated	Total Cost for all acres treated	Cost/ Acre	% of Total Cost for all acres treated	% Change in Total Acres Treated from FY 12-13
Chemical Treatment - Roads	1157	55%	\$180,145	\$156	22%	-36%
Right of Way Mowing (mainly flood control channels)	280	13%	\$278,133	\$993	34%	+8%
Chemical Treatment - Creek Access Roads	152	7%	\$46,728	\$307	6%	+33%
Chemical Treatment - Creek Banks	70	3%	\$28,657	\$409	4%	-59%
Grazing (flood control facilities)	375	18%	\$191,301	\$510	24%	+74%
Chemical Treatment - Aquatic Applications	66	3%	\$46,125	\$699	6%	+11%
Mulching (flood control fence-lines and access road shoulders)	10	0.5%	\$36,923	\$3692	4%	+43%
Totals	2110		\$808,012			-20%

*Table lists the most accurate costs available and is not necessarily specific to roadsides.

[§]Table is updated each year in the IPM Annual Report. See cchealth.org/ipm.

Contra Costa County

DRAFT DECISION DOCUMENTATION for VEGETATION MANAGEMENT

on Flood Control Channels

Date: October 2, 2017

Department: Public Works Roadside and Flood Control Channel Vegetation Management Div.

Location: Flood Control Channels

Situation: Vegetation management along 76 miles of flood control channels and creek banks; this includes areas ranging from unimproved natural creeks to concrete-lined channels, along with levies that are certified by the Army Corps of Engineers

Note that management decisions are site specific for flood control channels. Not every management technique will work equally well at all sites and the costs of each technique will vary depending on the site.

<p>What are the management goals for the site?</p>	<p>To maintain vegetation along flood control channels and creek banks so that</p> <ul style="list-style-type: none"> • erosion of the banks does not occur • vegetation does not impede the flow of water in a flood • vegetation does not collect silt and debris that could obstruct the passage of water • vegetation does not hide problems on banks such as ground squirrel burrows, erosion, beaver activity, etc. • vegetation does not pose a fire hazard • vegetation remains a mix of small herbaceous plants and grasses • homeless encampments cannot flourish unnoticed • waterways do not become a conduit for the spread of noxious weeds throughout the county • waterways provide habitat for wildlife • maintenance is performed in accordance with the Routine Maintenance Agreement (RMA) with the state Department of Fish and Wildlife • maintenance is performed in accordance with the regulations from the Army Corps of Engineers and the Regional Water Quality Control Boards (San Francisco and San Joaquin) <p>Vegetation is also managed along flood control access roads to maintain the integrity of the roads and ease of access for equipment.</p>
<p>How often is the site monitored?</p>	<p>All sites in the county are monitored every few days to every few weeks. The Vegetation Manager spends part of every day inspecting waterways on a rotating basis. The road crews, the flood control supervisors, and the vegetation management crew are all trained to recognize vegetation issues on flood control channels and creeks and to report them to the Vegetation Manager. Monitoring information is recorded on the Vegetation Manager's Daily Report.</p> <p>If a new weed species is found, the Vegetation Manager identifies and researches the weed. If he/she cannot identify the specimen, he/she consults the County Department of Agriculture. If a weed on the California Department of Food and Agriculture A-rated list is found, the County Agriculture Department is also consulted.</p>
<p>Weeds have been identified as the</p>	<p>Various grasses, including</p> <ul style="list-style-type: none"> • Harding grass (<i>Phalaris aquatica</i>)

<p>following:</p> <p>Note that this is not a comprehensive list, but a list of the main problem plants.</p>	<ul style="list-style-type: none"> • Johnsongrass (<i>Sorghum halepense</i>) • Reed canarygrass (<i>Phalaris arundinacea</i>) • Wild oats (<i>Avena fatua</i>) • Quack grass (<i>Elymus repens</i>) <p>Various broadleaf weeds including</p> <ul style="list-style-type: none"> • Mustard (<i>Brassica</i> spp.) • Cocklebur (<i>Xanthium</i> sp.) • Poison hemlock (<i>Conium maculatum</i>) • Wild carrot (<i>Daucus carota</i>) • Stinging nettle (<i>Urtica</i> sp.) • Himalayan blackberry (<i>Rubus armeniacus</i>) <p>Invasive weeds such as</p> <ul style="list-style-type: none"> • Perennial pepperweed (<i>Lepidium latifolium</i>) • Purple loosestrife (<i>Lythrum salicaria</i>) • Red sesbania (<i>Sesbania punicea</i>) <p>On some engineered channels, cattails (<i>Typha</i> sp.) and trees (willow—<i>Salix</i>, walnut—<i>Juglans</i>, ash—<i>Fraxinus</i>) are considered weeds.</p> <p>The Maintenance Division's vegetation management crew is trained to look for invasives when they are out working and report them to the Vegetation Manager who consults with the Agriculture Department about what action to take.</p>	
<p>Are populations high enough to require control?</p>	<p>The Vegetation Management crew manages vegetation as necessary to meet the goals above.</p>	
<p>Is this a sensitive site?</p>	<p>Is this a “highly sensitive site” as defined by PWD Environmental staff? A highly sensitive site contains a known habitat for, or is close to sightings of, endangered or threatened species. Refer to the attached flow chart for how sensitive sites are determined and handled.</p> <p>Some sites fit in this category.</p>	<p>Yes</p>
	<p>Is this under the Routine Maintenance Agreement with Fish and Game?</p> <p>All creeks are covered under the Routine Maintenance Agreement.</p>	<p>Yes</p>
	<p>Is this part of any of the court-ordered injunction? (see: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay)</p> <p>Some areas are included in one or more injunctions.</p>	<p>Yes</p>
	<p>Is this a known or potential habitat for any endangered or threatened species?</p> <p>Yes, some sites contain habitat for various sensitive species including salmonids, red legged frog, various nesting birds, dusky footed woodrat, salt marsh harvest mouse. Each site is reviewed by a biological monitor (a trained Public Works staff member) or a Certified Biologist.</p>	<p>Yes</p>
	<p>Is it on or near an area where people walk or children play?</p> <p>The Division does not manage pests on established (paved) trails. These trails are mainly under the management of East Bay Regional Park District. In cases where established trails exist along flood control</p>	<p>No</p>

	channels (areas of Walnut Creek, Marsh Creek, and Wildcat Creek) they are situated above the creek slopes. Access roads along flood control channels are County property and are posted "No Trespassing." The public should not be on the access roads and enter at their own risk. In general, the public is not allowed access to the slopes or waterway within these environments.	
	Is it near a drinking water reservoir? None of the flood control channels that the Division maintains is near a reservoir.	No
	Is it near crops? There are areas of Marsh Creek, Sand Creek, and Dry Creek that are near crops.	Yes
	Is it near desirable trees or landscaping? There are some flood control access roads that are near residences.	Yes
	Is the soil highly permeable, sandy, or gravelly? Yes, in some areas.	Yes
Which cultural controls were considered?	<p>Mulching: Woodchips are used on flood control access roads where appropriate to prevent and suppress weeds. Creek banks cannot be mulched.</p> <p>Weed Barrier/Sheet Mulching: This cannot be used on the creek banks, and for the access roads, it would be an added and unnecessary expense since a deep cover of woodchips serves the same purpose.</p> <p>Planting Desirable Species: The County Flood Control District is partnering with The Restoration Trust, an Oakland-based non-profit organization promoting habitat restoration and stewardship, in a native planting experiment along Clayton Valley Drain (near Hwy 4 adjacent to Walnut Creek). The study is examining the survival of several California natives: Santa Barbara sedge, (<i>Carex barbarae</i>), common rush (<i>Juncus effusus</i>), Baltic rush (<i>Juncus balticus</i>), field sedge (<i>Carex praegracilis</i>), and creeping wild rye (<i>Leymus triticoides</i>).</p> <p>The original planting occurred in December 2013, and in December 2014 volunteers focused on supplemental planting in the same location to replace drought damaged plants. Santa Barbara sedge, common rush, Baltic rush, and field sedge were planted on the lower terrace near the creek and the creeping wild rye was planted on the slopes of the channel.</p> <p>These species spread from underground rhizomes and will anchor the soil to provide erosion control. They are all perennial species that stay green year around and are resistant to fire. The plants are compatible with flood control objectives since they do not have woody stems, and during flood events, they lie down on the slope, thereby reducing flow impedance. They are not sensitive to broadleaf-specific herbicides, and unlike non-native annuals, they provide carbon sequestration and remove as much as ½ ton of carbon per acre per year. Native grasses and sedges can potentially out-compete non-native broadleaf weeds and annual grasses, but they do require maintenance assistance from herbicides.</p> <p>The Division, at the request of The Restoration Trust, spot treats the area with broadleaf herbicides to reduce competition and provide the native plants with an advantage. The Division also provides hand and mechanical mowing, as requested.</p> <p>The Restoration Trust will monitor these plots until 2018 to assess native plant survival, the degree to which they compete with the non-native annual species, and the relative success of seeding</p>	

	<p>versus planting plugs.</p> <p>CONCLUSIONS: Mulching can be and is used along flood control access roads where the mulch will not drift into the creek. The Public Works Department is experimenting with planting desirable species to out-compete weedy species. This is an IPM technique the Public Works Department is interested in exploring further. However, establishment of desired species takes time, money, water, and attention and may require continued use of herbicide to prevent invasion of undesirable species.</p>
Which physical controls were considered?	<p>Pruning: Trees are pruned for equipment clearance and for line of sight along access roads. Trees that sprout in engineered channels on the slopes or in creek channels are cut down in order to comply with Army Corps of Engineers regulations. The top of the stump is generally painted with an herbicide to ensure control.</p> <p>Mowing by machine: Many creek slopes are mowed by tractor for fire prevention, as required by the Fire District. The channels are mowed along the top of the slope and a minimum of 6 ft. down the side of the slope. Mowing works best on open spaces without a lot of trees.</p> <p>Mowing by hand: Areas that are not mowed by machine or grazed by animals are usually mowed by a crew with weed whackers.</p> <p>Grazing: Grazing is used where the presence of endangered species, such as the red legged frog, make it difficult to mow, for example, on Pine Creek Dam. Grazing is also used in areas such as Pine Creek and Ygnacio Valley Drain where the creek sides are steep and dangerous for human workers. Goats are more expensive than hand mowing but their use can help avoid incurring indirect costs such as staff injuries. See Table 1 for more information on costs.</p> <p>For detailed information on how grazing is used in the County, see the decision document for weed management entitled Using Grazing Animals for Weed Abatement.</p> <p>Burning: This technique was used in the past but is no longer because the Bay Area Air Quality Control Board allows burning only in very limited circumstances.</p> <p>Electrothermal weeding (Ubiquetek): This method uses a probe carrying electricity at a high voltage (3, 000 to 5,000 to volts) and low amperage (0.5 to 2 amps) to heat plant tissue and kill both roots and above ground plant material. The probe must contact each individual weed. This method is more efficient than steaming or flaming weeds, but would be very slow compared to mowing by machine or hand. Such high voltage is lethal, so the device is potentially extremely dangerous to the operator. This method also poses a fire risk because of the intense heat at the point of contact with the plant that can produce sparks and small flames. Currently there have been no independent evaluations of this method. For these reasons the Department does not consider this a viable tactic at this time.</p> <p>Steam weeding (Weedtechnics): This method works by sending water under pressure through a diesel boiler and then out through hoses to an application head. The water comes out at 205 to 218 degrees Fahrenheit. This method is also extremely slow. The applicator must drive around 2 mph to treat effectively. Because of the speed of application and the small water tank, an applicator could only treat 5 to 7 miles before having to refill the tank. This method only penetrates the soil about ¼” so it does not kill underground portions of plants and therefore must be repeated every 3 to 4 weeks. For these reasons the Department does not consider this a viable tactic at this time.</p> <p>CONCLUSIONS: Each of these techniques, except burning and electrothermal and steam weeding, is used by the Department where appropriate.</p>
Which biological controls were considered?	<p>Biological controls are not applicable in this situation unless a particular invasive weed is the target, and it has a biological control available.</p>

<p>Which chemical controls were considered?</p>	<p>During many years of research, experience, and experimentation, including consulting the literature, researchers, and colleagues about materials that are labeled for, and effective on, weeds in rights-of-way, the Division has chosen the herbicide options listed below. The Department continues to consult researchers and colleagues, as well as new literature, to identify new choices that may be more effective or more environmentally friendly.</p>
<p>Attach PCA recommendation</p>	<p>Note that the Weed Science Society of America (WSSA) and the Herbicide Resistance Action Committee (HRAC) both create resistance group designations to help weed managers reduce the likelihood of creating resistant weeds. The designations below are from WSSA. Herbicide resistance groups are rotated every 2 to 3 seasons to limit the buildup of herbicide resistant weeds along the roadsides.</p> <p>Possible herbicide choices:</p> <p>Pre-emergent Herbicides</p> <p>Esplanade, Oust XP, and Resolute 65 WDG are pre-emergent herbicides that are used only on flood control access roads to prevent weed emergence. They each belong to a different resistance management group and are used in rotation to prevent creating herbicide-resistant weeds. The Department uses pre-emergent herbicides to reduce the amount of post-emergent herbicides that are needed. In some areas, it is very difficult to mow either by hand or by machine, and grazing would be too costly. Those areas are treated with herbicide.</p> <p>Indaziflam (Esplanade®): This pre-emergent herbicide controls a broad spectrum of weeds if applied before germination. It does not generally control weeds after they have emerged. For maximum weed control, the herbicide needs to reach the soil surface and be activated by rainfall or adequate soil moisture. It is applied in the fall to control winter germinating weeds and in the spring to control spring germinating weeds.</p> <p>Signal Word: CAUTION Rate: 3 to 5 oz/acre Timing: Before weeds sprout in either fall or spring near the time rain is expected. Cost to apply (includes material cost): \$125/acre Herbicide Resistance Management Group: 29</p> <p>Sulfometuron methyl (Oust XP®): This pre-emergent and early post-emergent herbicide controls many annual and perennial grasses and broadleaf weeds. The Department uses it to control grasses on flood control access roads.</p> <p>Signal Word: CAUTION Rate: 3.6 to 4.8 oz/acre Timing: Before or just after weeds germinate in the fall or spring. Cost to apply: Need current figures Herbicide Resistance Management Group: 2</p> <p>Prodiamine (Resolute® 65 WDG): This pre-emergent herbicide controls grass and broadleaf weeds by preventing the growth and development of newly germinated weed seeds. Weed control is most effective when the product is activated by at least ½" of rainfall or irrigation, or shallow (1" to 2") incorporation before weed seeds germinate and within 14 days following application.</p> <p>Signal Word: CAUTION Rate: 1 to 2 lbs/acre Timing: Before fall weeds or spring weeds germinate, and close to the time rain is expected. Cost to apply (includes material cost): \$97/acre Herbicide Resistance Management Group: 3</p> <p>Post emergent (contact) herbicides</p> <p>Glyphosate, which is not a selective herbicide, is used at a regular rate in areas where it is not necessary to maintain a cover of grasses. Glyphosate, at a much reduced rate, is used to</p>

chemically “mow”, or stunt, vegetation on creek banks where feasible.

Garlon 3A and Renovate3 are specific for broadleaf weeds and are used where the Department wants to keep a grassy cover on the creek slopes. Renovate is used to control cattail growth in areas not subject to the injunctions. Either might be used as a cut stump treatment.

Clearcast is used for spot treating cattails in flood control channels.

Glyphosate (Roundup® Pro Concentrate & Roundup Custom®): Glyphosate is a systemic herbicide (is absorbed into the plant and circulates to kill the entire plant) that will kill almost any type of vegetation—grass, broadleaf, vines, brush, etc. Roundup is used on creek slopes for many different weeds. Roundup Custom is used at a much reduced rate for chemical “mowing” on creek slopes to stunt vegetation but not kill it. Roundup Custom is registered for use in water so the Department uses that formulation if applications are going to be very near water.

Signal Word: CAUTION

Rate for spot spraying on access roads using a boom mounted on a truck: 2 pts in 20 gal of water/acre

Rate for spot spraying by pulling hose with a handgun attached: 6 pts in 100 gal of water/acre

This method is used mostly where a crew must walk rather than drive.

Rate for chemical mowing: 1/5 pt in 10 gal of water/acre

Timing: Varies depending on the location, the weather, the weed growth, the work load

Costs to apply (includes material cost):

- \$135/acre for Roundup application from a boom mounted on a truck
- \$673/acre for Roundup application from a hose with a handgun
- Need current cost/acre for Roundup Custom used for chemical mowing

Herbicide Resistance Management Group: 9

**Enjoined for red legged frog

Triclopyr TEA (Garlon® 3A and Renovate® 3): Triclopyr controls woody plants and broadleaf weeds, but not grasses. Renovate is registered for use within or adjacent to aquatic sites.

Signal Word: DANGER (for eye damage to mixer/loader and applicator)

Garlon 3A or Renovate on access roads using a boom mounted on a truck: 2 pts in 20 gal of water/acre

Rate for use of Garlon 3A or Renovate pulling hose with a handgun attached: 4 pts in 100 gal of water/acre

Rate for cut stump treatment: Undiluted material

Timing: Varies depending on the location, the weather, the weed growth, the work load

Cost to apply (includes material cost):

- \$146/acre for Garlon 3A application from a boom mounted on a truck
- \$714/acre for Garlon 3A application from a hose with a handgun
- Need current cost/acre for Renovate application from a boom mounted on a truck
- Need current cost/acre for Renovate application from a hose with a handgun

Herbicide Resistance Management Group: 4

**Enjoined for red legged frog

Imazamox (Clearcast®): Imazamox is a post-emergent, slow acting, systemic herbicide for use in and around aquatic and non-cropland sites. **Currently, it is only used for treating cattails with a hose and handgun.**

Signal Word: CAUTION

Rate for spot spraying cattails with a hose and handgun:

Timing:

Cost to apply (includes material cost):

Herbicide Resistance Group: 2

Herbicides with both Pre- and Post-Emergent Activity

Chlorsulfuron (Telar® XP): Telar XP is both a pre-emergent and post-emergent herbicide for the

	<p>control of many invasive and noxious broadleaf weeds. Warm, moist conditions following application enhance the effectiveness of Telar XP since moisture carries the herbicide into weed roots and prevents them from developing. Weeds hardened off by drought stress are less susceptible to this herbicide. This herbicide is used by the Department mainly for control of perennial pepperweed.</p> <p>Signal Word: CAUTION Rate: 1.6 oz./acre Timing: Before fall weeds or spring weeds germinate and close to the time rain is expected. Cost to apply (includes material cost): \$113/acre Herbicide Resistance Management Group: 2</p> <p>Imazapyr (Habitat®): Habitat is registered for the control of undesirable vegetation in and around standing or flowing water, and can be used for wetland, riparian, and terrestrial vegetation growing in or around surface water when treatment might inadvertently result in application to surface water. Habitat has both pre- and post-emergent activity and is a systemic herbicide (is absorbed into the plant and circulates to kill the entire plant) that controls grass and broadleaf weeds, brush, vines, etc. It will not control vegetation submerged in water.</p> <p>Habitat is used only as a spot treatment for <i>Arundo</i>, pampas grass, ivy growing on fences and in creeks, and as a cut stump treatment for feral trees (the tree is cut down and the herbicide is immediately applied to the cut stump).</p> <p>Signal Word: CAUTION Rate: 8 oz./3 gal of water in a backpack for spot treatments and for cut stumps Timing: Timing: Varies depending on the location, the weather, the weed growth, the work load Cost to apply (includes material cost): Need current cost/acre Herbicide Resistance Management Group: 2 **Enjoined for red legged frog</p> <p>CONCLUSIONS: All of the above herbicides are used where most suitable and are rotated among the different resistance management groups in order to prevent creating herbicide-resistant weeds.</p>
Which herbicide application methods are available for this chemical?	<p>Methods available: Current equipment allows for 4 methods of application: a boom attached to a truck, a handgun attached to a hose connected to a truck-mounted tank, spot treatment with a backpack, and spot treatment with a squirt bottle.</p> <p>The truck with a boom is used wherever possible since it is most efficient. A handgun attached to a hose is used where access is difficult for a truck, the backpack sprayer is used for small spot treatments, and the squirt bottle is used for cut stump treatments.</p> <p>CONCLUSIONS: The terrain, the proximity to the water, the kind of weed, and the goal of the treatment dictate the application method.</p>
What weather concerns must be checked prior to application?	<p>The Vegetation Manager takes into consideration the pesticide label and all site specific factors. Each day, the Vegetation Manager checks the weather when he/she arrives at work at 6:00 AM. Rain can prevent application of some herbicides because of the danger of runoff. For most pre-emergent herbicides, rain is needed after application for the herbicide to be effective. The Vegetation Manager must also consider wind speed (generally it should be <7 mph) to avoid herbicide drift. Crews carry wind meters in their trucks. Excessive heat or cold makes plants shut down, and herbicide applications then would be ineffective. The Vegetation Manager uses these factors to write Pest Control recommendations for the crew to follow when spraying takes place.</p>
Cost Comparisons for various management	<p>See Table 1, below.</p>

methods	
Changes in management methods since the previous iteration of this document	<p>Since FY 12-13, changes are as follows:</p> <ul style="list-style-type: none"> • Increased acres mowed on flood control channels by 8% • Reduced acres treated with chemicals on flood control channels by 59% • Increased acres grazed by goats by 74% • Increased acres of aquatic chemical treatments by 11% • Increased acres of access road shoulder and fenceline treatments by 33%
Recommendations from the IPM Advisory Committee	<ul style="list-style-type: none"> • Continue to review all vegetation management methods available for flood control channels and access roads considering efficacy, cost, impacts to the environment, and to the human community. • Encourage investigation into, and experimentation with, new methods. • Review this document every 3 years.

Table 1. Methods, Acres Treated, and Cost* for Vegetation Management along Contra Costa Roadside and Flood Control Channels, Averaged over Two Years (2014-2016)[§]

Vegetation Management Method	Acres Treated	% of Total Acres Treated	Total Cost for all acres treated	Cost/ Acre	% of Total Cost for all acres treated	% Change in Total Acres Treated from FY 12-13
Chemical Treatment - Roads	1157	55%	\$180,145	\$156	22%	-36%
Right of Way Mowing (mainly flood control channels)	280	13%	\$278,133	\$993	34%	+8%
Chemical Treatment – Flood Control Access Roads	152	7%	\$46,728	\$307	6%	+33%
Chemical Treatment – Flood Control Banks	70	3%	\$28,657	\$409	4%	-59%
Grazing (flood control facilities)	375	18%	\$191,301	\$510	24%	+74%
Chemical Treatment - Aquatic Applications	66	3%	\$46,125	\$699	6%	+11%
Mulching (flood control fence-lines and access road shoulders)	10	0.5%	\$36,923	\$3692	4%	+43%
Totals	2110		\$808,012			-20%

*Table lists the most accurate costs available.

[§]Table is updated each year in the IPM Annual Report. See cchealth.org/ipm.

Attachment B.

- Report from the IPM Outreach Subcommittee to the Contra Costa County IPM Advisory Committee
- Pests and Rental Housing in California: *Know your rights and responsibilities!*
- Script for Pest Management Awareness for In-home Visitors PowerPoint Presentation

Report from the IPM Outreach Subcommittee to the Contra Costa County IPM Advisory Committee

Prepared by Tanya Drlik, IPM Coordinator, November, 2017

Members

Jim Cartan
Susan Heckly
Michael Kent – Chair
Andrew Sutherland

To date, the IPM Outreach subcommittee has met five times in 2017: February 14, April 25, May 30, July 6, August 17, and October 11.

At their first meeting, after electing Michael Kent as chair, the subcommittee decided to work with the County's most vulnerable populations through outreach to in-home visitors with the goals of

- Informing County staff of the public health risks of having pests in the home.
- Helping staff to recognize pest problems in their clients' homes.
- Making staff aware of the resources available for their clients.

The subcommittee invited various County programs to a meeting to explain the subcommittee's ideas about the outreach program and to obtain feedback from the program representatives. The following programs either attended the meeting or were contacted by the Chair:

- Senior Nutrition Program (Meals on Wheels)
- Adult Protective Services
- WIC
- In Home Support Services
- Head Start
- Behavioral Health in-home nurses
- Public Health nurses

The response from program representatives was positive, and the subcommittee began work on a PowerPoint presentation with the aim of giving presentations to County staff starting in fall 2017.

The subcommittee gathered pest management resources and created a fact sheet to clarify tenant and landlord responsibilities regarding pest management. (See attached.)

The subcommittee reviewed and revised the presentation and gave a sample presentation to the entire IPM Advisory Committee at its September 2017 meeting to gain additional feedback. The subcommittee has encouraged all members of the Outreach subcommittee to consider giving the presentation to one of the target organizations.

The final script for the presentation is attached.

The Chair and the IPM Coordinator will devise a schedule of presentations for the fall and winter.

Pests and Rental Housing in California

Know your rights and responsibilities!

Pests such as rodents, cockroaches, bed bugs, and ants can cause serious problems in your home and may threaten your health and well-being. Make sure you know your rights and responsibilities as a tenant of rental housing in California. Remember that you must work together with your landlord to solve problems and improve conditions in your community.

- **You have a right to safe and healthy housing.** Your landlord must make sure your unit is fit to live in ('habitable') when you move in (CA Civil Code Section 1941). They must also repair any problems that make your unit unfit to live in while you are there (CA Civil Code Section 1941). This includes pest and mold (CA Senate Bill 655) problems! Landlords must also fix problems that are contributing to pest problems (CA Senate Bill 1167), such as water leaks, gaps around doors and windows that provide pest access, and holes and crevices that provide places for pests to hide.
- **You must notify your landlord when you have pest problems.** Your landlord needs to know when you have issues with pests. Let them know as soon as possible when you observe rodents, cockroaches, or other pests in your unit. For bed bugs, this notification is your legal responsibility, especially if your building includes five or more units (CA Assembly Bill 551).
- **You are responsible for pest prevention in your unit.** You must take reasonable care of your unit (CA Civil Code Sections 1941 and 1942). This means that you must keep things clean and tidy in your home. Proper sanitation will prevent pests like cockroaches and ants from becoming problems.
- **You have a right to know about pest management in your unit.** Your landlord must inform you in advance when they plan to enter your unit for pest management (CA Civil Code Section 1954). They must also inform you of pesticide applications that will take place in your unit (CA Civil Code Section 1940). These notices should be written, providing at least 24 hours' notice. If mailed to your home, these notices may require up to six days' notice.
- **You have the right to seek help if your landlord will not manage pests in your home.**
 - Contact Code Enforcement in the jurisdiction of your residence.

Help for tenants regarding legal aspects can be found by going to:

- Contra Costa Bar Association (<http://www.cccba.org/>)
- www.lawhelpcalifornia.org
- Tenants Together (<http://www.tenantsaltogether.org/>) or other tenants' rights organizations
- Echo Housing provides help to some residents of CCC (<http://www.echofairhousing.org/tenantlandlord-services.html>)

(Note for subcomm: add an East CCC resource)

To learn more about your rights as a tenant in California, please review the Department of Consumer Affairs guide *California Tenants*: <http://www.dca.ca.gov/publications/landlordbook/catenant.pdf>

Script for Pest Management Awareness for In-home Visitors PowerPoint Presentation

Slide 1

Hi, I'm _____ from the County's Integrated Pest Management Committee. The County is dedicated to using a least hazardous approach to managing pests. I'm here because we think home visitors can learn about this approach to help your clients.

Ideas for props: Climbups, snap traps-Victor and T-Rex, cockroach bait stations, roach motels, mattress encasement, food storage container-plastic and glass

Slide 2: What we'll cover today

READ text on slide out loud:

What we'll cover today:

- Common pest problems and some solutions
- Opportunities for you to help your clients
- Resources for helping your clients)

You can decide how you want to use the resources and what you are comfortable with in helping your clients.

Slide 3: Why care about pests in the home?

So, why should we care about pests in the home?

Pests can damage our health, our buildings, and our food. Insects, rodents, molds, and microbes can all be considered pests.

Slide 4: Asthma triggers

Asthma is the health problem most commonly impacted by the home environment.

When we think about asthma triggers we usually think of pet dander, pollen, cigarette smoke and mold, but did you know that pests can be asthma triggers too?

Slide 5: Asthma triggers from pests

Dust mite skins, feces, and secretions are the most common allergenic component in house dust. Cockroach droppings and scales, as well as mouse urine, have been shown to contain potent allergens. If we can reduce these asthma triggers, we can have healthier living spaces.

Slide 6: Pests create other hazards in the home

Pests create other hazards in the home.

Rodents can carry *Salmonella* in their gut, and when they contaminate food in the home, there is a risk of food poisoning.

There are mites that ride around on rats and are capable of biting people, especially if the rat makes a nest in the home and then abandons it.

Rats can and do bite people, and of course bed bugs bite people.

A serious problem with rodents is that they often gnaw on electrical wires and cause fires or electrical shorts.

Slide 7: Other problems with pests

There are still other problems with pests in the home.

Rodents eat our food but they contaminate much more food than they eat.

Rodents do a lot of gnawing which damages personal belongings and structures.

This is a couch we found in a Richmond motel where mice had chewed holes under the cushions to make a home.

This is a picture of a hole that rats gnawed in the wall to get from their nest in the wall out into the home to get food.

Slide 8: Other problems with pests

You may have had grain moths or beetles in your kitchen and had to throw away the food.

And maybe you've had carpet beetles or clothes moths ruin belongings.

Slide 9: Bed bugs can cause:

There has been a resurgence of bed bugs throughout the U.S. You will be encountering them more and more often.

Having bed bugs can make it very hard for people to sleep.

Bed bugs can make people really anxious and may cause depression and other psychological problems.

We have seen people spraying pesticides on their baby's crib mattress and on their children's clothes.

We've seen people setting off numerous bug bombs at once in their homes. These pesticides don't help and are hazardous to everyone's health.

Slide 10: What happens when there is a lack of pest control services?

What we have seen is that poor or nonexistent pest control services can drive residents to take matters into their own hands by applying store-bought pesticides.

Many people think that since a little pesticide is good, a lot must be better! This can be hazardous to people's health.

Slide 11: What can you do to help?

Perhaps the best way for you to detect pest problems is to listen to your clients.

Sometimes your clients may not be aware that they have pest problems.

You can share resources and information about pests and pest management from CC County and the Univ. of CA.

Your clients will learn that you have information and connections and will share pest info with you.

In this way you can help create a healthier environment for them.

Slide 12: Signs of rats & mice

Pests often leave distinctive evidence that says they've been around.

You may see some of these signs and be able to help your client even though they don't know they need help.

Here you can see mice and rat droppings compared to rice grains.

Slide 13: Signs of bed bugs

With bed bugs, you might see blood stains, live bugs, or fecal spots.

If you see bites, it could warrant further investigation.

But understand that no one can tell what caused a bite.

It is not possible to tell a mosquito or flea bite from a bed bug bite, no matter what a doctor might tell you.

Slide 14: Signs of cockroaches

With cockroaches, you might see live bugs or their droppings in places they hang out, like in cupboards or under the sink.

Slide 15: Pest Prevention

Preventing pests is the most effective way to control them. It's more work, but prevention is a long-lasting solution.

Prevention has many benefits.
READ text on slide out loud.

Slide 16: Prevention—Understand what all pests need

To prevent pests, we need to understand what they need. Pests need access to a dwelling to cause problems, and their other needs are the same as for humans: food, water, & shelter.

Pests get in through holes and cracks, they come in on food from the grocery store, and we may bring them in on our personal belongings.

Visitors can bring in pests, and pests can move from one apartment to another through the walls and under doors.

Once inside, pests need the same things we do: food, water and shelter.

If we can reduce the access or curtail the availability of food, water, or shelter, we can make a big difference.

Slide 17: Deny access to the structure

Pests can get in through small holes, gaps, or cracks. We can reduce pest access by filling holes, putting doorsweeps at the bottom of doors, and putting screens on windows.

A door sweep is fastened to the bottom of a door to close the gap between the door and the floor.

Inspect items you bring into the house for pests like cockroaches or bed bugs.

Slide 18: Store food properly

Food should be stored properly: in the refrigerator, in plastic containers with tight-fitting lids, in glass jars.

Slide 19: Keep things clean

It's important to keep things clean. Spilled food or drinks and crumbs provide plenty of food for pests.

Slide 20: Wash sheets at least every 2 weeks

Sheets should be washed at least every 2 weeks and dried on "high".

READ bullet text on slide.

Slide 21: Remove food garbage

If cockroaches or ants are the problem, seal up food garbage overnight.

Night time is when cockroaches come out to feed, and night is when ants can discover leftover food when you're not around to clean up.

Be sure to remove garbage frequently and put in the outside trash can.

Slide 22: Remove food garbage

Mice and rats can chew through a garbage bag, so if they are the problem, remove food garbage every day before you go to bed.

Don't leave garbage outside of your trash cans, and make sure to close the lid.

You don't want to be feeding rodents at your garbage cans.

Slide 23: Water

Excess water in the home increases the humidity. This is an ideal environment for cockroaches, dust mites, and mold. Wet, decaying wood is very attractive to termites.

- Fix leaking pipes
- Open the window or turn on the fan when showering.

If the fan isn't working, it should be fixed.

Slide 24: Shelter

READ text on slide.

Then:

It also collects mouse urine & dust.

Slide 25: A team approach is necessary to solve pest problems.

A team is necessary to solve pest problems.

Pests like rodents, bed bugs, and cockroaches can make their way through the walls of an apartment building, so controlling them requires cooperation among tenants, landlords and pest management professionals.

Slide 26: Cooperative Roles in Pest Management

Everybody has a role in pest management.

These are the tenant's responsibilities.

READ bullet text on slide.

Slide 27: Cooperative Roles--Landlords

Landlords have responsibilities too. Some of them are written into law.

READ bullet text on slide.

Slide 28: Cooperative Roles—Landlords, cont.

(READ text on slide.)

Slide 29: Cooperative Roles—Pest Mgmt Professionals

READ 1st bullet.

Conducive conditions are things like holes around pipes, excessive moisture, or poor sanitation that encourage pests to take up residence.

READ remaining text on slide.

Slide 30: Benefits of Using Pest Management Professionals

And there are benefits to using professional.

READ bullet text on slide.

We recommend using professionals, but we do have tips for your clients that can help them if they own their home or if their landlord won't do anything to help them.

Slide 31: Special Tips for Bed Bugs

A clothes dryer will kill all stages of bed bugs: items that are dry should be tumbled for 15 minutes on high; wet items should be dried first and then tumbled an extra 15 minutes on high to make sure bugs are dead.

The Climbup Interceptor is a plastic dish that is rough on the outside, but very smooth and slippery on the inside. Bed bugs wander in to Climbup Interceptors -- there is no attractant or pesticide needed. Once they are in, they can't climb out.

You can place 3 or 4 in each room and check them after about 2 weeks to see if the apartment has bed bugs.

You can place them under the legs of a bed that has been thoroughly cleaned to protect the bed.

Climbup Interceptors are available from Amazon or can be ordered from Home Depot.

(Show audience examples of Climbups.)

Slide 32: Special Tips for Cockroaches

READ text on slide.

Slide 33: Special Tips for Rodents

READ text on slide.

Slide 34: Special Tips for Ants

READ text on slide.

So, are you noticing a pattern here? Don't leave food out, clean up, and take out the garbage!

Slide 35: Questions?

I'm going to pass out our resource sheet.

I'm happy to answer any questions, and you're welcome to come up and look at the products.

Attachment C.

- **Pesticide Use Reporting**

(See separate PDF for Contra Costa Operations Pesticide Use Data Spreadsheet)

Pesticide Use Reporting

(See separate PDF for Contra Costa County Operations Pesticide Use Data Spreadsheet)

History of Pesticide Use Reporting

Since the 1950s, the State of California has required at least some kind of pesticide use reporting, but in 1990, the comprehensive reporting program we have now went into effect.

California was the first state in the nation to require full reporting of all agricultural and governmental agency pesticide use. The current reporting system exempts home use pesticides and sanitizers, such as bleach, from reporting requirements. (Sanitizers are considered pesticides.)

What does “pesticide” mean?

The California Department of Pesticide Regulation (DPR) defines pesticide as “any substance or mixture of substances intended for preventing, destroying, repelling or mitigating insects, rodents, nematodes, fungi, weeds, or other pests. In California plant growth regulators, defoliants, and desiccants, as well as adjuvants, are also regulated as pesticides.”

“Adjuvants” increase pesticide efficacy and include emulsifiers, spreaders, foam suppressants, wetting agents, and other efficacy enhancers. In FY 16-17, Contra Costa County operations used a total of 4,709 lbs. of pesticide active ingredients, which included 2,322 lbs. of spray adjuvant active ingredients that were used to prevent foaming, to reduce pesticide drift, and change the pH of local water used in spraying.

How Pesticide Use is Reported to the State

Pesticide use data is reported monthly to the County Agriculture Commissioner. The data is checked and sent on to DPR, which maintains a database of pesticide use for the entire state. Although pesticide use is reported to DPR as pounds, ounces, or gallons of pesticide product, DPR reports pesticide use in its database as pounds of active ingredient.

DPR defines active ingredient as “[a]n agent in a product primarily responsible for the intended pesticidal effects and which is shown as an active ingredient on a pesticide label.” (Since adjuvants are regulated as pesticides in California, the active ingredients of adjuvants are also included in DPR’s database.)

How Pesticide Use is Reported by Contra Costa County Operations

The attached spreadsheet records pesticide use data only for County operations and not for any other agency, entity, company, or individual in the County.

Since DPR reports California pesticide use in pounds of active ingredient, Contra Costa County does the same. The County uses the same formula for converting gallons of pesticide product into pounds of active ingredient that the state uses:

Pounds of Active Ingredient =

gallons of product used X 8.33 lbs/gallon of water X the specific gravity of the product X the % of active ingredient in the product