Contra Costa County
DECISION DOCUMENTATION for RAT MANAGEMENT AT LIVORNA PARK

Date: 8/4/2016

Department: Special Districts

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

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

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

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

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

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