

Vegetation Management Annual Report



Sonoma County, Sonoma County Ag + Open Space, Sonoma County
Community Development Commission, and Sonoma Water

Fiscal Year 2020/2021

November 2021

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Santa Rosa, CA 95403

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1. Introduction

On June 4, 2019, the Sonoma County Board of Supervisors (County), the Board of Directors of the Sonoma County Water Agency (Sonoma Water), the Board of Directors of the Agricultural Preservation and Open Space District (Ag + Open Space), and the Board of Commissioners of the Community Development Commission (CDC) adopted concurrent Resolution 19-0246 prohibiting the use of synthetic pesticides in sensitive areas and launching a transparent reporting program for pesticide use. This included a mandate to revise current IPM policies and establish areas of “no synthetic spray.”

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. IPM policy is 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 practice, and use of resistance varieties. A holistic IPM technique can lessen the need for pesticides.

IPM is a decision-making process for managing pests, which uses pest monitoring to determine if pest injury levels warrant treatment. If so, the treatment combines biological, cultural, mechanical, physical and/or chemical tools and other management practices to control pests in a safe, cost effective and environmentally sound manner that contributes to the protection of public health. This method uses extensive knowledge about pests, such as infestations, thresholds, life histories, environmental requirements and natural enemies to complement and facilitate biological and other natural control of pests. IPM involves the use of non-chemical pest control methods and the careful use of least-toxic chemical methods when non-chemical methods have been exhausted or are not feasible. When IPM is properly implemented, chemical controls are used only as a last resort. They are used as spot treatments and are chosen and timed to have the smallest negative impact on non-target organisms and the environment. All pesticides used by Sonoma County are registered with the U.S. EPA as required by Title 3 California Code of Regulations Section 6627 and reported to the (DPR) unless specifically exempt.

IPM applies to any pest including animals such as rodents or wasps, fungi such as mold, or other pathogens such as *Phytophthora quercina* which causes Sudden Oak Death. The vast majority of the County’s pest management activities apply to vegetation and weeds, however some departments conduct pest management other than weeds as addressed in this report.

In addition to managing pests, the IPM program provides outreach to the public through volunteer opportunities and education. Consistent with the Resolution, Sonoma County, Sonoma Water, Ag + Open Space, and the Community Development Commission prepare an annual report of pesticide use by these agencies. This document is the annual report combining the work of these agencies.

2. State Department of Pesticide Regulation Pesticide Reporting Requirements

The California Department of Pesticide Regulation (DPR) requires reporting of pesticide use in California for qualifying situations. As related to use by Sonoma County, Sonoma Water, Ag + Open Space, and the Community Development Commission, some uses are required to be reported to DPR, some are not. All agricultural uses are required to be reported; for the County of Sonoma, Regional Parks applications to parks, Ag + Open Space's applications to open space, rangeland, etc. and Transportation and Public Works (TPW) applications to roadsides are all considered agricultural uses. For these applications the departments/agencies or their contractors submit records to the Sonoma County Department of Agriculture/Weights & Measures (AWM) which then forwards the data to DPR. Additionally, a pest control business must submit a record of any application of pesticides (either on agricultural land or for structural use) to AWM who forwards them to DPR. The use is all reported on a monthly basis. Some uses are not reportable to DPR. This includes applications in an institutional setting (landscaping around government buildings) or applications of materials considered exempt from registration. These are materials that are generally regarded as safe and specifically listed by DPR. Examples of these exempt materials are cinnamon oil, clove oil and rosemary oil.

The County has tracked its pesticide use since 2007. Much of the initial reporting was glyphosate as this is of particular concern to the public. Glyphosate is a broad-spectrum systemic herbicide and crop desiccant. It is a compound used to kill weeds, especially annual broadleaf weeds and grasses. Glyphosate is the active ingredient in products such as Round Up and Aquamaster. Trends in pesticide use are shown in Figure 1 with similar tracking of glyphosate mirroring the trend of overall pesticide usage.

Herbicide use varies from year to year depending on weather, time, targeted weeds, new invaders, and new managed lands. In 2019, Sonoma County, and Sonoma Water, reviewed and updated IPM policies. In general, the use of herbicide including Glyphosate is decreasing on land managed by Sonoma County, Sonoma Water, Ag + Open Space, and the Community Development Commission. In future years, the newly adopted IPM policies, the implementation of no-synthetic spray zones, the use of non-synthetic chemicals, and ongoing manual or mechanical weed treatments will all impact the amount of herbicide use.

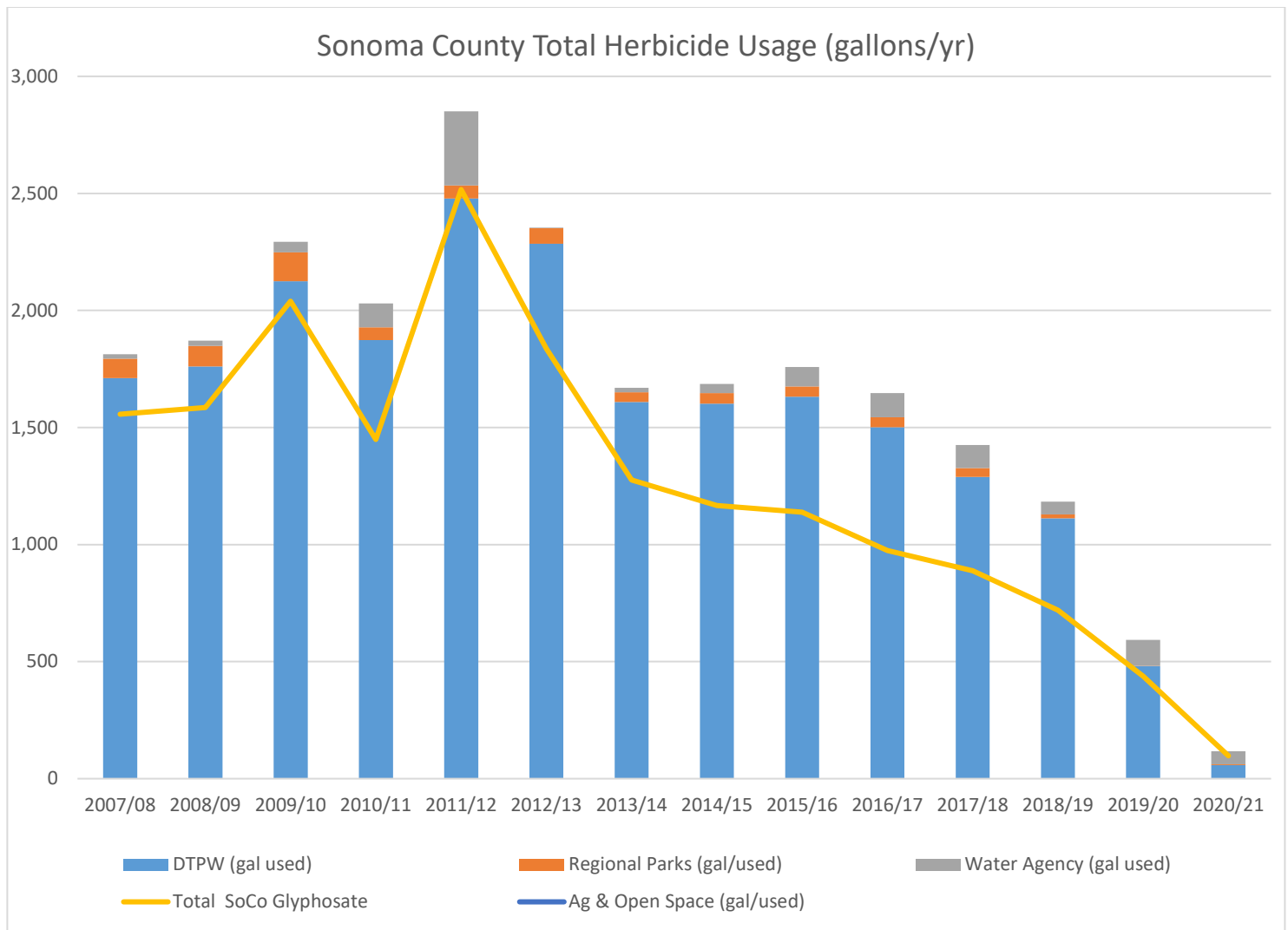


Figure 1 - Trend of Total Herbicide Use

3. 2020/2021 Vegetation Management Summary

Since the adoption of Resolution 19-0246 in June 2019, use of herbicides, including glyphosate, has decreased significantly by Sonoma County, Sonoma Water, Ag + Open Space, and the Community Development Commission. This is primarily due to the development and implementation of IPM plans and related policies, emphasizing the use of physical, biological, and mechanical controls over the use of chemical controls and establishing a policy that using chemicals for vegetation management should be implemented on a limited basis and when no other alternative is deemed feasible.

Prior to the adoption of Resolution 19-0246, herbicide use by Sonoma County, Sonoma Water, Ag + Open Space, and the Community Development Commission totaled 1,184 gallons (2018/2019 fiscal year). During the 2019/2020 fiscal year, herbicide use was 596 gallons, nearly half of the use to the year prior. In this reporting period, total herbicide use is 120 gallons, nearly an 80% reduction.

While IPM practices and related policies have reduced the overall use of herbicides, the use of herbicides continues to be a necessary practice, even on a limited and reduce basis. The amount of herbicide use will continue to vary year-to-year and between departments. Report use for 2020/2021 is abnormally low due to COVID -19 restrictions and drought conditions. Each agency's staff expects higher use levels as COVID-19 restrictions are lifted and in high rain fall years.

4. Department/Agency Specific Vegetation Management Reports

4.1. Ag + Open Space

Properties owned by Ag + Open Space ('fee lands') are managed to preserve and enhance the health of natural ecosystems, paying particular attention to sensitive resources and habitats. Ag + Open Space maintains each property to protect the ecological health and conservation values of each property, in accordance with the original intent of its acquisition, until the property is conveyed to a new owner. Ag + Open Space does not intend to own and manage properties beyond the sunset of the agency's sales tax measure, but instead will convey fee title interest to other responsible entities for long term management while retaining a conservation easement interest in each property.

Ag + Open Space collaborates with partner agencies and organizations to coordinate and plan regional-scale natural resource management, apply for shared funding, and gather and share the best available spatial data and local expertise to support natural resource management planning and project implementation throughout the County. Ag + Open Space manages vegetation on its fee lands primarily through mowing, understory thinning and prescribed burning, removal of invasive species, native plant revegetation, and grazing.

Annual mowing typically occurs around structures and parking areas, along internal and access roads and the property perimeter if appropriate, and in areas where mowing is the preferred method for invasive species removal. Mowing only occurs after Ag + Open Space staff or a qualified consultant conducts a nesting bird survey in the area to be mowed to ensure no birds or nests are present. If nesting birds are present, an appropriate buffer zone is established, and mowing is postponed within this zone until the birds fledge and leave the nest.

Ag + Open Space utilizes understory thinning and the creation of shaded fuel breaks as tools where appropriate to reduce fuel loads while also enhancing habitat for native plants and animals. Shaded fuel breaks are typically developed along existing roads and are planned in coordination with Cal Fire to ensure their location is operationally effective and consistent with regional fuel break planning. Shaded fuel breaks retain overstory forest canopy while removing smaller understory material that may serve as ladder fuels and contribute to higher fire intensity. While they can be effective in slowing or stopping the spread of a non-wind-driven wildfire, their primary purpose is to allow safe access and appropriately prepared conditions for firefighting personnel to access an area for suppression activities or to use as a control line for a prescribed burn. Ag + Open Space works with Registered Professional Foresters and tribal, biological, and cultural resource consultants as needed to ensure shaded fuel breaks and other forest thinning activities are ecologically appropriate and avoid impacts to sensitive resources.

Ag + Open Space is planning to implement prescribed burns on some of its properties in coordination with Cal Fire. These activities are subject to permitting requirements from Cal Fire, the Bay Area Air Quality Management District, and other regulatory agencies. Prescribed burns are intended to improve native species composition and habitat, reduce hazardous fuels, control invasive species, and improve and maintain resiliency of natural lands to wildfire, climate change, and other extreme events. Significant public outreach and community and tribal involvement will be undertaken prior to any planned burn, and educational outings are planned in conjunction with prescribed burning to enable the community to learn about and observe the goals and effects of prescribed fire first hand.

4.1.1. Agricultural Use

Ag + Open Space leases out a portion of most of its properties for grazing or vegetable farming. The majority of leases are for grazing. Ag + Open Space uses grazing to support local agricultural producers, and as a tool to manage invasive plant species, reduce fuels, and enhance habitat for native plants and animals. Ag + Open Space has worked with a Certified Rangeland Manager to assess the grazing potential for all our fee lands. This assessment includes ranking the forage quality of the vegetation, evaluating access to the property, determining adequate stocking rates, recommending suitable livestock type, and advising on any need to limit grazing during particular seasons.

Unfortunately, some Ag + Open Space-owned properties are difficult to access, lack infrastructure and water supply, have low forage production, or are subject to constraints related to sensitive habitats and protected species. Because of this, large-scale or property-wide grazing may not be suitable on some properties. However, Ag + Open Space endeavors to make grazing leases available whenever appropriate and plans to expand the use of short-duration, seasonally timed prescriptive grazing for vegetation and fuels management on a property-specific basis. Ag + Open Space will continue to engage with partner agencies, non- governmental organizations, and consultants that have expertise in livestock grazing and adaptive management approaches.

4.1.2. Invasive Species

Ag + Open Space takes aggressive action to identify and manage invasive species populations on its fee lands, prior to transferring a property to the next owner for permanent conservation. Any invasive species occurrences observed during routine monitoring visits can be proactively managed in a manner tailored to the needs of each property. Control methods include but are not limited to: hand-pulling; seasonally timed mowing or grazing, including intensive rotational grazing; propane torch flaming during wet conditions; prescribed burning; and herbicide application. To the greatest extent possible, invasive plant control efforts are also designed to enhance habitat for native plants and animals and can include measures such as replanting with native vegetation to facilitate habitat restoration.

Ag + Open Space is committed to avoiding the use of synthetic pesticides in sensitive areas, and to support this commitment has compiled all known information regarding sensitive species and habitats that occur on its properties. Ag + Open Space implements an integrated approach in which synthetic pesticides are used conservatively and only as necessary, and Ag + Open Space will not use a synthetic pesticide unless: 1) there is no other option available to control an extreme infestation, 2) the environmental benefit is clear and outweighs the negative impacts of continued weed infestation, 3) only licensed professionals are involved in the application, 4) there is minimal risk of harmful exposure to humans or to sensitive resources, and 5) the application is part of an intentional strategy to transition over time to alternative methods of invasive species control such as mechanical removal, grazing, or prescribed burning.

If it is determined that a synthetic pesticide is appropriate to use in a specific situation, all precautions are taken to minimize exposure beyond the target species. For example, if synthetic pesticides will be used near a road that may be accessed by authorized persons such as volunteer patrollers or Ag + Open Space contractors, signs are posted at either end of the treated area to identify the date of treatment, chemical name, and “no-entry” period per the product label recommendations. Staff works with licensed pest control advisors to select chemicals that are as narrowly specific to the target species as possible and that do not bio-accumulate in the environment, and treatment areas and

application methods that could introduce synthetic pesticides into streams and other aquatic systems are avoided.

In addition to invasive plants, Ag + Open Space also monitors and manages for other pest types, including pathogens and insects. Ag + Open Space staff and contractors follow protocols to prevent the spread of pathogens such as Sudden Oak Death, and work with contractors to remove and relocate hives without the use of chemicals.

In 2020, Ag + Open Space focused on the management and control of the following target invasive plant species on its fee properties.

Yellow Star Thistle

This noxious weed spreads aggressively into grasslands and disturbed areas once introduced, displacing native species and destroying agricultural forage potential. Ag + Open Space is managing yellow star thistle infestations on several of its preserves, including Calabazas Creek (transferred to Regional Parks ownership in 2021) and Saddle Mountain Open Space Preserves. At Calabazas, excellent progress has been made in reducing yellow star thistle since the beginning of herbicide treatments in 2009. Following the 2017 Nuns Fire, Ag + Open Space switched to a more integrated approach, combining prescriptive grazing and herbicide application to manage this species. Due to the timing of the property ownership transfer, Ag + Open Space was unable to undertake prescriptive grazing in 2021. Grassland monitoring data and planning documents for the previously planned prescribed burns in the preserve's starthistle-infested grasslands have been transferred to Regional Parks staff to support future prescribed burning and starthistle control efforts. At Saddle Mountain, yellow star thistle threatens the integrity of otherwise healthy native perennial grasslands, and staff has worked with a licensed contractor to conduct spot treatment with broadleaf-specific herbicide to keep the infestations in check until there can be a transition to a combination of prescribed burning, seasonal grazing, and hand-pulling. Fortunately, past treatments appear to have been highly effective and only minimal treatment was needed in the previously treated grasslands in 2021. Ag + Open Space will continue to target known yellow star thistle populations at Saddle Mountain for significant control or eradication now that these areas have burned in the 2020 Glass Fire.

Purple Star Thistle and Distaff Thistle

These two invasive thistles are present on the Keegan-Coppin and Oken properties. At Keegan-Coppin, the infestation is relatively limited and in 2021 spot treatment was applied with broadleaf-specific herbicide to check its spread. Ultimately, it is hoped that grazing and hand pulling will be adequate to control the existing invasive thistle populations on the property. The Oken property came into Ag + Open Space ownership with a severe, widespread infestation of these two invasives, which had drastically reduced the amount of forage available for the commercial grazing operation that the property supports under a lease agreement. 2021 was the eighth year of broadleaf-specific herbicide application on the property. At this point the thistle infestation has been greatly reduced and the agricultural functionality of the property much improved, with spot treatments and hand pulling rather than widespread boom spraying increasingly possible. It is hoped that one more widespread application may be needed in 2022, with a transition to spot treatment and other methods of control in the following years. Since the Oken property borders a residential neighborhood, annual neighbor outreach has been a component of the thistle control project. Neighbors who have responded to outreach materials have been supportive of the project and have

not expressed concerns that could not be addressed by further clarifying project details in follow-up conversations.

French Broom

Broom infestations are of particular concern due to this species' tendency to out-compete native vegetation and to increase fuel loading and associated wildfire risk. Ag + Open Space is actively managing French broom on the Calabazas Creek and Paulin Creek Open Space Preserves, using a combination of hand pulling and herbicide spot treatment each year as appropriate. French broom has a long-lived seed bank so it is anticipated that eight or more years of thorough annual control will be needed on both of these Preserves. A known French broom population burned in the Glass fire on our Saddle Mountain Open Space Preserve. Since fire typically stimulates a heavy broom seedling flush the following spring, Ag + Open Space plans to treat this area within the next two years, ideally with a non-chemical method such as propane flaming if practical.

Himalayan Blackberry

This species can be especially aggressive and problematic when it becomes established in riparian corridors, and can overtake pastures and grassland areas if not managed. In 2019, volunteers assisted Ag + Open Space staff in digging out Himalayan blackberry on our Dogbane Preserve, and contractors continue to work on the significant blackberry infestation on our Paulin Creek Preserve using a combination of digging, cutting, and follow-up herbicide spot treatment. At Calabazas Creek Open Space Preserve, a combination of manual removal, herbicide application, and replanting native species over the past ten years has decreased the infestation significantly, particularly at the trailhead and upper creek crossing. Significant infestations remain at our Oken property and at Saddle Mountain Open Space Preserve. Ag + Open Space will begin removing Himalayan blackberry within the riparian restoration areas at Oken in 2022, using a combination of mechanical removal and follow-up spot treatments intended to minimize use of chemical treatments. Since the 2020 Glass Fire burned away most of the above-ground material in the Himalayan blackberry infestation areas at Saddle Mountain, Ag + Open Space staff have worked with a licensed contractor to do a conservative spot-treatment of resprouting material in 2021.

Total synthetic herbicide use on Ag + Open Space-owned properties from July 1, 2020 to June 30, 2021 was 221 ounces, , primarily used for spot treatments. This included approximately 44 oz of glyphosate-based product. Note that these numbers describe the total volume of product used, not the total volume of active chemical within the product.

While eradication is the ideal goal of any invasive plant management project, all of the species discussed above require ongoing and often long-term efforts to control, as well as vigilance in detecting new infestations. Ag + Open Space is deeply committed to protecting the health and resiliency of our fee properties, and we understand adaptive management and the use of the least-toxic effective alternative as necessary corollaries to the care and protection of these lands and the plant, animal, and human communities that depend upon them.



Figure 2 - Ag + Open Space staff at Dogbane Preserve

4.2. Community Development Commission

4.2.1. Use of Insecticides

Property managers rely on licensed pest control companies to use their expertise to address known issues, especially those potentially effecting health and safety.

CDC reports no insecticide use on CDC owned and managed properties for FY 20-21

4.2.2. Use of Herbicides

In addition to measures that ensure safe and sanitary housing, the CDC is responsible for weed and other fire abatement measures. When practical, manual controls such as mowing and debris removal are employed. In certain cases, vendors used Round-Up, which was limited to small areas around the Russell Avenue property,

For FY 20-21 CDC reports the use of 32 ounces of Round-Up at the Russel Ave property.

The CDC is committed to the responsible good stewardship of agency owned and managed properties while working to ensure it meets the obligations of providing safe and sanitary housing, employing best practices at commercial properties, and effectively mitigating weeds and other pest and fire hazards. CDC is fully engaged with vendors in monitoring their use of pesticides and herbicides and use of the most suitable organic alternatives available and to further work on prevention measures to avoid issues from arising.

4.3. General Services

General Services Department (GSD) is committed to upholding the County's policies regarding employee safety, public safety, and protecting the environment. GSD maintains many County property assets and assists front line Departments in contracting for goods and services essential to fulfilling their respective missions. GSD forces do not directly perform grounds maintenance work. Instead, grounds maintenance work is performed under contract with services providers or done in conjunction with project development. All such work is required to be performed in compliance with herbicide and pesticide contract specifications and use criteria that were developed to reflect the Board's Resolution, and GSD strictly enforces the criteria through management and oversight of the applicable contract(s). GSD will continue to ensure that the County's "No Synthetic Spray" zone policies are reflected and adhered to as to all work, whether undertaken by County forces or by the department's maintenance or project contractors. With regard to the County Administrative campus, Probation Department's Supervised Adult Crews (SAC) perform all regular grounds maintenance work and have been adhering to a "No Synthetic Spray" directive at the campus since 2020.

4.4.Regional Parks

The Sonoma County Regional Parks Department (Regional Parks) manages over 16,000 acres across 66 parks, trails, and marinas throughout Sonoma County for natural resource protection and recreation. From multi-thousand acre working ranches to small neighborhood playgrounds and spanning from the Pacific Ocean to the Mayacamas Mountains and the baylands to the Mendocino County line, Regional Parks manages a vast range and diversity of landscapes that are emblematic of Sonoma County. Managing vegetation and biodiversity is an essential part of Regional Parks' mission and ensuring that Sonoma County Regional Parks and Open Space Preserves remain healthy and functional for future generations.

This section discusses the ongoing management of vegetation across the Sonoma County Regional Park system highlighting both the achievements, future actions, and challenges of vegetation management in Sonoma County Regional Parks.

Goals

- Report on ever expanding vegetation management
- Comply with our Integrated Pest Management Plan (IPM Plan)
- Achieve greater transparency of the use of pesticides
- Document trends in pesticide use over time

4.4.1. Expanding Vegetation Management

Invasive species are one of the most significant threats to natural resources. Along with the fragmentation of habitats, invasive species can have devastating effects on ecosystems and their functions including increased risk of wildfire, decreased water infiltration, decreased forage quality, and general decline of the beauty of natural landscapes. Leaving invasive species unchecked can both have dramatic economic and environmental costs.

Sonoma County has experienced significant wildfire over the last several years. Wildfire burn scars are at significant risk for invasive species colonization. These burn scars become locations of weed invasion, and if left untreated, the weeds then can become fuel for future fires. Broom species, for example, rapidly colonized after wildfires. In turn, Broom can also increase risk of future wildfire serving as a ladder fuel that can push ground fires into the crowns of existing trees.

Vegetation management goes beyond simply removing weeds and managing the invasive plants that "shouldn't be here." Vegetation management includes stewarding the native species that define the Sonoma County landscape such as Valley and Coast Live oak trees. Regional Parks works through an Integrated Pest Management (IPM) Plan to articulate action thresholds and treat pest species including weeds. Regional Parks uses a framework and philosophy called Early Detection and Rapid Response (EDRR) to set priority invasive species and map where they occur. Regional Parks deploys a number of strategies to control invasive species such as grazing, prescribed fire, and herbicide use.

Annually, Regional Parks staff vegetation management from mowing, weed whacking, construction of shaded fuel breaks, early detection and rapid response surveys for invasive species, and limited use of pesticides across 16,000 acres and 66 parks, trails, and marinas.

2020/21 actions:

- # acres mowed: Over 400 annually
- # acres of shaded fuel breaks constructed: 6.5

4.4.2. Pesticide Use

Regional Parks is committed to reduce the risk of exposure to toxins for both people and pets that use the County's parklands. Regional Parks is committed to eliminating the use of synthetic pesticides (of which herbicides are a subset) for routine, ongoing maintenance to control invasive weeds as well as eliminating the use of pesticides in playgrounds, parking lots, plazas, campgrounds, and other places where people and pets gather. Regional Parks maintains the use of synthetic pesticides to treat and control specific, targeted pest invasions when other means of control are inadequate and the consequence of non-action are significant. All pesticide use is reported to the Sonoma County Agricultural Commissioner.

Historically, glyphosate makes up the majority of synthetic pesticides used by Regional Parks or around 78% since fiscal year 2007/2008. With the relabeling of glyphosate and resulting discussions throughout the County, Regional Parks temporarily halted all use of all synthetic pesticide including glyphosate while the June 6, 2019 resolution was developed. As a result of the June 6, 2019 resolution, Regional Parks updated an Integrated Pest Management Plan (IPM Plan) and committed to eliminating the use of pesticides eliminating the use of synthetic pesticides for routine, ongoing maintenance and eliminated the use of pesticides in playgrounds, parking lots, plazas and campgrounds.

Use of all pesticides including glyphosate are near record low with 4 gallons of pesticide applied throughout fiscal year 2020/2021 and no synthetic pesticides containing glyphosate. This represents an ongoing reduction in Regional Parks' historic use of pesticides and shift to using synthetic pesticides only on specific populations of problematic invasive weeds. Reduction to zero however, across the over 16,000 acres of parklands owned and operated by Regional Park is unlikely, and indeed undesirable, as some highly invasive weeds will require control beyond what can be achieved without chemicals. This is particularly true in parks that are vulnerable to invasion of weeds after wildfires.

Figure 3 illustrates Regional Park's pesticide use each fiscal year, starting in 2007/2008. This includes use of glyphosate (blue bars) and all other pesticides (maroon bars) by Regional Parks relative to acres managed (green line). Pesticide use is slightly higher than the all-time low of 2019/2020 but is still very low relative to the history of Regional Parks. Regional Parks temporarily took over management of Annadel State Park in fiscal year 2012/2013 causing the temporary increase and decrease in acreage.

Pesticide Use in Sonoma County Regional Parks is Extremely Low as Total Acreage Managed Continues to Increase

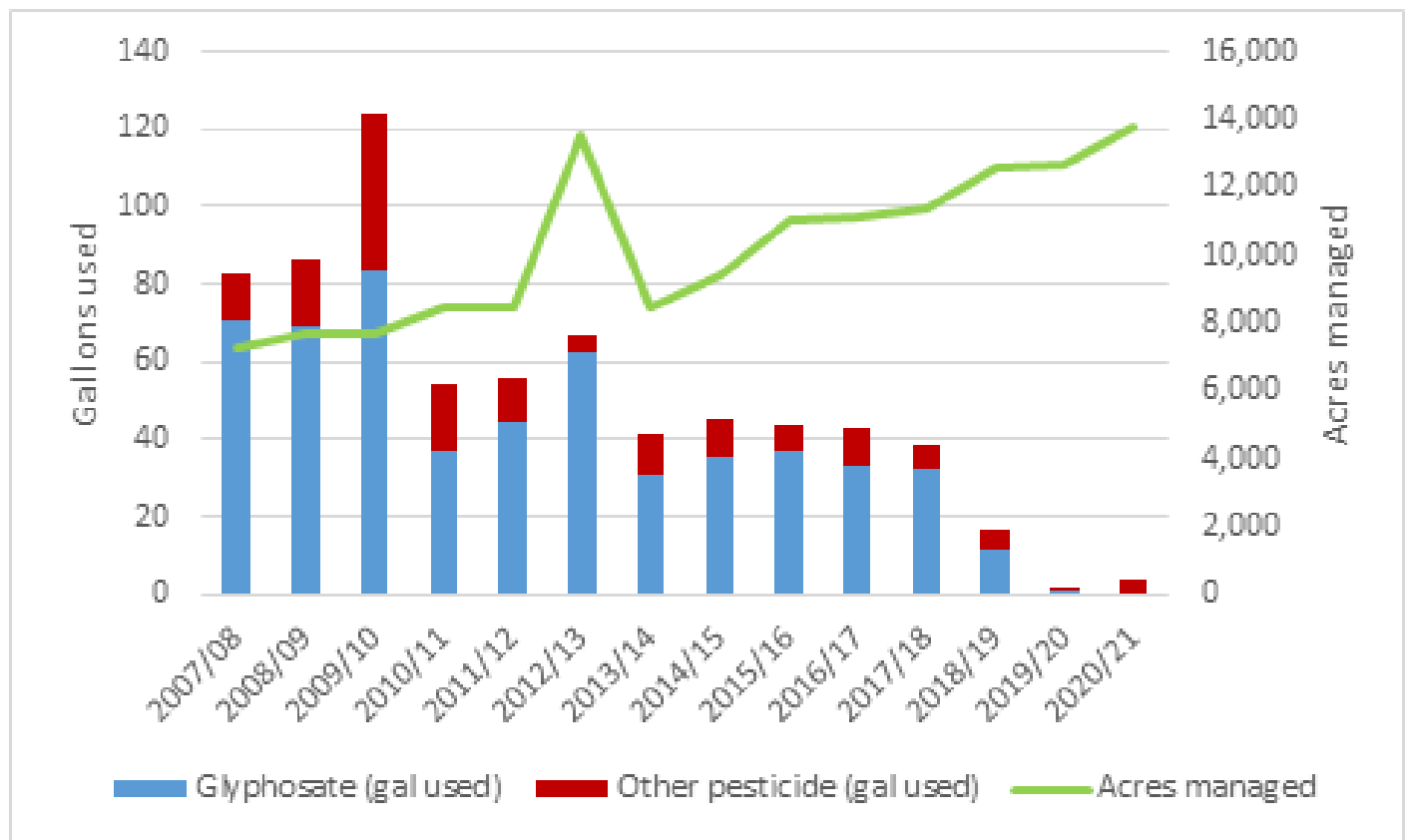


Figure 3 - Total Use of Pesticides

2020/21 actions:

- # Gallons synthetic pesticide used: 4
- # Gallons of glyphosate used: 0
- # Acres managed: 13,747 at the close of fiscal year 2020/2021; 16,275 acres at the time of report writing.

Future actions:

As Regional Parks maps and treats new weed invasions, acquires new lands, and invests in natural resource management, staff anticipate an increase in all strategies of IPM control: biological, cultural, mechanical, physical, and chemical control. Staff anticipate the use and training of staff in non-synthetic chemical treatments, but that some amount of synthetic herbicides will remain a part of Regional Parks' vegetation management.

4.4.3. Early Detection and Rapid Response

In FY 2018/19, Regional Parks piloted the first year of an EDRR program. While EDRR could be used for plants, animals, insects, pathogens, or any pest species, Regional Parks' efforts were limited to vegetative

weeds in areas of likely introduction such as trail corridors and parking lots. Regional Parks established a watch list of 65 different emergent invasive plant species for staff to survey for throughout the park system. Importantly, EDRR is not primarily a tool for treating invasive species that have become well established or naturalized in California such as Himalayan blackberry or any number of European grasses that dominate the grasslands of Sonoma County. The power of EDRR as a tool – inherent in its name - relies on early detection and rapid response to treat invasions before they become established. Therefore, not detecting any target weed species is just as valuable as detecting weed species and many of the 65 different priority weeds were not found. That said, new invasions of established weeds that are behaving as emergent populations were captured in our survey.

Crews surveyed trails for all 65 emergent invasive list weeds. During surveys, if any weeds were encountered, the crew mapped the population. If the weed could be controlled quickly, and with hand tools, the crew removed weeds by hand. If the invasion is too large or complex, crews simply mapped the weeds for future control.

Regional Parks uses a phone-based application called Weed Manager for mapping and tracking treatment of weeds. Developed by Calflora, Weed Manager is used by many area land managers including Marin County Parks, Midpenninsula Regional Open Space, and One Tam among others.

Throughout the fiscal year, a team of 4 staff members surveyed 32 parks mapping and treating both emergent invasives and emergent populations of established invasives.

2020/21 actions:

- # staff trained in Weed Manager phone mapping app: 3
- # parks surveyed: 14
- # observations: 1618

Future actions:

Regional Parks will continue to detect and treat invasive weeds with a focus on recent or emergent invasions of non-native species in high-value habitat.

4.4.4. Grazing

Grazing of public lands is a common practice throughout much of the nation and world. Grazing is an effective and efficient way to manage grasslands on a large scale to enhance biodiversity, reduce fire risk, and support local agriculture.

Grazing mimics the natural disturbance of large mammals such as bison or elk that used to dominate the Sonoma County landscape. Done correctly, grazing can benefit native biodiversity and improve habitat. Grazing animals are able to move over vast acreage as well as steep terrain that may be otherwise inaccessible for equipment such as mowers, however they require infrastructure such as fencing and water. Where fences have deteriorated over time, significant investment in fencing infrastructure is needed to contain grazing animals. Fencing also needs to remain as permeable as possible to wildlife. In combination with cross-fencing, proper and thoughtful development of water and distribution of water sources on the landscape can help distribute grazing animals on the landscape and manage vegetation.

In fiscal year 2020/2021, Regional Parks expanded grazing into Maxwell Farms.

2020/21 actions:

- # of parks grazed: 11
- # acres grazed: over 4600

Future actions:

As Regional Parks expands, managed grazing will include Wright Hill Regional Park and Open Space Preserve and over 1,200 additional acres of grazing.



Figure 4 - Sheep graze fuel breaks at Foothill Regional Park near Windsor, CA.

4.4.5. Collaboration

Regional Parks achieves vegetation management goals in part through collaboration with community members and groups. Regional Parks supports ongoing collaborations with a number of groups including the Laguna de Santa Rosa Foundation, the California Native Plant Society Milo Baker Chapter, Calfire, and others.

In the wake of the devastating fires of October 2017, Regional Parks joined 5 other land management and conservation organizations to better coordinate vegetation management in the Sonoma Valley area by forming the Sonoma Valley Wildlands Collaborative. Goals of the group include increasing resilience to wildfire and reducing risk to life and property within the wildland-urban interface

including communities of Oakmont, Kenwood, Glen Ellen, Bennet Valley, Eldridge, El Verano, Fethers Hot Springs, Agua Caliente, and Sonoma.

In early 2019, the Collaborative was awarded just over \$1 million in grant funding from Calfire to implement fuel reduction such as forest thinning, creation of shaded fuel breaks, and roadside vegetation removal to improve forest health, buffer communities from wildfire, and improve ingress and egress of evacuating residents and responding emergency personnel.

Future actions: Implementation of shaded fuel breaks is ongoing at Sonoma Valley Regional Park, North Sonoma Mountain Regional Park, and Hood Mountain Regional Park. The work of the Sonoma Valley Wildlands Collaborative will continue with plans to secure additional grant funding and continue to work across boundaries for great community protection.

4.4.6. Successful Grant Funding

Regional Parks continues to build success partnering with other agencies and non-profits to securing grant funding for vegetation management and natural resource protection. In partnership with other agencies and non-profits, Regional Parks was awarded:

1. Fire Prevention Grant (2019) from CALFIRE to expand the use of shaded fuel breaks in the Sonoma Valley Area to increase community protection and reduce wildfire risk. Implementation of this work is ongoing at Sonoma Valley Regional Park, North Sonoma Mountain Regional Park, and Hood Mountain Regional Park.
2. Fire Prevention Grant (2020) from CALFIRE to develop a forest management plan for Hood Mountain Regional Park, a park significantly impacted by frequent and intense fire.
3. Noxious Weed Program (2021) from the California Department of Food and Agriculture to support regional eradication of noxious and invasive weeds. Implementation of this work is ongoing.

2020/21 actions:

- # of active vegetation-related grants: 3

4.4.7. Case Study: Managing Stinkwort After Wildfire at Foothill Regional Park

Stinkwort *Dittrichia graveolens* is an invasive annual that is expanding in Sonoma County and California. Generally seen in disturbed areas like road edges and parking lots, it is rapidly invading wildlands particularly post-fire.



Figure 5 – Stinkwort, a pernicious fire follower, takes root in Foothill Regional Park following the Kincadee fire.

Prior to the Kincadee fire, Regional Parks staff detected five unique occurrences of Stinkwort at Foothill Regional Park. In the spring following the wildfire, staff detected Stinkwort throughout close to half the 200-acre park, particularly in areas of higher fire severity where native vegetation may be slower to recolonize. Staff pivoted to significant control efforts to treat the recent invasion, primarily pulling the weed by hand and eliminating the new growth before it was able to set seed. Rapidly detecting and treating this weed in the early stages of invasion is critical to maintaining the native diversity and habitat value of the park over the long term.

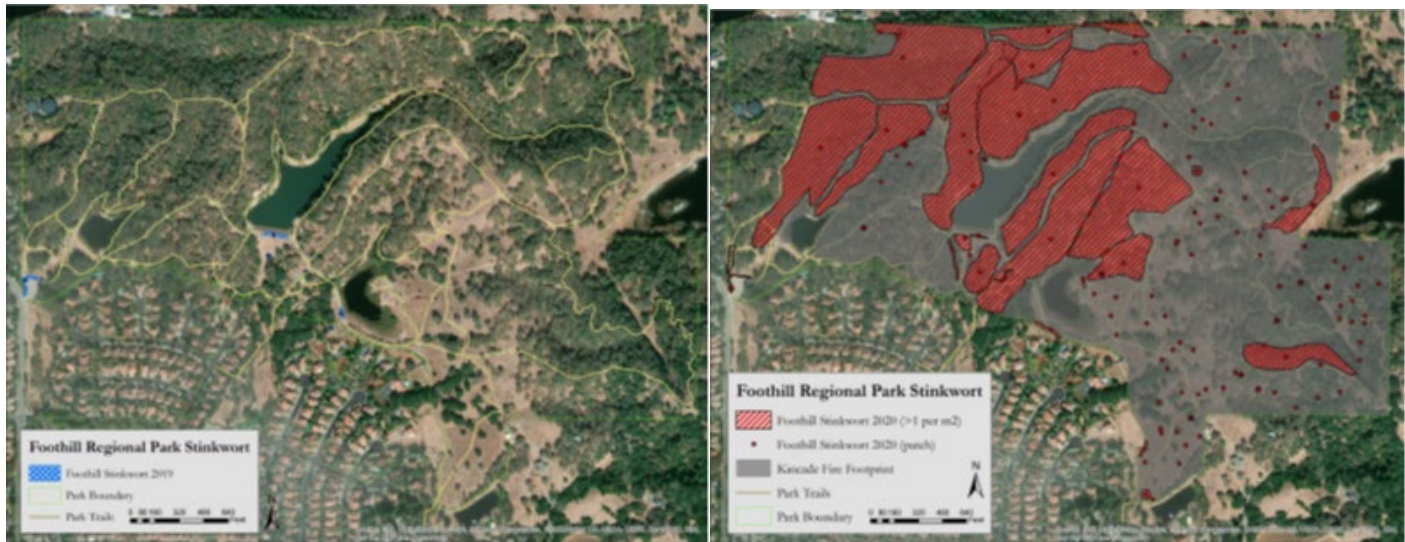


Figure 6 – Side-by-side images show the prevalence of Stinkwort pre-fire (left, blue) and post-fire (right, red) with extent of fire shown (grey, right).

4.5.Sonoma Water

Sonoma Water is responsible for maintaining buildings and facilities for water supply, flood control, and sanitation across Sonoma County. In addition, Sonoma Water manages approximately 75 miles of engineered flood control channels and 100 miles of modified or natural channels for flood water conveyance and habitat enhancement. Sonoma Water uses a range of methods to meet its ongoing flood management requirements, as well as safely maintain vegetation around its various facilities, while also meeting multiple objectives such as resource protection and environmental sustainability. These methods include sediment removal, bank stabilization, and various vegetation management activities such as hand and mechanical removal, grazing, and prescribed burning. Sonoma Water uses the minimum amount of herbicide necessary to control invasive plant species that are problematic for its water supply, wastewater, and flood control facilities.

The goal of Sonoma Water Stream Maintenance Program's is the development of a shaded canopy over the flood control channels to reduce invasive plant species. Generally, Sonoma Water removes unwanted vegetation by hand and with equipment, but may also employ selective herbicidal application. Sonoma Water uses herbicide to control invasive plant species that are problematic for its water supply, wastewater, and flood control facilities. Sonoma Water seeks to use the minimum amount of herbicide necessary. Sonoma Water has identified "no synthetic spray" zones around its main campuses.

Sonoma Water has developed an Integrated Pest Management Plan. The goals of Sonoma Water's Plan are to:

- Create and maintain:
 - Suitable visibility of and access to structures and property to allow for inspection, maintenance, and use
 - Adequate flood control
 - Desirable aesthetics

- Public access and enjoyment
- Habitat
- Reduce fuel to prevent fire
- Prevent unacceptable risks to employee and public health and safety
- Comply with regulatory requirements
- Reduce herbicide use where feasible

Sonoma Water is committed to reducing herbicide use to the extent feasible. Over-reliance on or misuse of herbicides may result in increased risk of adverse impacts to workers, the public, and the environment. In some cases, it can also lead to the development of herbicide resistance and exacerbate existing vegetation problems. In an effort to reduce herbicide use, Sonoma Water engages in the following practices:

- Properly identify and monitor target vegetation,
- Utilize multiple control and prevention methods to manage nuisance vegetation,
- Identify sites where herbicide use is necessary or can be reduced or eliminated,
- Consider the use of herbicides categorized as alternative or organic, and
- Animal grazing.

Following summarizes, for each facility type, the amount of herbicide used (concentrate volumes are in parenthesis), for fiscal year 2020/2021.

4.5.1. Landscaped Facilities

Total herbicide at landscaped facilities was 15 gallons mixed (approximately 0.51 gallons concentrate). Sonoma Water primarily use herbicide for landscape maintenance surrounding Sonoma Water's facilities.

4.5.2. Wastewater Facilities

Herbicide use for wastewater facilities includes application at access road, grounds, reservoirs, and adjacent to appurtenant facilities such as lift stations and solar panels. Many of the reclamation storage reservoirs are inspected by the Department of Water Resources, Division of Safety of Dams, which requires control of brush and weeds on dam reservoirs. Usage by sanitation region is listed below.

- Airport/Larkfield/Wikiup Sanitation Zone: 45 gallons mixed (Approximately 3 gallons of concentrate)
- Geyserville Sanitation Zone: 20 gallons mixed (Approximately 1 gallons of concentrate)
- Russian River County Sanitation District: 10 gallons mixed (Approximately .1 gallons of concentrate)
- Occidental County Sanitation District: 5 gallons mixed spray (Approximately 0.05 gallons of concentrate).
- Sonoma Valley County Sanitation District: 500 gallons (Approximately 11 gallons of concentrate)

4.5.3. Water Supply Facilities

Only when necessary, herbicide use for water supply facilities includes application at the access roads, grounds, and appurtenant structures associated with booster stations, storage tanks, and pump stations. Total herbicide use at water supply facilities is 1050 gallons (approximately 12 gallons of concentrate)

4.5.4. Flood Control

Sonoma Water's stream management program includes multiple objectives such as resource protection and environmental sustainability in addition to flood management. Sonoma Water is working to help managed creeks evolve into waterways that not only provide good flood protection, but also provide good riparian habitat and water quality. This vision includes mature riparian canopy, with alders and other trees that grow tall and stretch their branches over the creek, cooling the water and shading out bushes, brush and less desirable species of trees that reduce the water-carrying capacity of the creek.

Routine maintenance is required by Sonoma Water's permits and other regulatory requirements. Maintenance activities include sediment management, bank stabilization, and vegetation management. Vegetation management activities include: willow pruning and removal; blackberry removal; cattail removal; ludwigia removal; tree pruning and exotics removal; mowing; and nursery stock tree planting. Vegetation management activities are overseen by a biologist, certified arborist, or other qualified personnel.

Sonoma Water's use of herbicides at flood control facilities is limited to three primary uses :

- Gravel access road spraying: 1000 gallons mixed (approximately 16 gallons of concentrate);
- Cut Stump Treatment (Approx. 4 gallons of concentrate): Application of concentrate directly to the cut stumps of non-native species.

4.5.5. Budget / Labor

Currently, Sonoma Water is able to balance the flood control vegetative needs (flood protection, grounds and facilities, dam safety, dry creek restoration, public requests, sediment removal, fire fuel reduction, etc) with available staffing and the limited use of herbicide. Herbicide application provides more longevity and efficiency to the absolute removal of the undesirable plant growth rather than mechanical practices that can only provide short term suppression and require more frequent maintenance attention. Mowing and pruning approaches cause vegetation to respond by rapidly replace lost growth quickly. Herbicide treatment will remain effective longer than mechanical treatments because of how plants respond to herbicide compared to mechanical treatment.

4.5.6. Safety

Public safety on shared creeks- Herbicide currently allows maintenance staff to maintain areas to provide a safe level of visibility- trail traffic, predators, flooding issues, gravel road preservation, etc. This could not be achieved annually through mechanical methods due to the many miles of creek corridors.

4.5.7. Restoration/Habitat

One of the main goals set out by Sonoma Water is to protect significant natural resources still present in watersheds. When necessary and no other feasible option exists, herbicide application is used to prevent new infestations of invasive species and work towards achieving sustained control over

existing populations. Creeks that were once thick with heavy invasive vegetation are now open and support a more diverse native habitat.

4.6. Transportation and Public Works

In fiscal year 2020/2021, the Department of Transportation and Public Works used 87 gallons and 1.5 dry ounces of product totaling 57 gallons and 1.5 dry ounces of concentrate herbicide and 30 gallons of concentrate adjuvant.

Although applicators do not spray into water, Transportation and Public Works used glyphosate and triclopyr registered for aquatic and terrestrial use this past year.

4.6.1. 2020/2021 TPW Herbicide Summary

4.6.1.1. Airport

Vegetation management activities at the Airport are completed to ensure the safe navigation of airplanes landing in and departing from the Airport. Specifically, Airport staff manage vegetation to maintain site sign, taxiway, lighting, and runway visibility and minimize obstruction and debris that could interfere with aircraft operations. These management goals are consistent with FAA regulations. Preservation of asphalt integrity in and around hangars is also a management goal. In the year 2020/2021, approximately 50 gallons of concentrate herbicide, 0 pounds of dry concentrate herbicide, and approximately 29 gallons of concentrate adjuvant were used.

4.6.1.2. Refuse

Vegetation management at refuse sites is conducted primarily for the purpose of preventing infrastructure damage and inaccessibility to operating equipment and maintaining regulatory compliance. Specifically, this includes objective such as maintaining the integrity of landfill cover systems and access to groundwater sampling locations, gas and leachate wells, and associated appurtenances. Employee safety and fire prevention are also emphasized by managing vegetation occurring in and along access roads. Approximately 0.06 gallons of concentrate herbicide, approximately 1.5 dry ounces of concentrate herbicide, and approximately .01 gallons of concentrate adjuvant were used in the 2020/2021 FY.

4.6.1.3. Right of Way

The right of way including roadsides and road yards. The overarching goal of vegetation management along County roads is to maintain roadway and traveler safety, and to address fire risks. To accomplish this goal, several objectives have been established for road maintenance activities. These objectives include maintaining: guardrail safety and visibility, road and sidewalk integrity, sign and signal light visibility, signal box accessibility, clear sightlines, and roadside drainage. In the year 2020/2021, approximately 7 gallons of concentrate herbicide, 0 pounds of dry concentrate herbicide, and approximately 1 gallon of concentrate adjuvant were used.

4.6.2. Training

TPW staff completed approved DPR continuing education hours including the California Association of Pest Control Advisers online conference.

5. Outreach and Education

Education and knowledge sharing strengthen the IPM programs.

5.1. Zero Waste Sonoma

Sonoma County is committed to keeping pesticides and other household toxic substances out of our environment. Proper disposal of pesticides is just as important as proper use. As part of the County's recycling program Zero Waste Sonoma, toxic substances can be dropped off at Sonoma County's main landfill at 500 Mecham Rd. In the fiscal year 2018-19, Zero Waste collected 167,225 pounds of household hazardous materials for proper disposal.



Figure 7 - Household Toxic Facility Collection Center

5.2. Our Water Our World

The Our Water Our World (OWOW) program raises awareness of the connection between pesticide use and water quality and provides information to consumers at the point-of-purchase about IPM and less toxic alternatives to control pests. Sonoma County and Sonoma Water support the OWOW program in the Russian River watershed, Sonoma Creek watershed, and the Petaluma River watershed as part of a regional effort.

A consultant was retained to bring pesticide-related education and outreach to 16 nurseries and hardware stores throughout the watershed. Outreach included print materials, special events, store employee training, and promotional labeling of environmentally friendly products.

The OWOW program includes:

- Twenty-two factsheets (including four in Spanish) are available to assist residents with finding non-toxic and less-toxic solutions for managing pests in and around the home. The factsheets are provided for specific pests and general pest control information.

- Stores are supplied with factsheets, shelf tags, literature rack display signage, “10 Most Wanted” brochures, “Pest or Pak Activity Guide for Kids,” custom-designed product guide dispensers, and two versions of product guides.
- Employee training and tabling events at participating stores. Training topics include pesticides impact to water quality, OWOW program overview, pesticide disposal, IPM techniques, beneficial insect identification, water conservation, benefits of mulch, water-wise plans pest highlights, invasive pest awareness, and the “Ask-the-Expert” website resource.
- Outreach and tabling events by OWOW to connect with store customers. Outreach includes assisting customers with less-toxic pest control options. OWOW services include mentoring and maintaining store materials.

5.3.Baywise.org

As a member of BASMAA, Sonoma Water supports the BayWise.org website. The website is designed to educate Bay Area residents and businesses about simple, cost-effective ways to protect San Francisco Bay by preventing pollution at the source. The website also provides resources on how to find a local less-toxic certified pest control professional with links to EcoWise, GreenPro, and Green Shield.



Figure 8 -Outreach Funded through Sonoma County Stormwater Program.

These trainings are being reimagined due to the 2020 pandemic and have started to hold virtually as we move into the 2020/21 fiscal year.

The County has traditionally maintained the brochure stand with 21 different brochures on topics including less toxic pest control methods for a variety of common local pests. Historically, the pattern is that brochure consumption increases during the spring and summer season and decreases during the colder fall and winter season.

5.4.Street to Creeks

Streets to Creeks is a regional outreach campaign consisting of targeted storm water messaging to promote education that storm water drains to the Russian River with no treatment. The program includes targeting residents for proper practices related to pollution prevention including car washing, carpet cleaning, home improvement, leaves, painting, pet waste, power washing, erosion control, vehicle maintenance, yard care, ash cleanup, trash and general rain ready practices. The campaign includes PSAs in ads before movies in local movie theaters, radio ads, ads on Pandora, and

on local billboards and includes a social media campaign. The Street to Creeks material is also available in Spanish.

5.5. Municipal Stormwater Program

As part of the MS4 Permit obtained through the Regional Water Quality Board, Sonoma County and Sonoma Water are part of ongoing pesticide research and advocacy to improve water quality. The Phase II and Phase I Permittees made contributions to CASQA through BASMAA. CASQA conducted its activities on behalf of its contributors and its members and coordinated funding contributions and activities through its Pesticides Subcommittee, a group of stormwater quality agencies affected by pesticides or pesticides-related toxicity listings, TMDLs, or permit requirements, as well as others knowledgeable about pesticide-related stormwater issues. FY 2020-21 was another productive year for the Subcommittee. The CASQA Pesticides Subcommittee's annual report for FY 2020-21 provides a comprehensive and detailed accounting of efforts to track and participate in relevant regulatory processes as well as accomplishments related to pesticides and stormwater quality and can be found on the BASMAA website.

6. 2020/2021 Pesticide Annual Reporting Improvements

The goal of Sonoma County, Sonoma Water, Ag + Open Space, and the Community Development Commission is to remove unwanted vegetation by hand and with equipment, but may also employ selective herbicidal application. The agencies use herbicide to control invasive plant species that are problematic for their facilities. All agencies seek to use the minimum amount of herbicide necessary. Our goal moving forward is to be transparent on the use of herbicide. Our overarching goal is to reduce the use of herbicide, if feasible. Many factors will be used to make such a determination. In addition, further process improvement into 2021 to include tracking labor and equipment hours associated with mechanical removal. This data will continue to inform vegetation management decisions.