INTEGRATED PEST MANAGEMENT

2023 ANNUAL REPORT

Prepared by
Marin County Parks

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2023 Summary

Marin County's Integrated Pest Management program applies to 148 sites governed by the County's IPM ordinance, 136 of which were managed without pesticides.

Integrated Pest Management (IPM) is a system of managing pests using careful consideration and integration of all available pest control tools and techniques.

This annual report for the year of 2023 is written for the Board of Supervisors as a requirement of the County of Marin Ordinance No. 3521 and the County of Marin Integrated Pest Management Policy. It serves as a review and summary of the county's pesticide use, cultural practices and non-chemical pest control activities, exemptions granted, training offered, proposed modifications to the county's pesticide list and suggestions for amendments or resources needed for effective implementation of the IPM policy and ordinance.

A total of 36,375 hours was dedicated to non-chemical IPM in 2023. Efforts to protect heritage oaks in Greenbrae was a priority that led to an increase in pesticide use.

Measure A funding supports some IPM work by county staff, and many volunteer projects. However, because Integrated Pest Management is being implemented by multiple departments across many project areas, funding for IPM work itself comes from a variety of associated sources, the majority of which comes from Marin County Parks and the Marin County Department of Public Works.

The IPM Ordinance and Policy were last updated in 2013, requiring that the IPM program is able to maintain accurate statistics that show meaningful reduction in pesticide use over time. Since then, organic and minimum-risk and organic products have largely replaced conventional pesticides wherever possible. This Coordinator Annual Report presents a completed set of data for product usage, non-chemical pest control activities, training offered, and proposed modifications to the county's pesticide list.

Marin IPM program staff will continue to search for new solutions that prioritize organic and minimum risk alternatives.

2023 IPM Achievement Awardees: Sanzuma Farms and Oscar Lucario

The IPM Achievement Award recognizes individuals and organizations that further the goal of eliminating pesticide use within the Marin County IPM Program.

Since 2013, **Sanzuma Farms** have converted many existing school gardens into producing farms, taught thousands of nutrition classes, and educated the students how to grow their own food without pesticides. Sanzuma also educates local farmers who practice IPM on how to sell their crops to Marin County schools. Sanzuma has fostered partnerships with Health and Human Services of Marin, The Kaiser Foundation, Giving Marin, and many others. The award will be accepted by executive director Lori Davis.

Oscar Lucario is a landscaper designer and land manager with over 20 years of experience in organic sustainable maintenance in Marin and Sonoma Counties. He is currently employed as Landscape Worker II for the City of Sausalito Parks & Recreation Department. One focus of Oscar's work is revitalizing private and public gardens to boost resiliency to a changing climate. These practices include building chemical and pesticide-free habitat for native, medicinal and edible plants, bees, and beneficial insects. He is currently establishing guidelines for organic landscaping with the City of Sausalito.

* See Glossary on page 13 for definitions.

IPM Governance

Marin County Integrated Pest Management

Integrated Pest Management (IPM) is a system of managing pests using careful consideration and integration of all available pest control tools and techniques. The target pest, goals, and site conditions guide a systematic decision-making process on what control methods to use. Mechanical and physical pest controls include weeding, mulching, weed-whipping, and mowing. Cultural control means changing work practices to reduce pests, such as altering irrigation practices to reduce weeds. Biological controls are natural enemies (predators, parasites, pathogens, and competitors) that control pests. Pesticides are used only after it is determined that alternative methods will not be effective. A pesticide is a natural or synthetic chemical preparation used to destroy plant, fungal, insect, or animal pests, and all pesticides used by the county are reported to the California Department of Pesticide Regulation.

Marin County Parks, in collaboration with other County departments, administers IPM for the County of Marin.. The program is governed by County Ordinance 3598.

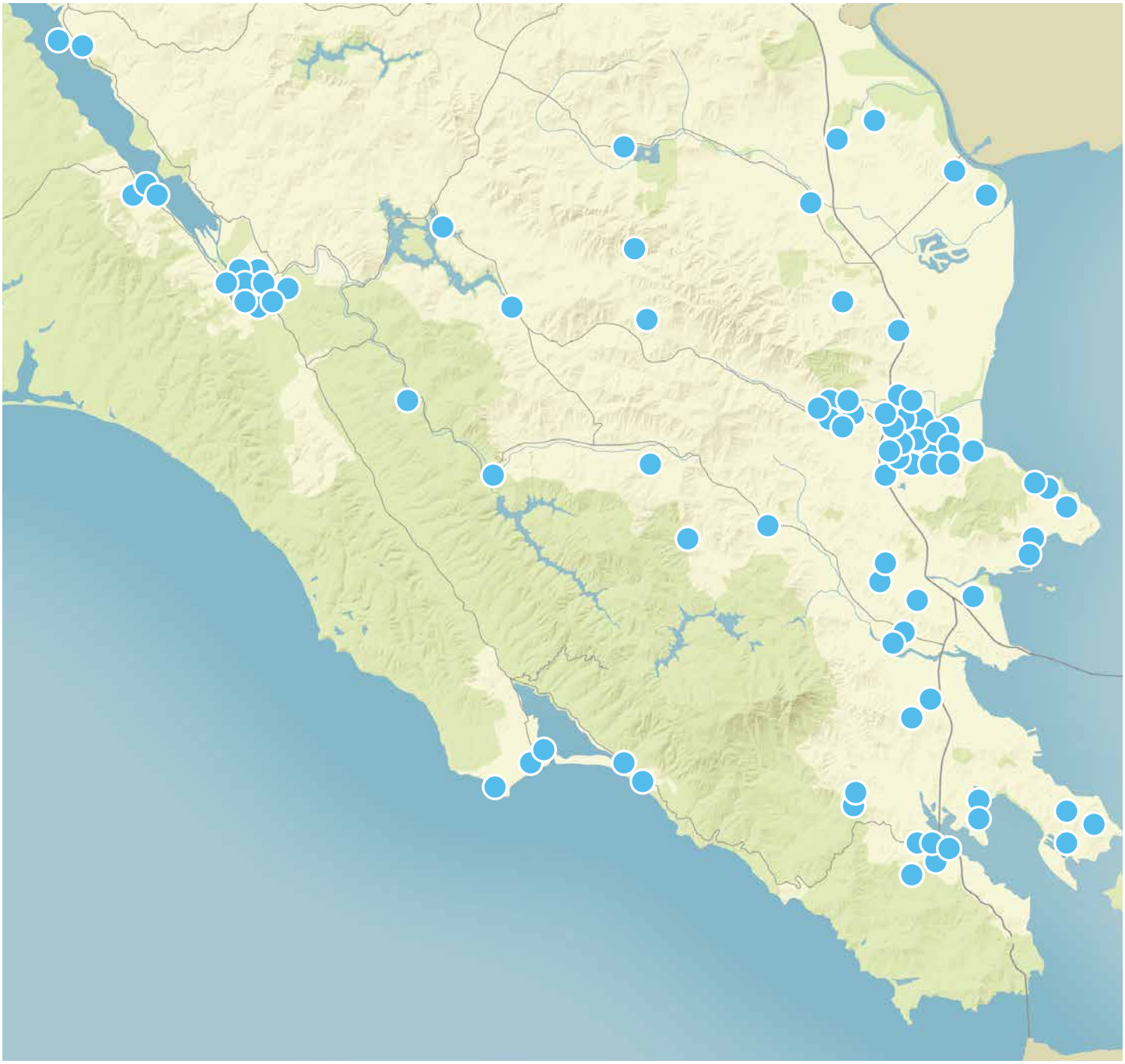
Marin County's IPM policy applies to 148 sites that include county parks and libraries, Marin County government offices, Marin County Health and Human Services sites, County Service Areas, roadsides, and traffic medians throughout Marin. Common IPM challenges in these locations include wasps, ants, roaches, rodents, and weeds. In addition to managing pests, the county IPM program provides outreach to the public through volunteer opportunities and education.

The Integrated Pest Management Commission oversees the implementation of the Marin County Integrated Pest Management ordinance and policy. The nine-member Commission also advises and makes recommendations to Marin County's IPM Coordinator and the County Board of Supervisors as needed. Commission meetings are held quarterly and are open to the public, who are encouraged to participate via public comment in addition to direct communication with program staff.

One of the sites that the Marin County IPM program cares for is the The Marin County Civic Center campus.

2023 Locations

In 2023, Parks staff, contractors, and volunteers maintained 148 locations, including 136 without pesticides.



County ordinance 3598 governs IPM for parks, libraries, fire stations, office buildings, traffic medians, other buildings, and ornamental landscapes on county properties across Marin. The Marin County Open Space Preserves are governed by the Parks and Open Space Commission and the Open Space District Board of Directors. They are not covered in this report. Visit parks.marincounty.org to view the Vegetation and Biodiversity Report and Work Plan for more information on IPM in the preserve system.

2023 Volunteers & Employees

In 2023, volunteers contributed 8,558 hours in support of non-chemical IPM, equivalent to over 4 full-time employees.

Marin County Parks owes much of its success to volunteer programs, which allow the department to complete many projects with the help of the local community. Each year, parks landscaping projects involve hand-weeding, mulching, flaming, and weed-whipping in order to maintain a variety of common weeds. Litter cleanup helps to prevent rodents, yellow jackets, raccoons, cockroaches, and flies from thriving in county operated structures, and parks and picnic areas, in addition to helping to create a healthier watershed.

The Marin County Parks community of volunteers make it possible to successfully manage our parks, playgrounds, and picnic areas without herbicides. They receive and provide education related to IPM, and perform services including trash cleanup, sheet mulching, hand-pulling, weed whipping. Above, this Mill Valley school group participated in a Russian thistle removal event.

2023 Labor Hours

Overall IPM labor hours increased by 8% in 2023.

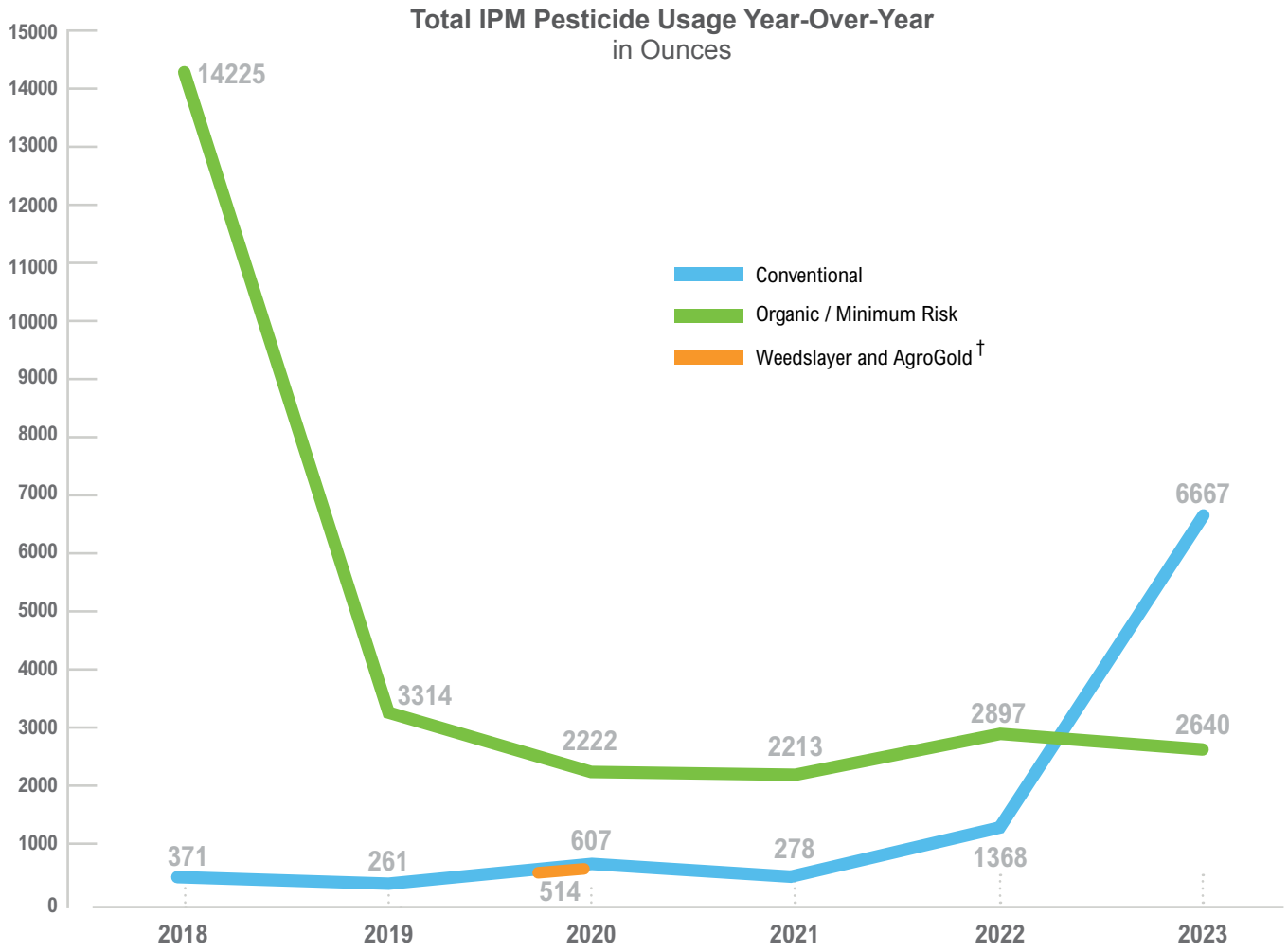
Labor Hours Year-Over-Year

Year	Staff IPM	Volunteer IPM	Contractor IPM	Total Hours	% Change Total
2015	20,718	7,983	8,687	37,388	**+22**
2016	26,888	7,086	8,808	42,782	**+14**
2017	25,052	9,439	8,542	43,033	**+0.6**
2018	21,970	10,766	10,563	43,299	**+0.62**
2019	23,328	11,694	11,232	46,254	**+7**
2020	22,259	11,889	11,891	46,038	**-0.5**
2021	18,541	9,333	11,376	39,250	**-17**
2022	14,738	9,293	9,534	33,564	**-14.5**
2023	17,367	8,558	10,450	36,375	**+8.37**

The County maintains a strong commitment to Integrated Pest Management that emphasizes non-chemical, least toxic methods. Mechanical and manual weed removal, sheet mulching, mowing, trapping, turf aeration, irrigation system improvements, and other site modifications are used in combination to help control various pest populations.

Total Pesticide Use

In 2023, the total amount of conventional pesticide use increased and organic/minimum risk* pesticide use decreased.



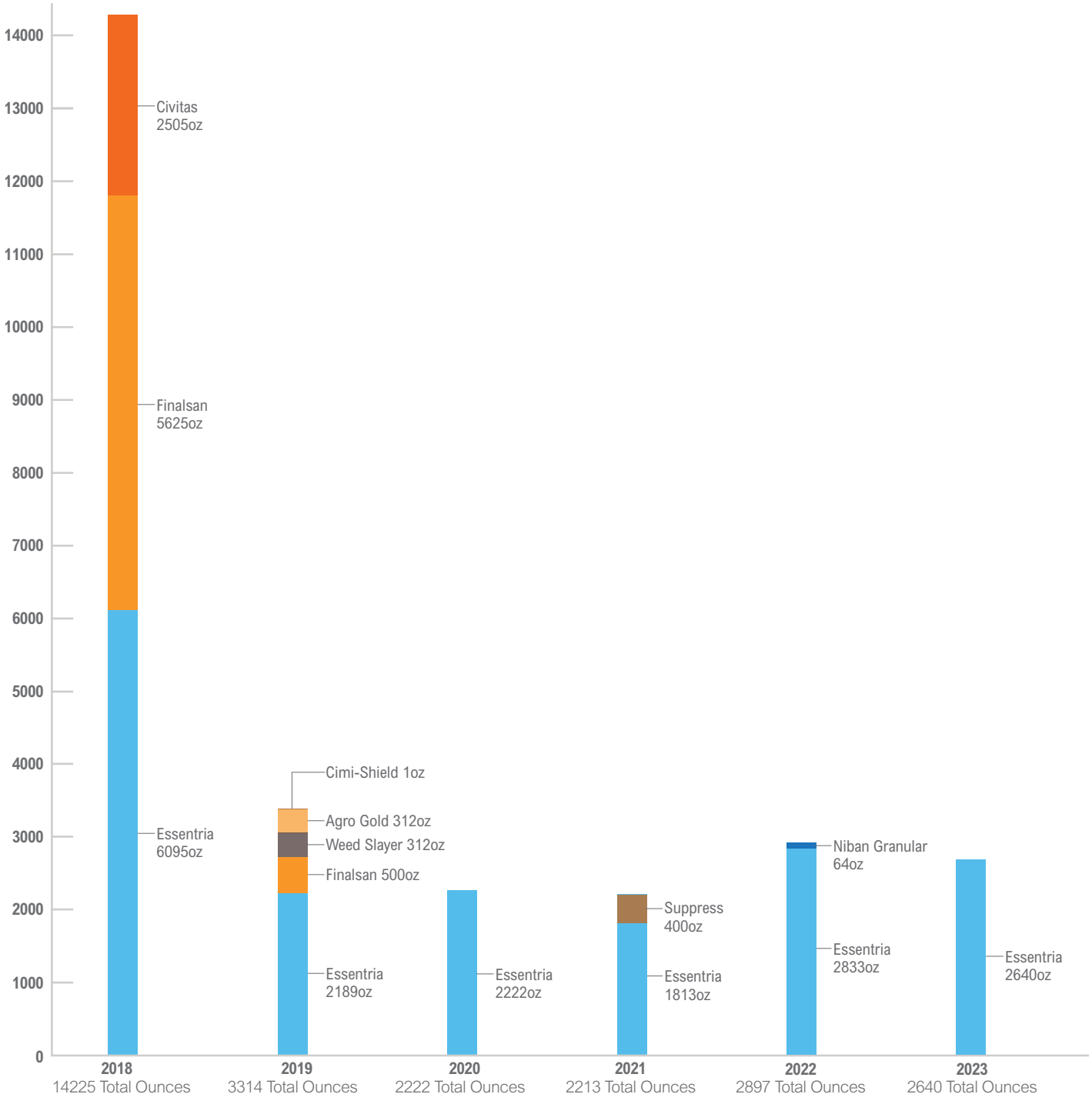
Conventional pesticide use increased in 2023, while organic pesticide stayed about the same. The increase in conventional applications is due to a single application of Reliant, a phosphorus-based product that was used to treat heritage oaks in Greenbrae with the goal of preventing the progress of sudden oak death. IPM will vary each year based on the types of pests, risks, and conditions in the field.

* *Product verified by the Organic Materials Review Institute (OMRI) to meet federally-regulated organic standards used by certified organic food and fiber producers, or is exempt from EPA registration by qualifying for the FIFRA 25B Minimum Risk ingredients list (aka "Eco-Exempt").*

† *At the end of 2020, WeedSlayer was removed from the list of "Minimum Risk" (FIFRA25B) pesticides, and all use was immediately halted. Because of this change, WeedSlayer was removed from these calculations and is displayed separately from organic and conventional products.*

Organic/Minimum Risk Pesticide Use

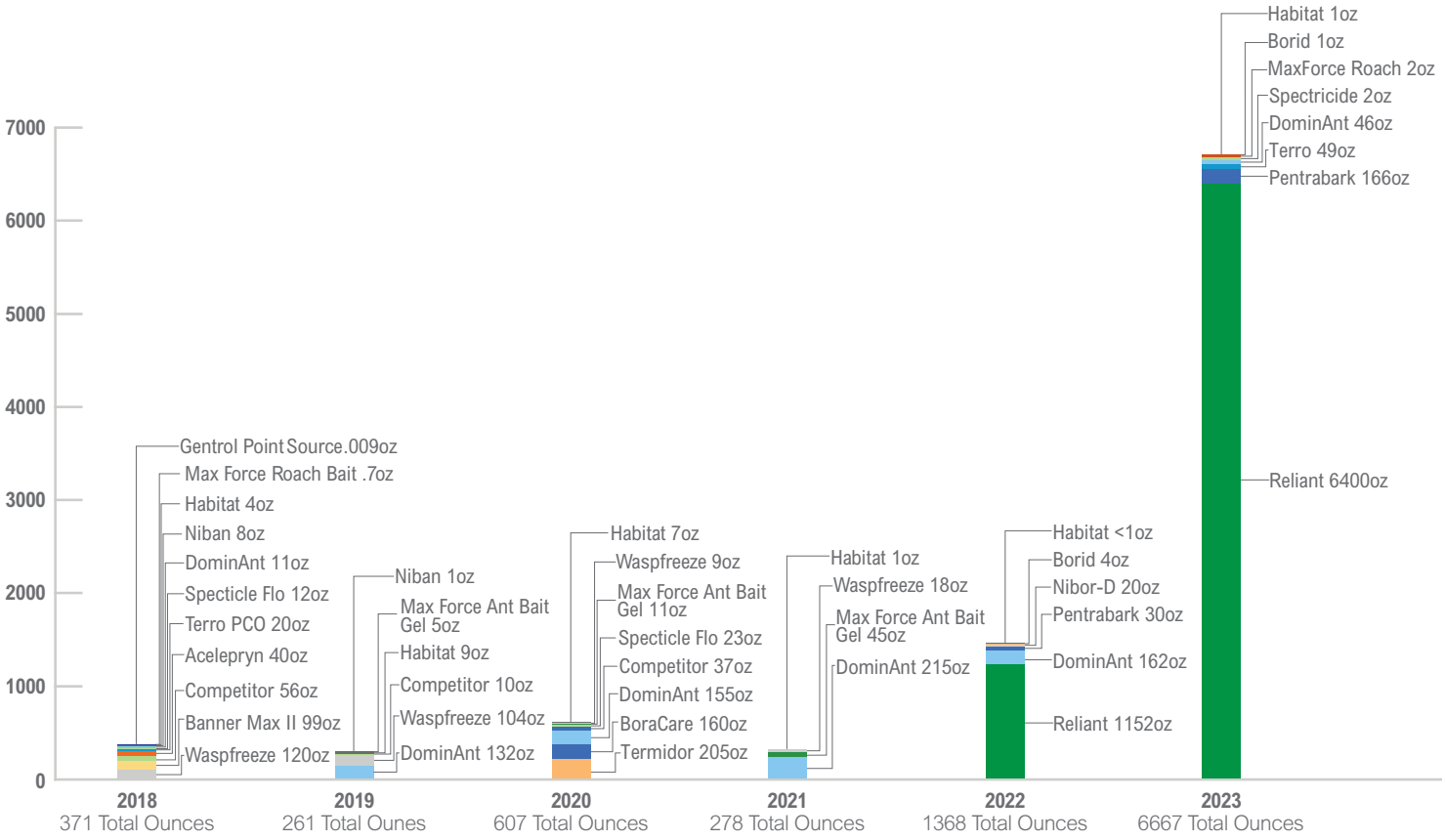
Use of organic pesticides decreased slightly in 2023.



The only organic pesticide used in 2023 was Essentria, which is derived from common plant oils, and is sprayed outside building perimeters of select county buildings on a quarterly basis, to act as a repellent for crawling insects such as ants, spiders, and cockroaches. Some variability year after year is to be expected with FIFRA 25B products that are sprayed in larger quantities, and is within the appropriate range for sites of this size.

Conventional Pesticide Use

Use of conventional products increased in 2023 due to efforts to protect heritage oaks.



The increase in conventional applications is due to a single application of Reliant, a phosphorus-based product that was used to treat heritage oaks in Greenbrae with the goal of preventing the progress of sudden oak death. Reliant was mixed with Pentrabark, which allows the pesticide to penetrate the bark more effectively. Refer to "Conventional Pesticides Applied in 2023" on page 10 of this report for detailed summaries of each product used. The other most commonly used conventional pesticides on IPM sites are small ant bait stations filled with boric acid, and are the same product commonly used in households to manage ants.

Information from previous years and the full list of allowable organic and conventional pesticides is available at parks.marincounty.org.

Organic Pesticides Applied in 2023

Organic and minimum risk* Products Used for Indoor Structural Pest Control

Essentria IC 3 is an insecticide with active ingredients comprised of rosemary oil, geraniol, and peppermint oil. When applied to the perimeter of a building, this product can prevent insect pest problems from affecting structures. This product was used at Gnoss Field Airport, Lucas Valley Field Office, Marin Civic Center Campus, the Marin Health and Wellness campus, Juvenile Hall, Novato Public Library, and the Marin County Social Services building.

Organic and minimum risk* Products Used for Landscape Pest Control

No organic/minimum risk pesticides were used on county landscapes in 2023.

** Product verified by the Organic Materials Review Institute (OMRI) to meet federally-regulated organic standards used by certified organic food and fiber producers, or is exempt from EPA registration by qualifying for the FIFRA 25B Minimum Risk ingredients list (aka "Eco-Exempt").*

View current Landscape Allowed and Structural Allowed Product Lists on the IPM webpage.

Conventional Pesticides Applied in 2023

Conventional* Products Used for Outdoor Landscape Maintenance

Habitat, an herbicide with active ingredient imazapyr, is formulated specifically for aquatic and riparian areas. It is used in spot treatment as part of the Bay area wide invasive Spartina project. Only 1 oz was applied this year to Hal Brown Marsh as part of the final stages of the battle against *Spartina densiflora*.

Pentrabark is a surfactant with active ingredient polyethylene glycol. It is a substance that is sprayed on tree trunks, allowing pesticide to penetrate the bark more effectively. More effective penetration allows for the same results with less pesticidal product compared to applications without Pentrabark. Increasing the amount of product that penetrates bark decreases the amount of product that runs off into the landscape. It was used to treat a limited number of heritage oak trees for *Phytopthera ramorum*, aka Sudden Oak Death, in Greenbrae (CSA 16).

Reliant is a product with active ingredient phosphoric acid. It was used to treat a limited number of heritage oak trees for *Phytopthera ramorum*, aka Sudden Oak Death, in Greenbrae (CSA 16).

Spectricide was applied at Corte Morada Park and Alamenar Drive to treat wasps. See "Violations and Exemptions" on page 11 for more information.

Conventional* Products Used for Indoor Structural Pest Control

Borid also uses boric acid and was applied to manage cockroaches at the Novato library.

DominAnt also uses Orthoboric acid and was used to aid controlling ants and other crawling insects at multiple structural sites including the civic center interior and Gnoss Field buildings. This product uses borax as its active ingredient and was used in protected bait stations.

Maxforce FC Roach Gel is a product used to control German or brown-banded cockroach populations in structures. Cockroaches are only managed in areas where they are a nuisance or threat to human health. This product, which is housed inside a bait station, was applied twice in 2023 at Marin Health and Wellness.

Terro PCO also uses boric acid and was used to aid controlling ants and other crawling insects at multiple structural sites. This product uses borax as its active ingredient and was used in protected bait stations.

** Conventional pesticides are pest control substances or mixtures that are generally produced synthetically. If a product has not been verified by the Organic Materials Review Institute (OMRI) to meet federally-regulated organic standards, or is not on the EPA's FIFRA 25B Minimum Risk ingredient list (aka "Eco-Exempt"), the Marin County IPM program lists it as "conventional."*

View current Landscape Allowed and Structural Allowed Product Lists on the IPM webpage.

Violations and Exemptions

Violations

County Ordinance 3598 governs the Marin County IPM program. Any events that differ from the policies laid out in the ordinance are considered violations.

There was one violation of the Marin County IPM policy in 2023. Two ounces of SPECTRACIDE – EPA #9688-190-8845 were applied at Corte Morada Park and Almenar Drive on June 29th, 2023. This product was applied because a wasp nest was putting contractors on that site at risk. The contractor was instructed that, in the future, there is a different product that may be used and is listed on our allowed products list. If the allowed product is not available at the time or location of the wasp nest, contractors are instructed to leave the site and return when the allowed product has been acquired.

Exemptions

A product that is not on the list of allowable pesticides may be approved for a specific and limited purpose by the IPM coordinator. These are considered limited-use exemptions.

On July 13, 2023, an exemption was approved for PT **Waspfreeze II**, active ingredient Prallethrin, an insecticide used to treat yellow jacket nests in park, playground, and picnic areas. This product was not used in 2023.

On August 17, 2023, an exemption was approved for **Habitat**, active ingredient Imazapyr, to treat spartina species at Creekside Marsh. Less than one ounce of this product was used in 2023.

Proposed Changes to the Allowed Products List 2023

There are currently no suggested product removals in 2024.

Changes to Two Product Classifications

Two products currently on the Allowed Product List will be reclassified as a part of the California Groundwater Protection List (column J).

Heritage is the name of a fungicide that has not been used at any IPM sites in recent years. The active ingredient, Azoxystrobin, is included on the California Groundwater Protection List.

Spectacle Flo is an herbicide that was last used in 2020. The active ingredient, Indaziflam, is included on the California Groundwater Protection List. Because any products on the California Groundwater Protection List must be considered “special use,” Spectacle Flo has been moved from “regular use” category to the “special use” category. Regular use products are in greater alignment with IPM policy goals, and are considered preferred products.

The 2024 Allowed Products list will be updated to reflect these changes. More information can be found at the California Department of Pesticide Regulation website.

Marin County Parks IPM Team

Jim Chayka

Parks and Open Space Superintendent, Integrated Pest Management Program Coordinator

Jim Chayka has worked for 20 years in the fields of natural resource management, watershed restoration, and environmental stewardship. Prior to joining Marin County Parks, Jim served as Director of Natural Resources at Conservation Corps North Bay—a regional program dedicated to developing and engaging youth through environmental stewardship. As a consultant with Watershed Sciences and the Urban Creeks Council, Jim spent 10 years as a fluvial geomorphologist supporting research and restoration efforts throughout Bay Area watersheds. Jim has also held leadership positions with Fire Safe Marin, East Bay Conservation Corps, the Student Conservation Association, and the Sonoma Ecology Center.

Jim holds the following degrees, licenses, and certifications: a BA in Political Science and a MS in Geosciences; Parks and Recreation Professional (CPRP) certification through the National Recreation and Parks Association; C-27 Landscape Contractors License; Qualified Stormwater Pollution Plan Developer & Practitioner (QSD/QSP); Certified Professional in Erosion and Sediment Control (CPESC).

Katherine Knecht

Integrated Pest Management Specialist and Senior Program Coordinator

Katherine joined the IPM team in February 2021, bringing experience with education programming, habitat restoration planning, and volunteer coordination. After growing up in Novato, she obtained a B.S. in Environmental Studies with an emphasis on ecological systems and habitat restoration from UC Santa Barbara. Her graduate thesis focused on salmonid habitat restoration project planning on the Columbia River, which was accompanied by work managing Japanese knotweed in Clark County Washington. In 2015, she worked as a program coordinator and educator at an outdoor and environmental education facility and is thrilled to have the opportunity to bring these skills and experience home to serve Marin County as IPM specialist.

Kirk Schroeder

Volunteer Program Coordinator

Kirk Schroeder has worked at Marin County Parks for over 20 years, and has over a decade of experience organizing volunteers. In his current role he coordinates volunteers to support non-chemical IPM in County parks, multiuse pathways, and other landscape service areas. He began his career as a seasonal extra-hire and moved up to Park Ranger and Supervising Ranger positions. Kirk graduated from University of California, Santa Cruz with a bachelor's degree in Fine Art, and is a certified professional lifeguard.

Glossary

Active Ingredient. An active ingredient is the part of a substance or compound that produces its chemical or biological effect. In Integrated Pest Management, it is the ingredient that prevents, destroys, repels, or mitigates a pest, or is a plant regulator, defoliant, desiccant, or nitrogen stabilizer.

Biological Control. A method of controlling pests using natural enemies such as predators, parasites, pathogens, and competitors. An example of biological control is releasing green lacewings to control aphids.

Conventional Pesticide. Pest control substances or mixtures of substances that are generally produced synthetically. Synthetic products are made by a synthetic or chemical process by human origin as opposed to occurring naturally. To avoid confusion with organic standards, the Marin County IPM program lists all non-OMRI verified pesticides as "conventional" even if the active ingredient is naturally occurring.

Cultural Control. A method of controlling pests by changing work practices to reduce pest establishment, reproduction, dispersal, and survival. Changing irrigation practices to reduce the amount of root diseases and weeds is an example of cultural control.

Fungicide. A substance or preparation used to kill fungi, including blights, mildews, molds, and rusts.

Herbicide. A substance or preparation used to kill weeds and other plants that grow where they are not wanted.

Insecticide. A substance or preparation used to kill insects and other arthropods.

Integrated Pest Management (IPM). An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism. Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and nontarget organisms, and the environment.

Mechanical Control. The management and control of pests using physical means such as weeding, mowing, fences, or barriers.

"Minimum Risk" aka Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 25(b) The EPA has exempted certain products from federal registration. This designation is sometimes referred to as "minimum risk." However, these products are subject to registration by individual states. Products that are on this list must meet a series of requirements, which limit the ingredients that can be allowed. It is required that these products list all active and inert ingredients on the product label.

Organic Materials Review Institute (OMRI). A 501(c)(3) nonprofit organization providing organic certifiers, growers, manufacturers, and suppliers an independent review of products intended for use in certified organic production, handling, and processing.

Organic Pesticide. Pest control substances or mixtures of substances that are compliant with USDA National Organic Program standards. In the United States, the term "organic" is federally regulated and governed by standards in the Code of Federal Regulations when used on food or fiber products. When the Marin County IPM program uses the term "organic," it refers to pesticides verified by OMRI to meet federally-regulated organic standards used by certified organic food and fiber producers.

Pest. Pests are organisms that damage or interfere with desirable plants in fields and orchards, landscapes, or wildlands, or damage homes or other structures. Pests also include organisms that impact human or animal health. Pests may transmit disease or may be just a nuisance. A pest can be a plant (weed), vertebrate (bird, rodent, or other mammal), invertebrate (insect, tick, mite, or snail), nematode, pathogen (bacteria, virus, or fungus) that causes disease, or other unwanted organism that may harm water quality, animal life, or other parts of the ecosystem.

Glossary

Pesticide. A pesticide is any substance or mixture of substances intended for: preventing, destroying, repelling or mitigating any pest; use as a plant regulator, defoliant, or desiccant; or use as a nitrogen stabilizer. Fungicides, herbicides, insecticides, and rodenticides are all types of pesticides.

Pesticide Precautionary Statements. Written, printed, or graphic matter which provide the pesticide user with information regarding the toxicity, irritation and sensitization on hazards associated with the use of a pesticide as well as treatment instructions and information to reduce exposure potential.

Pesticide Product Label. The written, printed, or graphic matter on, or attached to, the pesticide or device or any of its containers or wrappers. It provides critical information about how to safely and legally handle and use pesticide product. Unlike most other types of product labels, pesticide labels are legally enforceable, and all of them carry the statement: "It is a violation of Federal law to use this product in a manner inconsistent with its labeling."

Pesticide Toxicity Category. The EPA established four Toxicity Categories for acute hazards of pesticide products, with "Category I" being the highest toxicity category. Acute toxicity studies examine a product's toxicity as it relates to six different types of exposures (acute oral, acute dermal, acute inhalation, primary eye irritation, primary skin irritation, and dermal sensitization). The product is assigned a toxicity category (I–IV) for each type of exposure based on the results of five of the six studies.

Rodenticide. A substance or preparation used to control mice and other rodents.