

Central Valley Regional Water Quality Control Board

PYRETHROID MANAGEMENT PLAN
FOR THE RECEIVING WATERS OF
THE CITY OF SHASTA LAKE



AUGUST 2021

PREPARED FOR:

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

&

CITY OF SHASTA LAKE

4477 MAIN STREET

SHASTA LAKE, CA 96019

PREPARED BY:

PACE ENGINEERING, INC.

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Jeff Tedder

City Engineer, City of Shasta Lake


_____ Date 10-11-21

Table of Contents

Project Information.....	3
Background	3
Management Plan Overview	3
Management Plan Practices	5
Education and Outreach Activities.....	5
Pesticide Pollution Prevention Activities	5
Support of Pollution Prevention Through Participation in the Pesticide Regulatory Process.....	6
References	6
Appendices.....	6
Appendix A: Public Outreach Literature	6
Appendix B: Integrated Pest Management Plan.....	6
Appendix C: City of Shasta Lake Commercial Pesticide Applicators	6

Project Information

PYRETHROID MANAGEMENT PLAN FOR THE RECEIVING WATERS OF THE CITY OF SHASTA LAKE

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Background

In 2017, the Central Valley Regional Water Quality Control Board (CVRWQCB) passed Resolution R5-2017-0057, which established a Pyrethroid Pesticides Control Program (Basin Plan Amendment) to control the discharging of pyrethroid pesticides throughout the Sacramento and San Joaquin River Basins to protect aquatic life beneficial uses.

The discharges to waters of the United States from Municipal Separate Storm Sewer Systems (MS4s) have been found by the CVRWQCB to be a source of pyrethroid pesticides to surface waters within the Sacramento and San Joaquin River Basins. Resolution R5-2017-0057 established a conditional prohibition for the discharges of pyrethroid pesticides to waters with aquatic life beneficial uses in the Sacramento and San Joaquin River Basins, established monitoring requirements for MS4s to conduct baseline monitoring, and specified that the Executive Officer may issue 13267 and/or 13383 orders to meet these monitoring requirements. The City of Shasta Lake (City) is a permitted MS4 discharger within the geographic scope of the pyrethroids control program and received an order on July 13, 2020 (Order), for compliance with 13267 and/or 13383. All dischargers were given the option of conducting baseline monitoring to determine pyrethroid contamination levels or accepting previously conducted testing performed elsewhere throughout the state and establishing a management plan to control pyrethroid pesticide use within their jurisdiction.

The City notified the CVRWQCB of the City's intent to acknowledge that the existing data is representative of their discharge and submit a Pyrethroids Management Plan to CVRWQCB by August 19, 2021.

Management Plan Overview

Per the Order, the City will implement policies in three areas with the goal of effectively reducing pyrethroid pesticide levels in their discharges. The pyrethroid chemicals that have been found by the CVRWQCB to be at toxic levels to aquatic species include the following:

1. Bifenthrin
2. Cyfluthrin
3. Cypermethrin
4. Esfenvalerate
5. Lambda-cyhalothrin
6. Permethrin

The Order includes activities within these three areas for consideration in this management plan. Following are the suggested activities:

1. Education and Outreach Activities:
 - a. Undertake targeted outreach programs to encourage communities within a Discharger's jurisdiction to reduce their reliance on pesticides that threaten water quality; focusing efforts on those most likely to use pesticides that threaten water quality, potentially by working with California Department of Pesticide Regulation (CDPR), County Agricultural Commissioners, and the University of California Statewide Integrated Pest Management (UC-IPM) Program, or other entities as appropriate.
 - b. Make available point-of-purchase outreach materials to pesticide retailer(s) in or near the Discharger's jurisdiction. These materials shall provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control.
 - c. Conduct outreach to Discharger's residents and businesses who may hire structural pest control and landscape professionals that contain messages that 1) explain the links between pesticide usage and water quality; and 2) provide information about structural pest control Integrated Pest Management (IPM) certification programs and IPM for landscape professionals.
 - d. Encourage public and private management practices (e.g., landscape design, irrigation management, etc.) that minimize pesticide runoff.
2. Pesticide Pollution Prevention Activities:
 - a. Reduce reliance on pyrethroids and other pesticides that threaten water quality by adopting and implementing policies or procedures that minimize the use of pesticides that threaten water quality in the Discharger's operations and on the Discharger's property.
 - b. Develop and implement an IPM policy that:
 - i. Is consistent with IPM as defined by the University of UC-IPM Program or the California Structural Pest Control Board definition.
 - ii. Applies to all Discharger staff who conduct or contract for pest management and to pest management vendors under contract to the Discharger.
 - iii. Assigns responsibilities to a designated staff position and/or department to coordinate Discharger activities and ensure that the IPM policy is implemented.
3. Support of Pollution Prevention Through Participation in the Pesticide Regulatory Process:
 - a. Track USEPA and CDPR pesticide evaluation and registration activities as they relate to surface water quality, and encourage these agencies to accommodate urban water quality concerns within their pesticide registration processes. This may include assembling and submitting available information (such as monitoring data) to USEPA and CDPR during public comment periods to assist in their pesticide evaluation and registration activities. This management practice would be implemented most effectively through a cooperative regional or statewide approach.

Management Plan Practices

Each of the practices from the Order have been evaluated by City staff. Following are the proposed practices that will bring the City into compliance with the Order:

Education and Outreach Activities

The City will implement the following outreach activities:

1. The City will make a new webpage its website and informational literature will be available for residents and businesses within its jurisdiction. The webpage will include information about the Boards findings, including the harmful effects of pyrethroid pesticides and possible alternative prevention activities or pesticides. See example documents in Appendix A.
2. The City will also make available on the webpage literature for local pesticide retail stores that include information on proper pesticide use, disposal, and potential adverse effects on water quality. Alternative practices will also be listed. See example documents in Appendix A.
3. The City will conduct outreach with businesses and community members via a notification in one of their monthly water bills and posts to the City's social media pages. The notifications and social media posts will direct residents and businesses to the City's webpage. Providing informational literature on a website and social media is a greener, less paper intensive alternative for conducting outreach than distributing paper pamphlets to residents and businesses.
4. The City will encourage retailers to subscribe to the Retail Nursery & Garden Center IPM Newsletter via the webpage.
5. The City will coordinate with local pest control services for pest management services and staff training as needed.

Pesticide Pollution Prevention Activities

The City will reduce use of those pyrethroid pesticides that contain the toxic chemicals by instituting the IPM along with the following policies:

1. The City will no longer purchase pesticides that contain the listed pyrethroid chemicals.
2. The City will stipulate in future contracts with commercial vendors that pyrethroid pesticide use on City-owned property will only be allowed in limited circumstances, at those locations with low potential for runoff to receiving waters.
3. The City will assign oversight of the IPM to the IPM Coordinator within the Public Works Department. This position will be responsible for ensuring that IPM policy is implemented, and that records of compliance is properly documented.
4. Stormwater runoff is one of the main methods in which pesticides are transported to receiving waters. The City will encourage stormwater Best Management Practices (BMP'S) that reduce stormwater runoff such as landscape buffers and infiltration BMP's.

The IPM was established based on UC Davis's IPM, which is consistent with UC-IPM policies. The IPM for management of pyrethroid pesticides can be found in Appendix B.

Support of Pollution Prevention Through Participation in the Pesticide Regulatory Process

The City will participate in the regulatory process through the following activities:

1. City staff will enroll in the email notification list for the USEPA, California Structural Pest Control Board (CSPCB), CDPR, and California Stormwater Quality Association (CASQA).
2. City staff will enroll in the UC IPM Green Bulletin. Subscription can be found at <https://ucanr.edu/survey/survey.cfm?surveynumber=13531>.
3. City staff will attend public teleconference meetings conducted by CSPCB, which occur approximately every 4 months. City staff will provide input where necessary. CSPCB meeting schedule can be found at <https://pestboard.ca.gov/about/meetings.shtml>.
4. City staff will attend public teleconference meetings conducted by the USEPA Pesticide Program Dialog Committee. City staff will provide input where necessary. Meeting information can be found at <https://www.epa.gov/pesticide-advisory-committees-and-regulatory-partners/pesticide-program-dialogue-committee-ppdc>.
5. City will coordinate integrated pest control policy with Shasta County, City of Redding, and City of Anderson. City staff currently attend multi-agency meetings with the above jurisdictions to establish regional approaches to MS4 policy compliance. The City will adopt/revise policies to continue a feasible regional approach to IPM policy.

References

1. California Regional Water Quality Control Board, Central Valley Region, 2020. Order to Submit Technical and Monitoring Reports Pursuant to California Water Code Sections 13267 and 13383, July 13, 2020. Central Valley Regional Water Quality Control Board. Sacramento, CA.
2. California Regional Water Quality Control Board, Central Valley Region, 2014. Amendment to The Water Quality Control Plan For The Sacramento River And San Joaquin River Basins For The Control Of Diazinon And Chlorpyrifos Discharges, March 28, 2014. Central Valley Regional Water Quality Control Board. Sacramento, CA.
3. California Regional Water Quality Control Board, Central Valley Region, 2020. Central Valley TMDL Projects, Pyrethroid Pesticides TMDL and Basin Plan Amendment, homepage website: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/central_valley_pesticides/pyrethroid_tmdl_bpa/index.html.
4. University of California Agriculture and Natural Resources, UC Statewide Integrated Pest Management, 2021. Publications and Other Educational materials, Green Bulletins, Retail Nursery and Garden Center IPM News.
5. University of California Davis Facilities IPM Plan.

Appendices

[Appendix A: Public Outreach Literature](#)

[Appendix B: Integrated Pest Management Plan](#)

[Appendix C: City of Shasta Lake Commercial Pesticide Applicators](#)

APPENDIX A

Public Outreach Literature



WELCOME/MAIN MESSAGE

Pyrethroid Pesticide Use Within the City of Shasta Lake

In 2017, the Central Valley Regional Water Quality Control Board (CVRWQCB) passed Resolution R5-2017-0057, establishing a Pyrethroid Pesticide Control Program to control the discharging of pyrethroid pesticides throughout the Sacramento and San Joaquin River Basins to protect aquatic life. Pyrethroids are a class of synthetic insecticides found in household pesticides sold in common retail locations and are approved for use by the California Department of Pesticide Regulation. Pyrethroids remain in the environment significantly longer than naturally derived pyrethrin, which means they are susceptible to being transported by surface runoff into surrounding aquatic environments. A recent report has found that pyrethroid concentrations in urban storm drain discharges frequently exceeded water quality standards, and these elevated concentrations were determined to be toxic to aquatic life.

In response to these new findings, the City of Shasta Lake (City) is implementing a Pyrethroid Management Plan to reduce pyrethroid levels in the City's runoff. Pyrethroid-based pesticides can still be used and sold within city limits, but the City is encouraging everyone to reduce their use and businesses to reduce their sales of pyrethroid-based products. The City, in cooperation with the State Water Boards, has provided information and links below about clean waterways, what is Integrated Pest Management (IPM), and alternatives to chemical pest controls. The health of aquatic species in our creeks, streams, and rivers is an important component to recreation in the area as well as biodiversity of the waterways.

RESIDENTIAL

As a resident, you can contribute to clean waterways by:

1. Clicking here: <http://ipm.ucanr.edu/PDF/QT/qtkeepourwaterclean.pdf> to learn some basics about keeping our water clean.
2. Using alternative, naturally derived pesticides such as pyrethrin or Safer soap. Follow this link: <http://ipm.ucanr.edu/PDF/QT/qtlesstoxicinsecticides.pdf> to learn about less-toxic pest control methods.
3. Using integrated pest management (IPM) practices, such as predatory insects, around your home and garden. Click here: <http://ipm.ucanr.edu/PDF/QT/qtwhatisipm.pdf> for information on IPM practices.
4. Reducing pesticide applications and avoid using them during the rainy season.
5. Utilizing landscape management practices, such as buffers and infiltration, to reduce the potential for pesticides applied to the ground from washing off your property.
6. Reducing runoff from your property through irrigation management to prevent dry-weather stormwater runoff.
7. Working with a licensed pest control company that can evaluate your pest problem and provide targeted solutions.

BUSINESSES

As a local business, you can contribute to clean waterways by:

1. Using or selling alternative, naturally derived pesticides such as pyrethrin or Safer soap. Follow this link: <http://ipm.ucanr.edu/PDF/QT/qtlesstoxicinsecticides.pdf> to learn about less-toxic pest control methods.
2. Posting educational material in your store about integrated pest management (IPM) and non-toxic methods of pest control. Download, view, and print information for the following topics:
 - Keep Our Water Clean: <http://ipm.ucanr.edu/PDF/QT/qtkeepourwaterclean.pdf>
 - What is IPM?: <http://ipm.ucanr.edu/PDF/QT/qtwhatisipm.pdf>
 - Natural Enemies of Garden Pests poster:
http://ipm.ucanr.edu/IPMPROJECT/ADS/poster_naturalenemies.html
3. Selling your remaining stock of pyrethroid-based pesticides and then switch to selling non-pyrethroid-based products.
4. Signing up here: <https://ucanr.edu/survey/survey.cfm?surveynumber=11686> to receive the Retail Nursery and Garden Center IPM News from University of California IPM, which provides helpful tips and new information about pest management.
5. Working with a licensed pest control company that can evaluate your pest problem and provide targeted solutions for your retail location.

PEST CONTROL COMPANIES

As a pest control company, you are a primary pesticide user and your actions can have a large impact on water quality. You can contribute to the clean water effort by:

1. Using or selling alternative, naturally derived pesticides such as pyrethrin or Safer soap. Follow this link: <http://ipm.ucanr.edu/PDF/QT/qtlesstoxicinsecticides.pdf> to learn about less-toxic pest control methods.
2. Working with your clients on integrated pest management (IPM) practices, such as predatory insects, that reduce or eliminate the need for toxic pesticides. Click here: <http://ipm.ucanr.edu/PDF/QT/qtwhatisipm.pdf> for information on IPM practices.
3. Using your remaining pyrethroid-based products and then switching to non-pyrethroid-based products.
4. Staying connected by subscribing to the free University of California IPM Green Bulletin, <https://ucanr.edu/survey/survey.cfm?surveynumber=13531>, which focuses on specific practices and information that pest management professionals can incorporate into their daily work to manage pests effectively while reducing pesticide runoff.
5. Renewing or ensuring your license is current and valid with the California Department of Pesticide Regulation (CDPR). Follow this link for licensing information and status: <https://www.cdpr.ca.gov/docs/license/liccert.htm>.

You also have the unique opportunity to discuss IPM with your clients and the importance of responsible pesticide use.

BOTTOM OF PAGE MESSAGE

For more information and resources on pesticide use, management, and landscaping, click on the following links which provide comprehensive information and techniques to keep your space pest free and waters clean:

- University of California Agriculture & Natural Resources – This site contains newsletters, training events, free publications, pest identification, and many more resources: <http://ipm.ucanr.edu/>.
- UC IPM Landscape and Garden Resources – Contains information about specific pest and mitigation strategies, natural enemies, water quality guide, healthy garden tips, and much more: <http://ipm.ucanr.edu/IPMPROJECT/landscaperesources.html>.
- California Department of Pesticide Regulation – Contains news and publications, pesticide safety information, and a list of pest control providers with a valid California license: <https://www.cdpr.ca.gov/index.htm>.

Meet the Beneficials:

Natural Enemies of Garden Pests

Predators hunt, attack, and kill their prey. Encourage these natural enemies by avoiding pesticides that kill them; choosing plants that provide them pollen, nectar, and shelter; and keeping ants out of pest infested plants. Common predators that eat garden pests are pictured below.



Convergent lady beetles prefer to eat aphids but sometimes eat whiteflies and other soft-bodied insects. Shown here are the adult (left), larva (center), and cluster of eggs (right).



Green lacewing adults eat nectar and pollen. Some species also eat insects.



Green lacewing larvae feed on mites, eggs, and small insects, especially aphids.



Green lacewing eggs are laid on slender stalks in groups (as shown here) or individually.



Predaceous ground beetle adults stalk soil-dwelling insects, such as cutworms and root maggots.



Predaceous ground beetle larvae live on soil and in litter, feeding on almost any invertebrate.



Assassin bugs attack almost any insect.



Pirate bugs attack mites and any tiny insect, especially thrips.



Damsel bugs are predaceous on a wide variety of small insects.



Soldier beetle adults eat mostly aphids; their larvae are soil-dwelling.



Spiders, including this crab spider, attack all types of insects.



Syrphid fly (flower fly, hover fly) adults eat pollen and nectar.



Syrphid fly larvae eat mostly aphids but also soft-bodied insects.



Sixspotted thrips attack mostly mites.



Western predatory mites attack pest mites.



Adults of predatory wasps, such as this paper wasp, prey on caterpillars and other insects.



Praying mantids don't control pests, because they eat both beneficials and pests.

Parasites live and feed in or on a larger animal (host). Nearly all insect pests have at least one parasite that attacks them. Insects that parasitize other invertebrates (sometimes called parasitoids) are parasitic only in their immature stages and kill their host just as they reach maturity. Most insect parasites are host-specific wasps or flies, and many are so small that often you won't see them. An adult parasite can lay eggs in hundreds of host individuals with a resulting quick reduction in pest numbers.



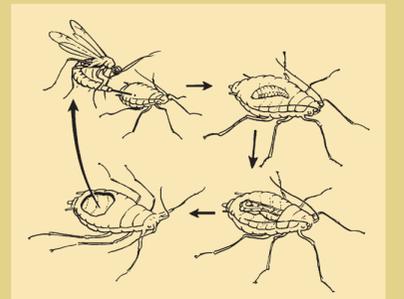
Some parasites attack insect eggs, such as the *Trissolcus* species wasp.



Parasitized aphids die and turn into crusty "mummies" that can be black or beige. The hole in the mummy at left indicates a parasite has emerged. The aphid in the middle is healthy.



The blackish scale insects have wasp larvae developing within.



Aphid parasite life cycle: The adult lays an egg in an aphid. The egg hatches into a larva that feeds inside. After killing the aphid, the wasp larva pupates then emerges as a wasp.



Caterpillar parasites include the *Hyposoter exiguae* wasp.

PHOTOS: J. K. CLARK

Visit the Natural Enemies Gallery at www.ipm.ucdavis.edu for more information!



University of California Agriculture and Natural Resources
Statewide Integrated Pest Management Program

Keep Our Water Clean

Home and garden pesticides and fertilizers are polluting California's waterways. Problems occur when people pour garden chemicals down drains or when chemical residues wash into gutters, storm drains, and streams by rain, garden watering, or cleaning up with the garden hose. Garden chemicals not only threaten aquatic life; they can also affect the quality of our drinking water. Follow these tips to keep our rivers, creeks, and oceans clean.

What can you do to protect water quality?

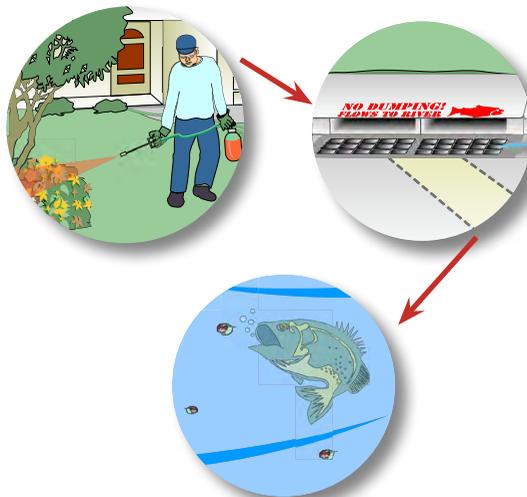
- ◆ **Limit pesticide use** by using nonchemical methods or least-toxic pesticides wherever possible. Ask a UC Master Gardener for help with pest problems.
- ◆ **Avoid using pyrethroid insecticides.** These products, which include bifenthrin, cypermethrin, and permethrin, are among the most toxic to aquatic animals.
- ◆ **Control ants** by reducing food sources, excluding them from homes, and using baits in containers, instead of spraying. Don't use insecticides for lawn insects unless you are sure insects are causing the damage.
- ◆ **Cut back on fertilizer,** more is not better. Actively growing turf, flowering shrubs, and some annuals and fruit trees require regular feeding but ornamental trees don't. Use a mulching mower to recycle lawn clippings and reduce fertilizer applications.
- ◆ **Use slow-release fertilizers,** including composted organic fertilizers, which are less likely to move into water. Be sure to measure and apply them according to label directions.
- ◆ **Don't let fertilizer or pesticides get onto hard surfaces** such as sidewalks or driveways. Sweep any material that accidentally lands on hard surfaces back onto the lawn.
- ◆ **Dispose of garden chemicals correctly.** Never sweep, hose off, or pour leftover pesticides or fertilizers into drains or gutters. Dispose of unused products at your local household hazardous waste site.

Call 1-800-CLEANUP
(1-800-253-2687)
for a disposal site near you!



Reduce runoff by making your landscape water efficient.

- ◆ **Reduce your landscape's need for water** by choosing water-efficient plants and garden designs.
- ◆ **Minimize runoff by using mulches** in beds and permeable materials for walkways and driveways. Aerate and add organic matter such as compost to heavy or compacted soils. Install terraces or other features on slopes to keep water on site.
- ◆ **Check and maintain your irrigation system** so water doesn't run off your landscape onto hard surfaces and into gutters.
- ◆ **Improve watering efficiency and distribution** by using equipment such as drip irrigation, soaker hoses, and "smart" irrigation controllers and rotor heads.



Illustrations by Celeste Rusconi

Minimize the use of pesticides that pollute our waterways. Use nonchemical alternatives or less toxic pesticide products whenever possible. Read product labels carefully and follow instructions on proper use, storage, and disposal.

For more information about managing pests, contact your **University of California Cooperative Extension** office listed under the county government pages of your phone book or visit the UC IPM website at ipm.ucanr.edu.

What you use in your landscape affects our rivers and oceans!

UC | **University of California**
CE | **Agriculture and Natural Resources**
University of California Cooperative Extension
Integrated Pest Management
UC ANR is an equal opportunity provider and employer.

October 2017

Garden Chemicals: Safe Use & Disposal

Pesticides, such as insecticides, herbicides, and fungicides, are designed to be toxic to the pests they target.



When used properly, pesticides can protect your plants or home from damage. However, when the label instructions aren't followed correctly, plant injury may occur, pests may not be controlled, human

health may be impaired, and pesticides may contribute to soil, air, or water pollution. Fertilizer products may also have negative environmental impacts when they get into waterways.

Are pesticides necessary to control pests?

- Use pesticides only when nonchemical methods are ineffective and pests are reaching intolerable levels, then choose the least toxic, most effective product.
- Contact your local UC Master Gardener or Cooperative Extension office for help identifying your pest or an alternative pest control method.

If you must use garden chemicals:

- Select least toxic products that target your pest. Examples include bait stations, insecticidal soaps and oils, and microbial insecticides such as *Bacillus thuringiensis* (Bt).
- Buy ready-to-use products when possible, since they don't have to be measured and mixed.
- Don't water after applying garden chemicals unless the label tells you to. Never let pesticide or fertilizer run off into storm drains.
- Avoid applying chemicals outdoors when rain is forecast or when it is windy.
- Don't apply pesticides or fertilizers on paved surfaces.

For more information about managing pests, visit ipm.ucanr.edu or your local University of California Cooperative Extension office.

When using and storing garden chemicals:

- Always wear shoes, a long-sleeved shirt, pants, eye protection, and any other equipment listed on the product label.
- Properly measure concentrated formulations of pesticides. Keep all measuring tools for the garden separate from those used for food.
- Never apply more product than the amount listed on the label.
- Always keep chemicals in their original container and store them tightly capped in a locked cabinet out of the reach of children and pets.

Finding active ingredients on a pesticide label

Active Ingredient:	KEEP OUT OF REACH OF CHILDREN CAUTION	
Potassium Salts of Fatty Acids.....		1.0%
Other Ingredients.....		<u>99.00%</u>
Total.....		100.00%
Net Contents: 32 FL OZ/946 mL		

Pesticide labels show the active ingredient in a product. This example shows the active ingredient in some insecticidal soaps.

Disposing of pesticides and fertilizers:

- If you can't use up your pesticides and fertilizers, consider giving them away.
- Sewage treatment plants aren't designed to remove all toxic chemicals from wastewater. Pouring garden chemicals into a storm drain, down the sink, or into the toilet pollutes water and is against the law!
- The only allowable way to dispose of pesticides is to use them up according to label directions, or to take them to a household hazardous waste site.
- For the Household Hazardous Waste Disposal site nearest you, call 1-800-CLEANUP (1-800-253-2687) or visit earth911.com for more information.

For help in an emergency, call the California Poison Control System at 1-800-222-1222. Visit calpoison.org for more information.

What you do in your home and landscape affects our water and health.

- Minimize the use of pesticides that pollute our waterways and harm human health.
- Use nonchemical alternatives or less toxic pesticide products whenever possible.
- Read product labels carefully and follow instructions on proper use, storage, and disposal.

Less Toxic Insecticides

Insecticides are chemicals used to kill, prevent, or repel insects.

Insecticides can be an important part of integrated pest management; however, some products can worsen pest problems or harm people or wildlife. Pesticide products referred to as less toxic pesticides cause fewer injuries to people and organisms other than the target pest. The less toxic insecticides listed below should be a first choice when deciding to use pesticides to manage insects. Always check product labels to be sure the pesticide is registered for your plant and pest situation.

Soaps (potassium salts of fatty acids)

Pesticidal soaps control aphids, whiteflies, mites, and other soft-bodied insects. To be effective, complete coverage of pests is needed and sometimes a repeat application is also necessary. Soaps come in easy-to-use spray bottles for small jobs. Several of these products also control plant fungal diseases.

Insecticidal oils

Oils control aphids, whiteflies, mealybugs, scale insects, spider mites, psyllids, and thrips. Good coverage of pests and plants is required. Don't apply to water-stressed plants or when temperatures are above 90°F. Petroleum-based oil products include superior, supreme, narrow range, mineral, and horticultural oils. Plant-based oil products include neem, canola, and other oils.

Microbial insecticides

Microbial insecticides are derived from microorganisms that cause disease only in specific insects.

- *Bacillus thuringiensis* (Bt) subspecies *kurstaki* (Btk) controls leaf-feeding caterpillars. Bt subspecies *israelensis* (Bti) controls mosquitoes and fungus gnats.
- Codling moth granulosis virus (sold as Cyd-X) targets only the codling moth.
- Spinosad controls caterpillars, leafminers, thrips, and several other insects, but it can also harm some beneficial insects.

For more information about managing pests, visit ipm.ucanr.edu or your local University of California Cooperative Extension office.

Botanical insecticides

Derived directly from plant materials, botanicals vary greatly in their chemical composition and toxicity, but usually break down in the environment rapidly.

- Pyrethrins (also called pyrethrum, derived from chrysanthemums) are used against a range of insects but are toxic to fish and aquatic organisms.
- Azadirachtin (from the neem tree but different from neem oil) has limited effectiveness but low toxicity to nontargets.
- Garlic, hot pepper, peppermint, and clove oils are sold as insect repellents to protect plants. Limited information is available about their effectiveness.

Look at the active ingredients section of the pesticide label to see if it lists one of the less toxic chemicals.

Active Ingredient: Potassium Salts of Fatty Acids..... 1.0% Other Ingredients..... 99.0% Total..... 100.0%	KEEP OUT OF REACH OF CHILDREN CAUTION Net Contents: 32 FL OZ/946 mL
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Less toxic pesticides are sold under many brand names.

Avoid these more toxic pesticides:

- Pyrethroids such as permethrin, cyfluthrin, cypermethrin, and bifenthrin are synthetic versions of pyrethrins and can move into waterways and kill aquatic organisms.
- Organophosphates such as malathion, disulfoton, and acephate are highly toxic to natural enemies.
- Carbaryl, the active ingredient in older Sevin products, harms bees, natural enemies, and earthworms.
- Systemic neonicotinoids (such as imidacloprid and dinoteferan) can be very toxic to bees and parasitic wasps, especially when applied to plants that are flowering.
- Metaldehyde, a common snail bait, is toxic to dogs and wildlife. Use iron phosphate baits instead.

What you do in your home and landscape affects our water and health.

- Minimize the use of pesticides that pollute our waterways and harm human health.
- Use nonchemical alternatives or less toxic pesticide products whenever possible.
- Read product labels carefully and follow instructions on proper use, storage, and disposal.

What is IPM?

Integrated Pest Management (IPM) involves the use of environmentally sound and effective practices to keep pests from invading or damaging your home, garden, or landscape.

IPM usually combines several methods for long-term pest prevention and management to reduce harming you, your family, or the environment. Successful pest management begins with correctly identifying the pest and selecting the appropriate and most effective methods and materials.



CA Reynolds

Monitoring for pests using a hand lens.

Pest prevention and control around the home and landscape includes:

- Monitoring for the presence of pests and their damage
- Altering the home or garden environment to deprive pests of food, water, and shelter
- Keeping pests out by using barriers, screens, and caulk
- Planting pest-resistant or well-adapted plant varieties, such as native plants
- Discouraging various pests by modifying the way you design, irrigate, fertilize, and manage your garden
- Squashing, trapping, washing off, or pruning out pests
- Using mulch for weed control
- Encouraging beneficial insects to live in your garden

Biological control

Most gardens contain far more “good bugs,” or beneficial insects, than pest insects. Beneficial organisms (also called natural enemies) kill pests and play an important role in IPM. Help beneficials by choosing plants that provide pollen and nectar, keeping ants out of pest-infested plants, and avoiding the use of certain pesticides that kill or harm the good bugs.

For more information about managing pests, visit ipm.ucanr.edu or your local University of California Cooperative Extension office.

Learn about the adult and larval stages of common beneficials.

- Lady beetles (ladybugs): adults and larvae eat aphids.
- Lacewings: larvae feed on many insect pests; you’ll often see adults around lights.
- Syrphid flies: larvae eat aphids; adults resemble honey bees and hover around flowers.
- Parasitic mini-wasps: many species lay their eggs inside pests such as aphids or caterpillars; after hatching, the larvae consume the pest and kill it.
- Spiders: all spiders feed on insects and other arthropods.



Lady beetle adult



Lady beetle larva

Jack Kelly Clark

What about pesticides?

- Most pests can be managed without using pesticides.
- Use pesticides only if nonchemical controls are ineffective and monitoring confirms that pests are reaching intolerable or damaging levels.
- If pesticides are necessary, use them in combination with the nonchemical methods described above.
- Choose pesticides carefully. Use the least toxic, yet effective material that targets the pests but has little impact on human health and the environment.
- Examples of least toxic pesticides include:
 - Soaps and oils for soft-bodied insects like aphids
 - Microbials such as *Bacillus thuringiensis* (Bt) for caterpillars
 - Borate products in bait stations for ants
 - Dusts such as borate or silica in cracks or crevices for household pests

What you do in your home and landscape affects our water and health.

- Minimize the use of pesticides that pollute our waterways and harm human health.
- Use nonchemical alternatives or less toxic pesticide products whenever possible.
- Read product labels carefully and follow instructions on proper use, storage, and disposal.

Mantener el agua limpia

Los pesticidas y fertilizantes para el hogar y el jardín contaminan las vías fluviales de California.

Los problemas surgen cuando arrojamos productos químicos para el jardín en el drenaje o cuando los residuos de estos productos son arrastrados hasta las alcantarillas, drenaje pluvial o arroyos por la lluvia, el agua de riego del jardín o al limpiar con una manguera. Los productos químicos para el jardín no sólo amenazan la vida acuática, sino también pueden afectar la calidad de nuestra agua potable. Siga estos consejos para mantener nuestros ríos, arroyos y océanos limpios.

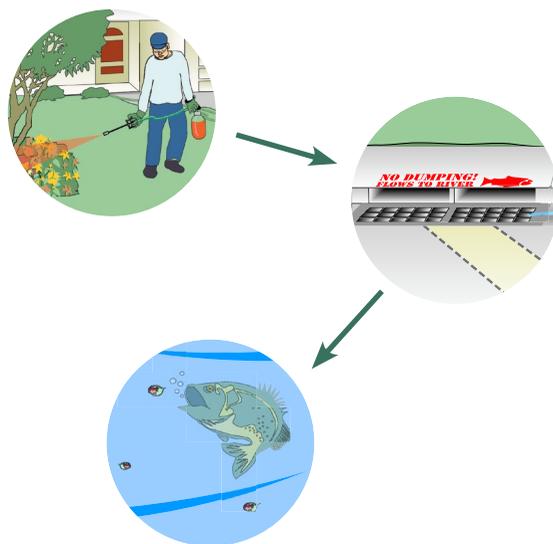
¿Qué puede hacer usted para proteger la calidad del agua?

- **Limite el uso de pesticidas.** Use métodos alternativos sin químicos o pesticidas menos tóxicos siempre que pueda. Si tiene problemas con plagas, pida ayuda a un Jardinero Maestro de la Universidad de California.
- **Evite usar insecticidas piretroides.** Estos productos, que incluyen *bifenthrin*, *cypermethrin* y *permethrin*, son algunos de los más tóxicos para animales acuáticos.
- **Controle las hormigas** al reducir las fuentes de comida, excluirlas de su vivienda y usar cebos en recipientes en lugar de aerosoles. **No utilice insecticidas para insectos del césped** a menos de que esté seguro que hay un problema.
- **Reduzca la cantidad de fertilizantes.** Más no es mejor. El césped en crecimiento, arbustos con flores y algunas plantas de temporada y árboles frutales requieren de alimento regularmente, pero los árboles ornamentales, no. Use una cortadora de césped que a la vez triture (un *mulching mower*) para reciclar los recortes del jardín y reducir las aplicaciones de fertilizante.
- **Use fertilizantes de acción retardada**, inclusive fertilizantes de abono orgánico, los cuales tienden a mezclarse menos con el agua. Asegúrese de medirlos y aplicarlos según las instrucciones de la etiqueta.
- **No permita que los fertilizantes y pesticidas caigan sobre superficies duras** como aceras y caminos de entrada. Barra hacia el césped cualquier material que caiga por casualidad sobre estas superficies.
- **Deseche los productos químicos para el jardín correctamente.** Nunca barra, lave con la manguera o tire los sobrantes de pesticidas o fertilizantes en el drenaje o alcantarillas. Deseche estos productos en el centro de recolección local de desechos caseros peligrosos.

Para más información, visite ipm.ucanr.edu o contacte su oficina local de Extensión Cooperativa de la Universidad de California.

¡Reduzca el escurrimiento de agua con un jardín que use agua eficientemente!

- **Reduzca la necesidad de agua de su jardín.** Elija plantas y diseños de jardín que requieran poca agua.
- **Minimice el escurrimiento de agua** usando mulch o mantillos sobre el lecho de las plantas y material permeable en las calzadas y entradas a la cochera. Airee y agregue material orgánico como abono vegetal o compost a tierra pesada o compacta. Establezca terrazas u otros elementos en las pendientes para retener el agua en su sitio.
- **Revise y de mantenimiento al sistema de riego** para evitar que el agua se escurra del jardín y vaya a parar a superficies duras y alcantarillas.
- **Mejore la eficacia y distribución del riego** usando equipo como riego por goteo, mangueras de remojo y controladores de riego “inteligentes” y cabezas de rotor.



Illustrations by Celeste Rusconi

Llame al 1-800-253-2687 para encontrar el centro más cercano a su hogar.

Lo que hace usted en su hogar y jardín afecta nuestra agua y salud.

- Reduzca al mínimo el uso de pesticidas que contaminan nuestros canales y afectan salud humana.
- Utilice alternativas no químicas o pesticidas menos tóxicos siempre que sea posible.
- Lea las etiquetas de los productos cuidadosamente y siga las instrucciones sobre el uso, almacenamiento y eliminación correcto.

Manejo Integrado de Plagas

El Manejo Integrado de Plagas o MIP (IPM, por sus siglas en inglés) utiliza métodos que no perjudican al medio ambiente, pero que son efectivos para evitar que las plagas se conviertan en una molestia para usted y dañen su hogar, plantas o paisaje.

Por lo general, el MIP combina varios métodos de manejo para prevenir y controlar los problemas de plagas a largo plazo sin causar daño a usted, su familia o el medio ambiente. El manejo exitoso de plagas comienza con la identificación correcta de la plaga y la selección de los métodos y materiales más apropiados y efectivos.



Monitoreando la presencia de plagas con una lupa.

La prevención y control de plagas en el hogar y paisaje incluye:

- Monitorear la presencia de plagas y el daño que causan
- Alterar el ambiente en el hogar y jardín para privar a las plagas de alimento, agua y refugio
- Mantener a las plagas alejadas mediante el uso de barreras, mosquiteros y macilla para rellenar orificios
- Plantar variedades de plantas resistentes a las plagas o que se adaptan bien, como las plantas nativas
- Desalentar la presencia de varias plagas modificando la forma en la que diseña, riega, fertiliza y cuida su jardín
- Aplastar, atrapar, derribar con agua o podar las partes de la planta infestadas; usar mantillo o cubiertas para el control de malezas
- Atraer a los insectos benéficos para que vivan en su jardín

Control biológico

La mayoría de los jardines contienen mucho más “insectos buenos” o benéficos, que insectos que son una plaga. Los insectos benéficos y otros organismos (también llamados enemigos naturales) matan a las plagas y juegan un papel muy importante en el MIP. Ayude fomentando a los insectos benéficos eligiendo plantas que proporcionen polen y néctar, manteniendo las plantas infestadas con plagas libres de hormigas y evitando el uso de ciertos pesticidas que los matan o dañan.

Para más información, visite ipm.ucanr.edu o contacte su oficina local de Extensión Cooperativa de la Universidad de California.

Aprenda a identificar los etapas de larva y adulto de los insectos y arañas benéficos comunes:

- Catarinas (vaquitas, mariquitas): los adultos y larvas se alimentan de áfidos
- Crisopas: las larvas se alimentan de muchos insectos plaga; a los adultos se les puede ver con frecuencia cerca de las luces
- Sírfidos (mosca de las flores): la larva de este tipo de mosca se alimenta de áfidos; en su fase adulta se parecen a las abejas melíferas y revolotean alrededor de las flores
- Las avispidas parasíticas: muchas especies ponen sus huevecillos dentro de las plagas como los áfidos y orugas; las larvas consumen y matan a la plaga
- Arañas: todas las arañas se alimentan de insectos y otros artrópodos



Una catarina adulta.



Larva de la catarina.

¿Debería usar pesticidas?

- La mayoría de las plagas pueden ser controladas sin el uso de pesticidas.
- Sólo use pesticidas cuando los métodos no químicos resultan inefectivos y las plagas están alcanzando niveles intolerables.
- Si el uso de pesticidas es necesario, combínelos con los métodos no tóxicos mencionados anteriormente.
- Escoja los pesticidas cuidadosamente y utilice los productos menos tóxicos y más efectivos que ataquen a las plagas, pero que tengan un impacto mínimo en la salud humana y el medioambiente.
- Ejemplos de insecticidas menos tóxicos:
 - ♦ Jabones y aceites
 - ♦ Productos microbianos, como *Bacillus thuringiensis* (Bt) y *spinosad*
 - ♦ Productos a base de borato en estaciones de sebos para hormigas
 - ♦ Polvos como borato o sílice en grietas y hendiduras para plagas en el hogar

Lo que hace usted en su hogar y jardín afecta nuestra agua y salud.

- Reduzca al mínimo el uso de pesticidas que contaminan nuestros canales y dañan salud humana.
- Utilice alternativas no químicas o pesticidas menos tóxicos siempre que sea posible.
- Lea las etiquetas de los productos cuidadosamente y siga las instrucciones sobre el uso, almacenamiento y eliminación correctos.

Uso y desecho seguro de pesticidas

Los pesticidas (insecticidas, herbicidas, fungicidas, etc.) están diseñados para que sean tóxicos para las plagas que deben controlar.

Cuando se usan adecuadamente, los pesticidas pueden proteger sus plantas o su hogar contra daños. Sin embargo, cuando las instrucciones de la etiqueta no se siguen correctamente, se pueden dañar las plantas, la salud humana puede verse afectada y los pesticidas pueden contribuir a la contaminación del suelo, aire o agua, además de que las plagas no son controladas. Los productos fertilizantes también pueden tener un impacto ambiental negativo cuando entran a las vías fluviales.



¿Son los pesticidas necesarios para el control de plagas?

- Use pesticidas solo cuando los métodos no químicos sean ineficaces y las plagas alcancen niveles intolerables, en ese caso, elija el producto menos tóxico y más efectivo.
- Contacte a su Jardiner Maestro o a la oficina de Extensión Cooperativa local para que le ayuden a identificar el tipo de plaga presente o un método alternativo para el control de plagas.

Si tiene que usar químicos para el jardín:

- Seleccione los productos menos tóxicos dirigidos para la plaga presente. Entre los ejemplos se incluyen estaciones de cebo, jabones y aceites insecticidas e insecticidas microbianos, como el *Bacillus thuringiensis* (Bt).
- Compre productos listos para usarse siempre que sea posible, para que no tenga que medir o mezclarlos.
- No riegue después de aplicar los químicos para el jardín a menos que la etiqueta así lo indique. Nunca permita que los pesticidas o fertilizantes se escurran hasta las alcantarillas.
- Evite aplicar estos químicos cuando hay pronósticos de lluvia o hace viento.
- No aplique pesticidas o fertilizantes en las áreas pavimentadas.

Para más información, visite ipm.ucanr.edu o contacte su oficina local de Extensión Cooperativa de la Universidad de California.

Tome estas precauciones al usar y almacenar pesticidas:

- Use siempre zapatos, camisa de manga larga, pantalones y protección para los ojos y todo el equipo recomendado en la etiqueta.
- Mida con precaución pesticidas concentrados siguiendo las instrucciones del producto. Mantenga todas las herramientas y utensilios de medición para el jardín separados de las que usa para la comida.
- Nunca aplique más cantidad del producto que lo que indica la etiqueta.
- Mantenga siempre los pesticidas en su envase original y guárdelos con la tapadera bien apretada en un gabinete bajo llave fuera del alcance de los niños y mascotas.

Cómo encontrar los ingredientes activos en las etiquetas de pesticidas:

Active Ingredient: Potassium Salts of Fatty Acids	1.0%	KEEP OUT OF REACH OF CHILDREN CAUTION
Other Ingredients	99.0%	
Total	100.00%	
Net Contents: 32 FL OZ/946 mL		

Las etiquetas de los pesticidas muestran el ingrediente activo en un producto. Este ejemplo muestra el ingrediente activo en algunos jabones insecticidas.

Desecho de pesticidas y fertilizantes.

- Regale el pesticida, fertilizante o herbicida que le sobre a alguna persona que pueda usarlo.
- Las plantas de tratamiento de aguas residuales no están diseñadas para eliminar todos los químicos tóxicos de las aguas residuales. Por lo tanto, vaciar los químicos para el jardín en las alcantarillas, fregaderos e inodoros contamina el agua y va en contra la ley.
- La única manera permitida de desechar sobrantes de pesticida es usándolos de acuerdo con las instrucciones de la etiqueta o llevándolos a un centro de recolección de desechos domésticos peligrosos.
- Para el sitio más cercano del Servicio de Recolección de Desechos Domésticos Peligrosos (Household Hazardous Waste Disposal), llame al 1-800-CLEANUP (1-800-253-2687) o visite www.earth911.com para más información.

En caso de emergencia, llame al **California Poison Control System (Sistema para el Control de Envenenamientos de California)** al 1-888-222-1222. Para más información visite calpoison.org.

Lo que hace usted en su hogar y jardín afecta nuestra agua y salud.

- Reduzca al mínimo el uso de pesticidas que contaminan nuestros canales y afectan salud humana.
- Utilice alternativas no químicas o pesticidas menos tóxicos siempre que sea posible.
- Lea las etiquetas de los productos cuidadosamente y siga las instrucciones sobre el uso, almacenamiento y eliminación correctos.

Insecticidas menos tóxicos

Los insecticidas son sustancias que se aplican para controlar o repeler insectos.

Pueden ser parte importante de control integrado de plagas. Sin embargo, algunos productos pueden empeorar los problemas de plagas o hacer daño a las personas o a la vida silvestre. Los productos conocidos como “pesticidas menos tóxicos” causan pocos daños a personas y organismos a los que no van dirigidos. Si necesita usar insecticidas para controlar insectos elija uno en la siguiente lista. Siempre revise la etiqueta para asegurarse que estén registrados para aplicar en sus plantas o contra las plagas en su situación.

Jabones (sales de potasio de ácidos grasos):

Los jabones insecticidas controlan a los áfidos, moscas blancas y ácaros. Se debe cubrir las plagas y las plantas por completo con el jabón, y algunas veces se requiere una segunda aplicación. Se venden en botellas con rociadores fáciles de usar para infestaciones leves.

Aceites insecticidas:

Los aceites ayudan a controlar a los áfidos, moscas blancas, piojo harinoso, cochinillas, arañaueles, psílidos y trips. Se requiere una buena cobertura. No los aplique a plantas que se encuentran bajo estrés por falta de agua o cuando las temperaturas son superiores a los 90°F. Los productos de aceite a base de petróleo incluyen los aceites superior, supremo, aceites livianos y los aceites de horticultura. Los aceites vegetales incluyen el aceite de nim, canola y otros aceites.

Insecticidas microbianos:

Los insecticidas microbianos derivan de microbios que causan enfermedades en ciertos insectos específicos:

- Las subespecies kurstaki del *Bacillus thuringiensis* (Btk) controlan a las orugas que se alimentan de hojas.
- Las subespecies israelensis del *Bacillus thuringiensis* (Bti), que se venden en tabletas, controlan a los mosquitos.
- Spinosad es un insecticida a base de microbios que controla a las orugas, mineros de las hojas y trips, pero también puede dañar a algunos insectos benéficos.

Nematodos que se alimentan de insectos:

Los nematodos son gusanos microscópicos, y algunos tipos (*Steinernema* y *Heterorhabditis*), se alimentan de insectos. Úselos para controlar a los insectos del césped, la palomilla de alas transparentes y el gusano carpintero. Debido que se son organismos vivos son perecederos, así que comprellos por correo para asegurarse que lleguen frescos.

Los insecticidas botánicos:

Provenientes directamente de material vegetal, los insecticidas botánicos varían en su composición química y su toxicidad, pero por lo general se descomponen rápidamente.

- Pyrethrins (pyrethrum) matan a una amplia gama de insectos pero son tóxicos para los peces y organismos acuáticos.
- Azadirachtin, proviene del árbol del nim, tiene una efectividad limitada contra las plagas, pero baja toxicidad contra insectos a los que no va dirigido. No lo confunda con el aceite de nim (neem oil).
- El ajo, el ají picoso, el aceite de menta o de clavo de olor se venden como repelentes de insectos para proteger a las plantas. Hay poca información sobre su eficacia.

Evite estos pesticidas de mayor toxicidad:

- Los piretroides (pyrethroids) como permethrin, cyfluthrin, cypermethrin y bifenthrin si llegan hasta las vías fluviales matan a los organismos acuáticos.

Cómo encontrar los ingredientes activos en las etiquetas de pesticidas:	
Active Ingredient:	KEEP OUT OF REACH OF CHILDREN
Potassium Salts of Fatty Acids	1.0%
Other Ingredients	99.0%
Total	100.00%
Net Contents: 32 FL OZ/946 mL	
Las etiquetas de los pesticidas muestran el ingrediente activo en un producto. Este ejemplo muestra el ingrediente activo en algunos jabones insecticidas.	

- Los organofosforados como malathion, disulfoton y acephate son tóxicos para los enemigos naturales.
- Imidacloprid es un insecticida sistémico que puede ser tóxico para las abejas y avispidas parásitas, especialmente si se aplican a plantas en flor.
- Metaldehyde, es un cebo para caracoles, que es tóxico para perros y animales silvestres. Mejor use cebos que contengan iron phosphate (fosfato de hierro).

Lo que hace usted en su hogar y jardín afecta nuestra agua y salud.

- Reduzca al mínimo el uso de pesticidas que contaminan nuestros canales.
- Utilice alternativas sin químicas o productos pesticidas menos tóxicos siempre que sea posible.
- Lea las etiquetas de los productos cuidadosamente y siga las instrucciones sobre el uso, almacenamiento y eliminación correcto.

Para más información sobre el control de plagas, visite ipm.ucanr.edu o la oficina local de Extensión Cooperativa de la Universidad de California.

APPENDIX B

Integrated Pest Management Plan

Integrated Pest Management Plan

Table of Contents

Statement of Purpose 3
Goals..... 3
Strategy 3
Scope 3
Record Keeping..... 3
Performance Measurements, Quality Assurance and Control..... 4
Responsible Parties..... 4
Pest Control Contractors 4
Building User Notification 5
Emergencies..... 5
Approved Pesticides 5
Practices 7
Training..... 11
Definitions..... 12
Resources 13
Attachments 13

Integrated Pest Management Plan

Statement of Purpose

The purpose of this Integrated Pest Management (IPM) Plan is to help guide in the use of environmentally sensitive pest management strategies and least-toxic control methods in the City of Shasta Lake (City). IPM is defined as managing pests (plants, fungi, insects, and/or animals) in a way that protects human health and the surrounding environment and that improves economic returns through the most effective, least-risk option. Core elements of IPM include:

- Use of least-toxic chemical pesticides
- Minimum use of chemicals
- Use of chemicals and pesticides only in targeted locations and for targeted species
- Routine inspection and monitoring
- Proactive communication

Goals

The goals of the City's IPM Plan are to minimize the impact of site management practices on the local environment and to reduce the exposure of occupants, staff, and maintenance personnel to potentially hazardous chemical; biological; and particle contaminants.

The plan addresses environmental best practices for outdoor and indoor IPM. Outdoor IPM should focus on keeping the property's pest populations under control and preventing pests from entering the building, with a focus on the building envelope and landscaping features. Indoor IPM should focus maintaining the building envelope to avoid intrusions and management of pest attractants. Any cleaning products used for IPM must meet the requirements of LEED® for Existing Buildings: Operations and Maintenance™ IEQ Credit 3.3: Green Cleaning, Purchase of Sustainable Cleaning Products and Materials.

Strategy

IPM promotes the use of a range of preventative and non-chemical approaches to control pest populations and stave off infestation. If an infestation with unacceptable impacts occurs, thereby warranting additional treatment, IPM favors the use of least-toxic pesticides. The targeted application of a toxic pesticide is allowed only after all other reasonable non-toxic options are exhausted. This plan outlines preventative best practices and pest control strategies approved for use at the building. Provisions for the use of least-toxic pesticides and toxic chemicals, when necessary, are outlined should a pest infestation occur.

Scope

This IPM Plan applies to the building interior and grounds of all City's facilities. The plan includes approved IPM strategies for managing and eradicating pests that are common to the area and provides resources to facilitate learning about new and emerging IPM strategies. This plan is applicable at all times.

Record Keeping

Monitoring the effectiveness of the IPM Plan over time requires diligent tracking of several items: pest populations and locations, management strategies employed, quantities and types of

chemicals and products used, and the outcome of pest management activities. The City shall maintain records that include the information below:

1. Notification to occupants: date, time of application, and method.
2. Date, time, and location of pesticide application.
3. Targeted pest.
4. Prevention and other non-chemical methods of control used.
5. Type and quantity of pesticide used, including trade name and active ingredient.
6. Summary of results.
7. Name of the pesticide applicator.
8. Application equipment used.

Performance Measurements, Quality Assurance and Control

The environmental performance of the IPM Plan shall be compiled from IPM records and analyzed on a semi-annual basis. An IPM Report identifying the types of pest problems encountered at the buildings and the types and quantities of all pesticides used shall be generated by the City for review. The following metrics shall be tracked throughout the year and documented in the report to evaluate the IPM Plan:

1. The severity and location of all major pest infestations.
2. The amount of each pesticide product used by volume.

Routine inspections will be performed by City personnel, including facilities and custodial staff. Particular attention will be paid to problem areas, referring to the IPM log for guidance. Building occupants are instructed to report any problems to the IPM Coordinator, which will trigger a response with a response time appropriate to the nature of the situation. The overall IPM Plan will be reviewed on an annual basis by the City Engineer.

Responsible Parties

The IMP Coordinator is responsible for maintaining consistent and correct implementation of the IPM Plan. City and Professional Exterminators of Redding are responsible for record keeping and performance measurement. The compiled records from all parties will be archived by the City as part of an annual IPM review.

Title	Contact	Phone	Area of Responsibility
IPM Coordinator	Kathie Reed	(530) 275-7487	Coordination
Pest Management Company	Professional Exterminators of Redding	(530) 338-2822	Pesticide Applicator
City Engineer	Jeff Tedder	(530) 275-7423	Oversight

Pest Control Contractors

When the City enters into a new pest control contract or extends the terms of an existing contract that authorizes a licensed contractor to apply pesticides in the building interior or grounds, the contract shall require that the contractor comply with this IPM Plan. The Contract Documents shall also require the contracted company to maintain records in accordance with the IPM Plan and submit this information to the City when requested.

Building User Notification

Notifying building users and occupants of pesticide applications is a critical component of the IPM Plan. Providing the appropriate information at the appropriate time enables individuals to take precautions as they see necessary to protect their personal health. A 72-hour advance notice to building occupants is required for the application of any pesticide other than a least-toxic pesticide or self-contained, non-rodent bait in a building or the surrounding grounds under normal conditions. Advance notice procedures shall take the following form:

1. Applications will be logged with the IPM Coordinator.
2. Signs will be posted at the building's main entry at least three business days before application of a pesticide and left in place for at least three business days after application. Signs must be standardized and easily recognizable.
 - a. Each sign must contain the following information:
 - i. The name and active ingredient of the pesticide product.
 - ii. The targeted pest.
 - iii. The application date.
 - iv. Information indicating the toxicity category of the pesticide product.
 - v. The name and phone number of an individual that is responsible for fielding questions regarding the application.
3. Email notification is an additional communication option when signs are determined to not be a reasonable notification option, such as a significant time or resource constraint.

Emergencies

A pest outbreak is considered an emergency when it poses an immediate threat to public health or will cause significant economic or environmental damage if treatment is prolonged.

Notification of emergency pesticide applications must be given within 24 hours of the application, in accordance with procedures outlined in the "Building User Notification" section of this plan.

Approved Pesticides

Chemical pesticides are considered a last resort under the tenets of IPM. Pesticides are to be used by the City after non-chemical options have been exhausted, with a preference for use of a Tier 3 pesticide. The tier rankings are outlined in the 2020 San Francisco Reduced-Risk Pesticide List, where a Tier 3 pesticide was determined by hazard screening to be of "lowest concern," because the product contains:

- no known, likely, or probable carcinogens;
- no reproductive toxicants (CA Prop 65 List);
- no ingredients listed by the EPA as known, probable, or suspect endocrine disrupters;
- active ingredients that have a soil half-life of thirty days or less;
- and is labeled as not toxic to fish, birds, bees, wildlife, or domestic animals.

Non-rodent pesticides are also considered least toxic if they exceed the Tier 3 criteria but are used in self-contained baits and placed in inaccessible locations. Rodent baits are not considered least toxic under any circumstances.

Examples of Tier 3 products are:

Product Name	Active Ingredient
Advion Ant Gel (indoor use)	Indoxacarb 0.05%
Advion Cockroach Bait Arena (indoor use)	Indoxacarb 0.05%
Gentrol or other Hydroprene-only product	Hydroprene 90.6%

Tier 2 products are of “moderate concern” and to be used under emergency conditions (as defined above) or in the event that both preventative methods and least-toxic pesticides prove to be ineffective at pest control.

Examples of Tier 2 products approved for use under the conditions outlined above are:

Product Name	Active Ingredient
Safer Soap O-Insecticidal Soap Concentrate	Potassium Laurate 49.52%
Maxforce Impact Roach Gel Bait	Clothianidin 1%
Cholecalciferol Block Baits	Cholecalciferol

Tier 1 products are not intended for use except when there is a concern for public safety and in situations where the use of a Tier 2 product is inadequate or unsafe.

Practices

Pest control chemicals are not stored on the City’s property and application is performed primarily by a Contractor, with the City performing occasional applications. Professional Exterminators of Redding are credentialed pest control providers and utilize best practices for chemical storage, preparation, handling, and disposal.

CHEMICAL APPLICATION PRACTICES	
User Qualifications	<ul style="list-style-type: none"> ▪ Most chemical application and advice on pest management problems will be made by a licensed pest control company, particularly in the creation of customized IPM problems, which may require detailed knowledge of the biology and ecology of a particular species. ▪ If pesticides are required, City staff will coordinate with a licensed pest control company to determine the best product and application in accordance with approval requirements. ▪ Only trained personnel can prepare and use all chemicals.
Species Considerations	<ul style="list-style-type: none"> ▪ Time the treatment to coincide with the presence of the pest. ▪ Use a selective chemical that has the least effect on non-target species and treat only the area affected.
User Safety	<ul style="list-style-type: none"> ▪ Users must wear protective clothing appropriate to the pest chemical application used. ▪ Ensure that anyone handling toxic chemicals never works alone and that the work area is well-ventilated. ▪ Wear a respirator for outdoor spraying or dusting of organic phosphorus compounds. ▪ Eating, drinking, and smoking must be prohibited when using or handling chemicals. ▪ Users must be familiar with the chemicals they are likely to be using, the effects the chemicals may have on the body, and how the chemicals may enter the body. ▪ Users must be aware of the signs and symptoms of acute poisoning related to chemicals they are using. They must stop work if they are feeling ill and seek medical advice.
Equipment	<ul style="list-style-type: none"> ▪ Equipment must be frequently checked and properly maintained, both for health and safety reasons and to minimize spray drift.
Weather/Time Restrictions	<ul style="list-style-type: none"> ▪ Spraying must not be carried out in unsuitable weather. Anyone operating sprayers must have access to a wind-speed meter, and only spray when the wind speed is negligible. ▪ Spraying must not take place within 24 hours of a rain event. ▪ Hours of work must be controlled so that building occupants are not exposed.

BASIC PLANT AND FUNGI CONTROL PRACTICES	
Maintenance	<ul style="list-style-type: none"> ▪ Keep the building grounds well-maintained at all times. Clear plant debris, especially from fruit-bearing trees. ▪ Maintenance personnel shall use mulch and other landscaping best practices, warding off weeds and other pests. ▪ Keep vegetation trimmed at least 18 inches from the building.
Plantings	<ul style="list-style-type: none"> ▪ Maintain and plan landscape features to eliminate safe havens for pests. ▪ Avoid monocultures by mixing plant species in planters and gardens.
Manual Controls	<ul style="list-style-type: none"> ▪ Landscaping shall be hand weeded and chemical control shall be kept to a minimum. This measure prevents human and environmental exposure to hazardous chemicals.
Chemical Controls	<ul style="list-style-type: none"> ▪ When chemical use is necessary, replace hazardous substances with least-toxic chemicals as defined by the 2020 San Francisco Reduced-Risk Pesticide List.
Inspection Schedule and Location	<ul style="list-style-type: none"> ▪ Responsible parties will inspect the site at regular intervals to monitor and apply pest controls operations.

BASIC ANIMAL PEST CONTROL PRACTICES	
Site/Building Cleanliness	<ul style="list-style-type: none"> ▪ Keep garbage containers clean, free of odors, and covered at all times. Sanitation measures reduce habitat and food sources for pests. ▪ Keep areas around garbage containers free of spillage or garbage to prevent the collection of trash or debris on the ground around or underneath the containers. ▪ Keep grounds free of high weeds, trash, old equipment, and debris, as these conditions create ideal harborage for rodents.
Structural Integrity	<ul style="list-style-type: none"> ▪ Maintain the building exterior in good condition with no holes or openings larger than ¼ inch including, but not limited to, windows, doors, fans, vents, etc., to keep pests from entering the building. ▪ Address any deficiencies in the building exterior with corrective measures, i.e., cementing, screening, caulking, installing stripping on door bases, etc. ▪ Maintain door sweeps on all applicable doors to produce a good seal to the ground.
Inspection Schedule and Location	<ul style="list-style-type: none"> ▪ Visual inspections shall be performed on a monthly basis to identify problem areas.

SPECIFIC ANIMAL CONTROL STRATEGIES	
Ants	<ul style="list-style-type: none"> ▪ Always keep food items in sealed containers or store them in the refrigerator or freezer. Clean surfaces and storage areas to remove crumbs and stains. Keep sinks and worktops clean and dry. ▪ Prune branches close to the building or anything that might create a bridge for the ants to cross. ▪ In areas where ants are present, wipe the areas down with soapy water in order to prevent the formation of major scent trails. If there already is an established trail, wipe backwards from the food source to the entrance of the trail. ▪ Treat only areas that have active pest infestations. Temporary blockades can be made using chili powder, cinnamon, boric acid, or sticky substances such as petroleum jelly. ▪ Baits are best put in the path of an ant trail and then removed after the ant activity stops. ▪ Identify the ant species for most relevant measures.
Aphids	<ul style="list-style-type: none"> ▪ Prune out infested leaves. ▪ Knock off aphids by spraying with a strong stream of water. ▪ Wait for hot weather; most aphids are gone by mid-June. ▪ Release ladybugs on heavily infested plants. ▪ Spray with insecticidal oil or soap (Safer Soap).
Bed Bugs	<ul style="list-style-type: none"> ▪ Call professional pest management to inspect and treat for the presence of bed bugs indicted by the initial inspection.
Caterpillars	<ul style="list-style-type: none"> ▪ Obtain a correct identification of the caterpillar in order to prescribe the most appropriate form of control. ▪ Bacterial insecticides derived from natural ingredients are available to control caterpillars.
Cockroaches	<ul style="list-style-type: none"> ▪ There are five main species of cockroaches and effective control depends on identifying them correctly. ▪ All food handling areas should be cleaned frequently. ▪ IPM measures for controlling cockroaches include effective hygiene and exclusion practices, sticky traps lined with pheromones, boric acid, and insect growth regulators.
Dust Mites	<ul style="list-style-type: none"> ▪ Fabrics, bedding, and carpets attract and generate dust and dust mites. To keep dust mites at bay, keep building well-ventilated and dry.
Scales (hard and soft)	<ul style="list-style-type: none"> ▪ Provide plant with proper irrigation. ▪ Encourage natural enemies (ladybugs, lacewings).

SPECIFIC ANIMAL CONTROL STRATEGIES CONTINUED

<p align="center">Flies</p>	<ul style="list-style-type: none"> ▪ Collection of waste and residues should be carried out at least twice a week. ▪ Keep refuse areas clean to avoid providing flies with breeding grounds. ▪ Ensure bin lids fit tightly and the bins are cleaned regularly. ▪ Use fine mesh window and door screens as a barrier against entry by any flying insect. ▪ Ultra-violet (UV) fly killing equipment is very effective so long as it is situated correctly. In food preparation areas, UV equipment should only be used once all possible precautions have been taken to keep flying insects out. Position the UV equipment close to an entry point, at right angles to the nearest competing light source such as a window. In many catering establishments, poorly situated UV equipment poses a greater food hygiene hazard than lacking pest repellants altogether. This is because when placed next to the food preparation area, they draw flies to the food which they are likely to contaminate before being killed. ▪ Natural chemical treatments include pyrethrum extracted from the <i>Chrysanthemum cineraria folium</i> plant that can be used in kitchens and restaurants.
<p align="center">Mosquitoes</p>	<ul style="list-style-type: none"> ▪ Find and eliminate their habitat. ▪ Do not allow flowerpots, buckets, plastic sheeting, or other open containers outside to collect water. ▪ Drain unused pools or fountains so that the water cannot become stagnant. ▪ Drain or fill depressions, mud flats, and other areas that might hold water. ▪ Repair leaking taps and air-conditioning units so that puddles cannot form and ensure that septic tanks and sewage systems are properly maintained and in good working order. ▪ Avoid over-irrigating lawns and gardens, and keep weeds and grass well-clipped. ▪ To prevent mosquitoes from coming indoors, fit fine-mesh screens to porches, doors, and windows.
<p align="center">Fabric/Clothing Moths</p>	<ul style="list-style-type: none"> ▪ Fabrics should be washed and then put in bags and placed in a freezer. When taken out to thaw, shake the fabrics vigorously to remove dead larvae. ▪ Clean the areas where fabrics have been stored with vinegar and water. ▪ Store fabrics in cedar chests or closets. Place cedar chips or blocks or lavender sachets in drawers. ▪ For acute moth problems, reusable traps can be baited with a controlled-release pheromone system to lure moths into the trap and disrupt their mating cycle. ▪ Avoid mothballs and insect foggers.
<p align="center">Pantry Moths</p>	<ul style="list-style-type: none"> ▪ Vacuum affected areas. ▪ Scrub all surfaces with hot water and detergent, especially in corners and around the edges of removable shelves. White vinegar also works. ▪ Food items and containers should be thoroughly cleaned with a detergent and water solution and wiped down with a vinegar rinse before being put back. Use air-tight containers made of hard plastic, glass, or metal and not plastic bags. ▪ Kill any moths with a fly swatter or moth traps. ▪ Peppermint gum, bay leaves, peppercorns, and cloves may also help deter pantry moths.

SPECIFIC ANIMAL CONTROL STRATEGIES CONTINUED	
Rodents	<ul style="list-style-type: none"> ▪ Rodent control should start with a survey to determine the source of the problem and the conditions that encourage the infestation. ▪ Remove food sources. ▪ Eliminate places of refuge. ▪ Openings in building foundations and walls should be closed or screened with wire mesh that has holes not more than 1.25 cm (0.5 in) wide. Where pipes enter masonry, force heavy hardware cloth or steel wool into the opening, then fill it with concrete. ▪ Continuous surveillance is necessary and places where rodents have been gnawing to gain entry to a building should be sealed with metal flashing. ▪ Doors are particularly vulnerable to rodent entry so ensure that external doors and windows close tightly with no gaps at the bottom. ▪ Materials stored in the open, in sheds or in building should be stacked at least 30 cm (1 ft.) above the ground. ▪ Stringent waste disposal practices should be observed – secure all waste in closed containers and not just plastic bags. ▪ Wash bins regularly. Make sure composting bins are designed to prevent rodents from entering. ▪ Bait should be sticky to ensure that the mouse triggers the trap mechanism even if it only lightly touches the bait. Mice prefer peanut butter or chocolate. Bacon, oatmeal, or apples can also be used as bait. ▪ An alternative to snap traps is a battery-operated trap that generates a high voltage once the rat or mouse is inside.
Slugs and Snails	<ul style="list-style-type: none"> ▪ There are various non-chemical solutions to eliminate slugs and snails, including putting salt or sharp shingle around vulnerable plants, drowning them in beer or simply throwing them over a fence. Elemental copper bands also repel snails and slugs. Remove daytime hiding places (weeds, debris, etc.)
Wasps and Hornets	<ul style="list-style-type: none"> ▪ A simple trap can be made by putting beer or a solution of jam or honey and water in an open jar around the grounds. If this does not work, there are branded traps available containing specially formulated attractant baits.

Training

Any person applying pesticides must be trained prior to the use of each pesticide, regardless of toxicity, unless they possess a current Qualified Applicators Certificate or Qualified Applicators License. These individuals are required to have general pesticide safety training annually, which includes:

- A record of each employee applying pesticides and evidence of training certified by the trainer/supervisor. Copies of the record form will be kept by the employee and the City and be available to Environmental, Health, and Safety and county and state officials.
- Persons providing the training must be qualified as one of the following:
 - A California certified commercial applicator.
 - A California certified private applicator.
 - A person holding a valid County Biologist License in Pesticide Regulation issued by the Department of Food and Agriculture.

- A person who has completed an “instructor trainer” program presented by the UC-IPM Project.
- A California registered Professional Forester.
- A Qualified Applicator Certificate.
- A Qualified Applicator License.

In California, any business that provides pesticide management services for hire must have a pest control business license. The City hires Professional Exterminators of Redding to provide pest control services, and the company does hold a valid Pest Control Business Branch License, issued by the California Department of Pesticide Regulation.

The IPM Coordinator is the main point of contact for the City regarding pest management and ensures staff is familiar with the IPM Plan.

Definitions

An **emergency** pest outbreak is one that poses an immediate threat to public health or will cause significant economic or environmental damage.

A **least-toxic pesticide** is any pesticide product for which all active ingredients and known inert ingredients meet the least toxic Tier 3 Pesticide Hazard criteria under the City of San Francisco’s hazard screening protocol. Least toxic also applies to any pesticide product, other than rodent bait, that is applied in a self-contained, enclosed bait station placed in an inaccessible location or applied in a gel that is neither visible nor accessible.

A **pesticide** is any substance or mixture of substances used for defoliating plants; regulating plant growth; or for preventing, destroying, repelling, or mitigating any pest that may be detrimental to vegetation, humans, or animals.

A **tiered pesticide** refers to the City of San Francisco’s pesticide classification system based on hazardous potential. Products are evaluated against a comprehensive list of hazardous criteria including carcinogenicity, reproductive toxicity, endocrine disruption, acute toxicity, hazard to birds/fish/bees/wildlife, persistence, and soil mobility and are placed within a tier structure based on the evaluation results.

- Tier 1 Pesticide: Highest concern. At least one criterion placed in the most hazardous category.
- Tier 2 Pesticide: Moderate concern. At least one criterion placed in the more hazardous category.
- Tier 3 Pesticide: Lowest concern. No criterion flagged for Tier 1 or Tier 2.
- Tier 4 Pesticide: Insufficient information available to assign to the above tiers.

A **first-generation anticoagulant rodenticide** generally requires higher concentrations to be effective and requires multiple feedings over several days but has a shorter duration time in the body. Examples: diphacinone and chlorophacinone.

A **second-generation anticoagulant rodenticide** is far more toxic than first generation, hence it is generally applied in lower concentrations and is lethal after a single ingestion, but it remains in the body far longer. Examples: bromadiolone, brodifacoum, and difethialone.

Resources

The UC-IPM Program develops and promotes the use of integrated, ecologically sound pest management programs in California to serve agriculture, urban and community, and natural resources audiences (www.ipm.ucdavis.edu).

The IPM Institute of North America, Inc. provides news, standards, and information about upcoming IPM conferences and webinars (www.ipminstitute.org).

Beyond Pesticides is a non-profit organization committed to pesticide safety (www.beyondpesticides.org).

Attachments

Attachment 1: 2020 San Francisco Reduced-Risk Pesticides List

ATTACHMENT 1

2020 San Francisco Reduced-Risk Pesticides List



San Francisco Reduced-Risk Pesticide List

for City-Owned Properties

Approved September 22, 2020

How to Use this List

The Reduced Risk Pesticide List (RRPL) includes pesticide products approved for use on *San Francisco City properties* under the SF Integrated Pest Management (IPM) Ordinance (Chapter 3, SF Environment Code).

This list is only one component of San Francisco's IPM program. Pesticides should be the last resort, when all other tactics have failed. The RRPL represents the outer boundaries of acceptable IPM tactics in SF.

This list is San Francisco-specific, and not recommended for other local agencies. The RRPL is created through a collaborative problem-solving process to accommodate the wide variety of highly specialized situations in San Francisco's unique climate. Other agencies are advised to develop their own lists based on their local needs.

This list is not appropriate for homeowners. Homeowners can solve most pest problems with minimal or no pesticide use. For information on managing common pest problems, see [Our Water Our World Factsheets](#).

Exemptions

Exemptions are required for any pesticides (i.e., herbicides, insecticides, fungicides, molluscicides, etc) used on City property for products that are:

- ✓ Not listed on the SF Reduced-Risk Pesticide List — OR —
- ✓ On the RRPL but used differently than described in the RRPL's *Pesticide Limitations column*.

To apply for an exemption, the City department IPM Coordinator should:

1. **Call SFE first** to discuss alternatives, before spending time applying for an exemption.
2. **Fill out this [Pesticide Exemption Request](#).** Allow at least 2 days for your request to be processed. SF Dept. of Environment will only grant exemptions in cases of:
 - a. Well-documented need for the pesticide and when all other alternatives have been tried or deemed impractical — OR —
 - b. For trial use of new reduced risk products

To view approved exemptions in real time, visit our [website](#).

All uses of pesticide under an exemption, as well as any use of pesticides categorized as "*Most Limited*" on the RRPL, must be justified by the relevant City department at the SF IPM Program's annual public hearing.

For City department questions on potential exemptions, contact Chris Geiger, (415) 355-3759, chris.geiger@sfgov.org. For more info on San Francisco's IPM Program, visit: sfenvironment.org/ipm

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations Other uses require an exemption
GENERAL USE PRODUCTS						
Actinovate products	Fungicide	73314-1, 524-641	<i>Streptomyces lydicus</i> WYEC 108	Least hazardous (Tier III)	Least Limited	
Advance 360A Dual Choice Ant Bait Stations	Insecticide	499-496	abamectin B1, 0.011%	Most hazardous (Tier I)	Least limited	
Advion Ant Gel	Insecticide	100-1498	Indoxacarb 0.05%	Least hazardous (Tier III)	Least Limited	
Advion Cockroach Bait Arena	Insecticide	100-1486	Indoxacarb 0.5%	Least hazardous (Tier III)	Least Limited	
Advion Evolution Cockroach Gel Bait	Insecticide	100-1484	Indoxacarb 0.6%	Least hazardous (Tier III)	Least Limited	
Agri-Fos Systemic Fungicide	Fungicide	71962-1	Potassium phosphite 45.8%	Least hazardous (Tier III)	Least Limited	For use on high-value Coast Live Oaks (<i>Quercus agrifolia</i>) susceptible to <i>Phytophthora</i> or in experiments with <i>Phytophthora</i> control, or on high-value Monterey Pines (<i>Pinus radiata</i>) susceptible to <i>Fusarium subglutinas</i>. In accordance with label restrictions for use in California, injection and basal bark spray is the only application method permitted.
Ant and crawling insect baits - borate based - self contained, gel, liquid	Insecticide	Various	Boric acid, sodium tetraborate decahydrate, or other borate salts	Most hazardous (Tier I)	Least Limited	

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations Other uses require an exemption
Aquatrols Capsil	Adjuvant	9037-50003	Polyether Modified Polysiloxane, 20%	Least hazardous (Tier III)	Least limited	Alternative surfactant to CMR product
Avenger Weed Killer Concentrate	Herbicide	92967-1	d-Limonene 60%	Least hazardous (Tier III)	More Limited	Subject to "Restrictions on herbicides." Burndown herbicide. Not for use near water.
Axxe	Herbicide	70299-23	Nonanoic acid, 61%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." Burndown herbicide.
Azatrol EC Insecticide	Insecticide	2217-836	Azadirachtin (2328) 1.2%	More hazardous (Tier II)	More Limited	For greenhouses and established plants for interiorscapes. Do not apply on flowering plants when bees are active. USE UP EXISTING STOCKS - NO LONGER AVAILABLE.
<i>Bacillus thuringiensis</i> insecticides (excluding mosquito control)	Insecticide	Various	<i>Bacillus thuringiensis</i> (various subsp.)	Least hazardous (Tier III)	Least Limited	
BestYet Cedarcide	Insecticide	exemptprod-009	Cedarwood oil, amorphous silica	Least hazardous (Tier III)	Least Limited	
BioLink Buffer & Penetrant	Adjuvant	exemptprod-010	Citric acid 20%, garlic extract 7%	More hazardous (Tier II)	Least Limited	
Cambistat	Growth regulator	74779-3	Paclobutrazol, 22.3%	More hazardous (Tier II)	More limited	For use only on Ficus trees in difficult to access sites due to Muni overhead Lines, track clearances, or similar restrictions that require transit modifications or disallow pruning during normal business hours.
Cimexa Insecticide Dust	Insecticide	73079-12	Amorphous silica gel 100%	Least hazardous (Tier III)	Least Limited	Only for use on ants, rat mites, bedbugs, lice, and yellowjackets in walls when nonchemical techniques prove ineffective.

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations <small>Other uses require an exemption</small>
Clearcast Herbicide	Herbicide	241- 437	Imazamox, ammonium salt	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides."
Competitor	Adjuvant	2935-50173	Ethyl oleate	Least hazardous (Tier III)	Least Limited	
Conserve SC Turf and Ornamental	Insecticide	62719-291	Spinosad 11.6%	More hazardous (Tier II)	Least Limited	For use as a last resort in greenhouses. If feasible, alternate with other products to avoid the development of resistance. Use on high value ornamentals only.
Coyote urine based products	Mammal repellent	exemptprod-014	Coyote urine	Least hazardous (Tier III)	Least Limited	
Debug Turbo	Nematicide	70310-5	Fats & glyceridic oils margosa 65.8%, azadirachtin 0.7%	More hazardous (Tier II)	Least Limited	
Detour	Mammal repellent	exemptprod-015	White pepper 3%, white mineral oil 87%, silica 10%	Least hazardous (Tier III)	Least Limited	
Essentria IC3	Insecticide	exemptprod-013	Rosemary oil 10%, geraniol 5%, peppermint oil 2%, wintergreen oil, white mineral oil, vanillin, polyglyceryl oleate	Least hazardous (Tier III)	Least Limited	

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations <small>Other uses require an exemption</small>
Garlon 4 Ultra	Herbicide	62719-527	Triclopyr, butoxyethyl ester 60.45%	Most hazardous (Tier I)	Most Limited	Subject to "Restrictions on herbicides" Use only for targeted treatments of high profile or highly invasive exotics via dabbing or injection. May use for targeted spraying only when dabbing or injection are not feasible. USE UP EXISTING STOCKS (Vastlan is safer alternative)
Havahart Critter Ridder	Mammal repellent	50932-10	Oil of black pepper 0.48%	Least hazardous (Tier III)	Least Limited	
Hydroprene-only products	Various	Various	Hydroprene	Least hazardous (Tier III)	Least Limited	
Lifeline Herbicide	Herbicide	70506-310	Glufosinate, ammonium, 24.5%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides."
Maxforce Complete Granular Insect Bait	Insecticide	432-1255	hydramethylnon, 1%	Most hazardous (Tier I)	More Limited	Only for use in bait stations.
Maxforce Impact Roach Gel Bait	Insecticide	432-1531	Clothianidin, 1%	More hazardous (Tier II)	Least Limited	Rotate active ingredients to manage resistance
Met 52 Granular Bioinsecticide	Insecticide	70127-8	Metarhizium anisopliae strain F52, 11%	Least hazardous (Tier III)	Least Limited	Preferred alternative to spinosad products

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations Other uses require an exemption
Milestone	Herbicide	62719-519	Aminopyralid, triisopropanolamine salt (5928) 40.6%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." For invasive species in natural areas or parklands where other alternatives are ineffective, especially for invasive legumes and composites such as yellow star thistle and purple star thistle.
Milestone VM Plus, Capstone	Herbicide	62719-572	Aminopyralid, triisopropanolamine salt, 2%; Triclopyr, triethylamine salt, 16%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." Use only for cut stump or injection
M-pede products	Insecticide	53219-6, 10163-324	Potash soap 49%	More hazardous (Tier II)	Least Limited	USE UP EXISTING STOCK; Safer Soap preferred
Nibor-D	Insecticide	64405-8	Disodium Octaborate Tetrahydrate, 98%	Most hazardous (Tier I)	Least limited	
Nufarm Polaris Herbicide	Herbicide	228-534	Imazapyr, isopropylamine salt, 28%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." Alternative to Tier I herbicides. Use caution with adjoining desirable vegetation.
OhYeah!	Insecticide	exemptprod-002	Sodium lauryl sulfate	Least hazardous (Tier III)	Least Limited	
Orange Guard	Insecticide	61887-1	D-limonene (orange oil) 5.8%	More hazardous (Tier II)	More Limited	Soap spray is preferred for removing ant trails. Minimize use in enclosed areas due to scent. Potential aquatic hazard - do not apply directly to water.
Organocide	Insecticide	exemptprod-010	Sesame oil 5%	Least hazardous (Tier III)	Least Limited	

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Oust XP Herbicide (DuPont)	Herbicide	352-601	Sulfometuron-methyl 75%	More hazardous (Tier II)	Most Limited	Subject to "Restrictions on herbicides." For use only on airport operational areas subject to FAA requirements, or PG&E leased yards.
Pentra-bark Bark Penetrating Surfactant	Adjuvant	83416-50001	Polyalkyleneoxide modified heptamethyltrisiloxane	Least hazardous (Tier III)	Least Limited	
Prescription Treatment Brand Wasp-Freeze Wasp and Hornet Killer	Insecticide	499-362	Phenothrin .12%, d-trans allethrin .129%, CO2	Most hazardous (Tier I)	Most Limited	Use only when a concern for public safety, and in situations where use of soap-based products, Suspend, or physical removal is inadequate or unsafe.
Roundup Custom Herbicide (Aquamaster)	Herbicide	524-343	Glyphosate, isopropylamine salt 53.8%	Most hazardous (Tier I)	Most Limited	Subject to "Restrictions on herbicides."
Safer Soap O-Insecticidal Soap Concentrate	Insecticide	42697-60	Potassium laurate, 49.52%	More hazardous (Tier II)	Least Limited	
Sluggo Slug and Snail Bait	Molluscicide	67702-3	Phosphoric acid, iron(3+) salt (1:1) 1%	Least hazardous (Tier III)	Least Limited	
Spraytech Oil	Insecticide	65328-50001	Soybean oil	More hazardous (Tier II)	Least Limited	
Suppress Herbicide EC	Herbicide	51517-9	Caprylic acid, 47%; capric acid, 32%	More hazardous (Tier II)	Least Limited	Subject to "Restrictions on herbicides." Alternative to Tier I herbicides. Burndown product.

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations Other uses require an exemption
Suspend Polyzone	Insecticide	432-1514	Deltamethrin, 4.75%	Most hazardous (Tier I)	Most limited	Restricted to treatments of stinging insect nests in highly public areas, where slower-working alternatives could result in hazards to the public. May also be used for carpenter bees at Camp Mather when preventive measures have failed
Vastlan	Herbicide	62719-687	Triclopyr choline, 45.2%; glycerol, 3%	More hazardous (Tier II)	Most limited	Subject to "Restrictions on herbicides" Use only for targeted treatments of high profile or highly invasive exotics via dabbing or injection. May use for targeted spraying only when dabbing or injection are not feasible.
Weed Slayer + Agro Gold	Herbicide	TBD	Eugenol 6.0%; water and molasses 94%. Mixed with <i>Bacillus megaterium</i>	Least hazardous (Tier III)	Least Limited	WEED SLAYER/AGRO GOLD REMOVED FROM LIST 12/8/2020 DUE TO STATE QUARANTINE - DO NOT USE!
Zoecon PreCor IGR Concentrate	Insecticide	2724-352	S-Methoprene, 1.2%; mineral oil, refined, 98.8%	Least hazardous (Tier III)	Least Limited	
GOLF PRODUCTS						
Civitas Turf Defense Pre-Mixed	Fungicide	69526-17	Mineral oil, refined, 89%	Least hazardous (Tier III)	Least Limited	
Fosphite Fungicide	Fungicide	68573-2	Potassium phosphate	Least hazardous (Tier III)	More Limited	Only for use on golf courses.
Heritage Fungicide	Fungicide	100-1093	Azoxystrobin 50%	Most hazardous (Tier I)	Most Limited	For use on Harding Park/Fleming golf courses only in preparation for tournament play

San Francisco Reduced-Risk Pesticide List

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Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations <small>Other uses require an exemption</small>
Lontrel Turf and Ornamental Herbicide	Herbicide	62719-305	Clopyralid, 40.9%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." For use on Harding Park/Fleming golf courses only in preparation for tournament play. May be used 1x/year in other golf courses on greens only.
Primo Maxx	Growth regulator	100-937	Trinexapac-ethyl 11.3%, tetrahydrofurfuryl alcohol (THFA)	More hazardous (Tier II)	More Limited	Only use on Harding/Fleming golf courses in preparation for major golf tournaments.
Quinclorac 1.5L	Herbicide	53883-336	Quinclorac, dimethylamine salt, 18.92%	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." For use on Harding Park/Fleming golf courses only in preparation for tournament play.
Rhapsody	Fungicide	264-1155	QST 713 strain of dried Bacillus subtilis, 1.34%	Least hazardous (Tier III)	Least Limited	
Sapphire	Herbicide	62719-547	Penoxsulam	More hazardous (Tier II)	More Limited	Subject to "Restrictions on herbicides." Only use on City-owned golf courses in preparation for major golf tournaments, or for pilot testing elsewhere as a glyphosate alternative.
Tourney	Fungicide	59639-144	Metconazole, 50%; Silica-crystalline quartz	Most hazardous (Tier I)	More Limited	For management of pink snow mold (<i>Microdochium nivale</i>) on Harding Park/Fleming golf courses only in preparation for tournament play.
Trimmit 2SC	Growth regulator	100-1014	Paclobutrazol 22.3%	More hazardous (Tier II)	More Limited	For use only on golf courses in preparation for tournament play.

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations Other uses require an exemption
Trinity Fungicide	Fungicide	7969-257	Triticonazole, 19.2%	Most hazardous (Tier I)	More Limited	For use on Harding Park/Fleming golf courses only in preparation for tournament play. May be used 1x/year in other golf courses on greens only.
Turflon Ester	Herbicide	62719-258	Triclopyr, butoxyethyl ester 61.6%	More hazardous (Tier II)	Most Limited	Subject to "Restrictions on herbicides." Subject to "Restrictions on herbicides". Targeted treatment of golf course turf. Quinclorac should be the first option. HIGH PRIORITY TO FIND ALTERNATIVE.
VECTOR CONTROL PRODUCTS						
Agnique MMF	Mosquito control - other	53263- 30	Poly(oxy-1,2-ethanediyl),alpha-isodecyl-omega-hydroxy-phosphate 32%	More hazardous (Tier II)	More Limited	Use for late instar mosquito larvae and pupae, in combination with microbial products. USE UP EXISTING STOCK - NO LONGER SOLD
Contrapest	Rodent contraceptive	91601- 1	Triptolide, 0.001%; 4-vinyl cyclohexene diepoxide, 0.1%	Most hazardous (Tier I)	Least Limited	For long term reductions in rat populations.
Giant Destroyer (smoke bomb)	Rodenticide	10551-1	Carbon, 9%; Sodium nitrate, 50%; Sulfur, 38%	Most hazardous (Tier I)	Most Limited	Alternative to baits for rodents in burrows. Observe label limitations on endangered species and potential for human smoke exposure. Not for use beneath or adjacent to structures
Mosquito control - microbial	Mosquito control - microbial	Various	<i>Bacillus thuringiensis</i> (Berliner or Israelensis) or <i>Bacillus sphaericus</i>	Least hazardous (Tier III)	Least Limited	Any microbial mosquito larvicide with active ingredients <i>Bacillus thuringiensis</i> (Berliner or Israelensis) or <i>Bacillus sphaericus</i> is categorized as Least limited.

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations Other uses require an exemption
Mosquito control products - IGRs	Mosquito control - IGRs	Various	S-Methoprene (5026)	Least hazardous (Tier III)	More Limited	Use for tanks with limited access, or other areas where frequent treatments are infeasible. For City catchment basins, microbial products are preferred. Not for use in estuarine environments except under control of San Mateo Mosquito Abatement District.
Mosquito control products - oils	Mosquito control - other	Various	Highly refined petroleum distillate (mineral oil) - no aromatics	More hazardous (Tier II)	More Limited	Use as a pupacide for public health mosquito treatments.
Rat Ice	Rodenticide	12455- 148	Carbon dioxide	More hazardous (Tier II)	More Limited	
Rodent control - cholecalciferol block baits	Rodenticide	Various	Cholecalciferol	More hazardous (Tier II)	More Limited	See Site-Specific Limitations. For commensal rodent control only in situations with high public health concerns, where trapping is infeasible. In all cases, monitoring shall be used whenever feasible to minimize rodenticide use.
Rodent control - diphacinone baits	Rodenticide	Various	Diphacinone	More hazardous (Tier II)	More Limited	See Site-Specific Limitations. For rat control only in situations with high public health concerns, where trapping is infeasible. Burrow baits not permitted in parks. In all cases, monitoring shall be used whenever feasible to minimize rodenticide use. HIGH PRIORITY TO FIND ALTERNATIVE.

San Francisco Reduced-Risk Pesticide List

for City-owned properties

Product Name	Type	EPA #/ SF code*	Ingredients	Pesticide Hazard Tier**	Use Limitation Type***	Use Limitations <small>Other uses require an exemption</small>
Top Gun All Weather Bait Block Rodenticide	Rodenticide	67517-66	Bromethalin 0.01%	Most hazardous (Tier I)	Most Limited	For use only in City-owned sewer lines, San Francisco International Airport Terminal Areas, or for commercial lessees on city properties that are not adjacent to natural areas. In commercial establishments, use of product shall be a last resort after other, less-toxic measures have been implemented, including sanitation and trapping, and only where a significant public health hazard is recognized by the San Francisco Dept. of Public Health . In all cases, monitoring shall be used whenever feasible to minimize rodenticide use.

*For products exempt from US EPA registration (usually 'Generally Regarded as Safe'), SF creates its own product code

**A product's tier ranking reflects *hazard* (the possibility of harm) but not *risk* (probability of harm). It does not include consideration of likely exposure. Tier rankings determined using the SF Pesticide Hazard Screening Protocol,

<http://sfenvironment.org/download/guide-to-the-reduced-risk-pesticide-list-revised-2013>

***Use limitation type is an informal rating of *risk* (probability of harm), determined by considering a product's hazard tier rating, formulation, likely exposure, and typical uses. Applications of

"most limited" pesticides must be justified at an annual public hearing.

San Francisco Reduced Risk Pesticide List: Restrictions on Herbicides for City Properties

Background

The use of chemical pesticides is always a method of last resort in San Francisco's Integrated Pest Management (IPM) Program. The Reduced Risk Pesticide List and these accompanying restrictions below were created in a public process by the San Francisco Department of the Environment in close consultation with affected City & County of San Francisco departments, in keeping with the Precautionary Principle and Integrated Pest Management ordinances (Environment Code, Chapters 1 and 3). *Any other uses of herbicides require an exemption granted by the San Francisco Department of the Environment.*

Goals

1. Reduce the use of herbicides to those situations where they are only used in situations critical to public health, public safety, and protection of major public assets, including biodiversity assets.
2. Ensure that the restrictions are attainable through continued collaboration among City IPM staff.
3. Minimize potential harm to the environment, City workers, and the general public from any pest management activities, in keeping with the Precautionary Principle.
4. Maximize the ability of city residents to know when and where pesticides are being used.

A. Conditions of use - ALL HERBICIDES

Requirements

1. All treatments must be posted as per City ordinance (Env Code §304). All postings must clearly identify the area to be treated. Postings should be placed in location(s) most likely to be seen by users of the treated area.
2. Blue indicator dyes must be used for spray treatments. The use of blue dye must be noted on the posting. Dye must be mixed at a concentration that makes it clearly visible.

Exceptions:

- a. Blue indicator dye is not required on golf courses, hardscapes, or in cases where posting is not otherwise required.
3. For treatment sites that cannot be readily described using the posting sign alone, a map showing the general location of expected treatment area(s) must be attached to the posting sign.
4. Contractors must be fully briefed and trained in, and implement the San Francisco IPM program's ordinance, requirements and policies.
5. All uses must comply with the California Red-legged Frog Stipulated Injunction.
6. No use on plants with edible berries when ripe fruits are present.
7. No use on green roofs or green wall features.

B. Conditions of use - TIER I HERBICIDES

Tier I ("Most Hazardous") herbicides are subject to Conditions of Use for "ALL HERBICIDES" list above, plus the following:

Requirements

8. Any application of 'most hazardous' herbicides on City property within the City limits or at San Francisco International Airport must be under the direct supervision of a licensed person. A licensed person is defined for these purposes as a person possessing either an Agricultural Pest Control Advisor license, a Qualified Applicator License, or a Qualified Applicator Certificate issued by the California Department of Pesticide Regulation. "Direct supervision" means that the licensed person must be physically present at the site of application.
9. Within the City limits, when 'most hazardous' herbicides are used on publicly accessible parcels, either access to the treatment area must be blocked or a physical demarcation must be set up around the treatment area. Acceptable physical demarcations include fencing, rope, tape, or staked plastic cones.

Exceptions:

- a. Golf courses
- b. Street medians

c. Areas managed for habitat conservation

10. No use for purely cosmetic purposes.
11. No use on the grounds of or within 15 feet of the boundaries of schools, preschools, childrens' playgrounds and other areas frequented by children.
12. No use within 15 feet of designated, actively maintained public paths. "Designated public paths" are walking paths that appear on City maps. If maps do not exist, then "designated public paths" means paths that are actively maintained by City operations.

Exceptions:

- a. Areas falling under state or federal vegetation management requirements, including utility rights of way and easements, dams, reservoir embankments, and watershed lands.
 - b. Cases where alternative control methods pose a significant public safety, public health or fire risk, for example, poison oak along popular trails.
 - c. Street median strips.
 - d. Trails that have been closed to public access, with informative signage (see #1) and physical barriers (see #8).
13. No broadcast spraying using a spray boom is permitted. Use of a backpack sprayer is not considered broadcast spraying, provided that the applicator is targeting specific plants that have been identified for treatment.

Exceptions:

- a. Targeted treatments at Harding Park golf course in preparation for tournament play.

Site-Specific Limitations on Rodenticide Use

Updated 9/24/19

Rodenticides are always a last resort. Due to the concern over primary and secondary poisoning, the type of rodenticide and the manner in which it is applied will be determined by the general site characteristics.

DEFINITIONS:

- Natural area:** Landscape area managed primarily for habitat, or managed for other uses (such as recreational or aesthetic uses) but likely to harbor significant populations of mammal or bird wildlife
- Primary poisoning:** Non-target animal eats poison directly
- Secondary poisoning:** Non-target animal eats poisoned target animal as prey
- Single-feed baits:** Baits with bromethalin, brodifacoum, bromodialone, difenacoum, difethialone active ingredients.

General Site Description	Conditions Where Rodenticide Use is Permitted
Inside of sewers or sewage treatment facilities:	Baits must be secured either inside the sewer or inside a bait box. Single-feed baits permitted. Monitoring with non-toxic baits encouraged.
Commercial enterprises (such as restaurants) on leased City properties	Trapping preferred. Use of single-feed baits shall be a last resort after other, less-toxic measures have been implemented, including sanitation and trapping. <i>Exemption required for any single-feed baits, and only where a significant public health hazard is recognized by the SF Dept. of Public Health.</i>
Interior of structures with occupants (i.e. office space, recreation sites)	Trapping only.
Interior of non-enclosed structures (i.e. storage, stables, airport service areas) – not adjacent to natural areas.	Trapping preferred. Secure and anchored bait stations can be placed inside on a preventative basis. <i>No single-feed baits.</i>
Exterior of structures in urbanized areas (i.e. perimeter of offices)	Trapping preferred. Secure and anchored bait stations can be placed inside on a preventative basis. <i>No single-feed baits.</i>
Exterior of structures in natural areas	Multiple feeding baits may be used only as last resort in case of human health concern or structural integrity. Baits must be secured within bait boxes or buried in burrows. <i>No single-feed rodenticides.</i>
Landscape not adjacent to a natural area	Bait placed deep inside burrows, or secured inside bait boxes. Minimize use of pellets, mouse sized pellets only, must be buried deep in the burrow. <i>No single-feed baits.</i>
Natural area or landscape adjacent to a natural area	Multiple feeding baits may be used only as last resort in case of human health concern or structural integrity. Baiting should be limited to sensitive sites such as campfire areas, or on preventing infestation of structures. Baits must be secured inside bait boxes or burrows. <i>No use of pellets or single feeding rodenticides.</i>

APPENDIX C

City of Shasta Lake Commercial Pesticide Applicators

CITY OF SHASTA LAKE COMMERCIAL PESTICIDE APPLICATORS

COMPANY NAME	PHONE #	ADDRESS
Anderson Pest Solutions	530-351-4846	PO Box 1076, Anderson, CA 96007
Beetlejuice Pest Control	530-223-4000	964 Twin Tower Dr., Redding, CA 96003
Beneficial Insectary	530-226-6300	9664 Tanqueray Ct., Redding, CA 96003
Big Time Pest Control	530-440-7378	2185 Churn Creek Rd., Suite R, Redding, CA 96002
Clark Pest Control	530-278-6711	3080 Crossroads Dr., Redding, CA 96003
Jeff's Pest Control Inc.	530-247-1802	4606 Mountain Lakes Blvd., Redding, CA 96003
Level Extermination	530-241-1598	3335 Placer St., Redding, CA 96001
Paisley Ann's Pest Management	831-206-3031	767 Coronado St., Redding, CA 96003
Pena Pest Control	530-941-6776	3366 Old Lantern Dr., Redding, CA 96003
Pest Management Technology	530-221-3729	9437 Clough Canyon Rd., Redding, CA 96003
Professional Exterminators of Redding	530-338-2822	1551 E Cypress Ave., Suite D, Redding, CA 96002
Redding Spray Service	530-221-3007	Anderson, CA 96007
Sam's Pest Control Service	530-917-3521	
Terminix	530-229-5484	4950 Mountain Lakes Blvd., Suite B, Redding, CA 96003
Trinity Termite & Pest Control	530-222-6990	1620 E Cypress Ave. #7, Redding, CA 96002
Upstate Pest Management	530-226-9385	640 Twin View Blvd., Redding, CA 96003
Woods Pest Control Inc.	530-229-0458	1642 Tahoe Ct., Redding, CA 96003