



# Vegetation Management Annual Report

Sonoma County

Fiscal Year 2018/2019

March 2020

2550 Ventura Ave  
Santa Rosa, CA 95403

*Cover photo: Manual removal of invasive water fern (azolla sp.) by Regional Parks staff*

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## 1. Introduction

On June 4, 2019, the Board of Supervisors of the County of Sonoma passed a Board Resolution 19-0246 prohibiting the use of synthetic pesticides in sensitive areas and launching a more transparent reporting of pesticide use on County owned land. This included a mandate to revise current IPM policies through County Departments 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. All synthetic pesticides used by Sonoma County are registered with the U.S. EPA and reported to the California Department of Pesticide Regulation.

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 California Department of Pesticide Regulation 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 County IPM program provides outreach to the public through volunteer opportunities and education. These pieces are largely held by Regional Parks.

Consistent with the Resolution, the County of Sonoma will submit an annual report of pesticide use by County departments throughout the County. This document is the initial report combining the work of six different departments and special districts with landscaping authority in the County. The focus of each department is observably different and this report reflects the fiscal year 2018/19 which is mostly prior to the Board Resolution and the approval of the departments’ new IPM policies.

As such, this report serves as a starting point from which to better capture and be transparent with the use of synthetic pesticides by the County of Sonoma around sensitive areas as well as the efforts to use alternative control methods for vegetation management.

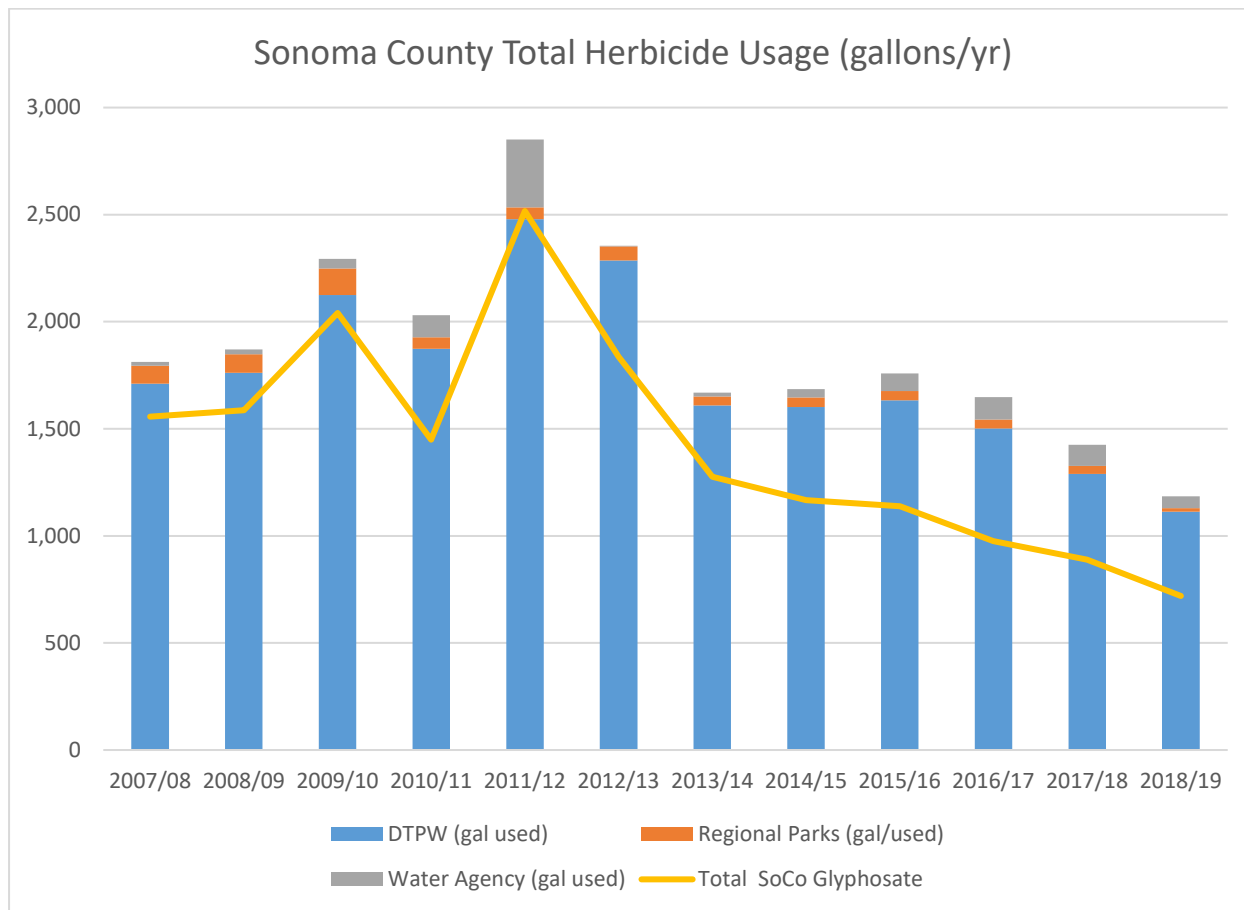
## 2. State Department of Pesticide Regulation Pesticide Reporting Requirements

The California Department of Pesticide Regulation (DPR) requires reporting of pesticide use in California for qualifying situations. As related to use by the County of Sonoma 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 applications to roadsides are all considered agricultural uses. For these applications, the departments submit records to the Sonoma County Department of Agriculture/Weights & Measures (AWM) who then forwards the data to DPR. Additionally, any application of pesticides by a pest control business (either on agricultural land or for structural use) is submitted to AWM who forwards them to DPR. The use is all reported on a monthly basis. Some uses are not reportable to DPR. For the County of Sonoma 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.

## 3. Synthetic Pesticides Use

### 3.1. DPR Reported Usage

The County of Sonoma adopted an IPM Policy in 2001 and amended the policy in 2014. The County has tracked its use of pesticide use since 2007. Much of the initial reporting has been around glyphosate as this is of particular concern to the public. Glyphosate is a broad-spectrum systemic herbicide and crop desiccant. It is an organophosphorus 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 County pesticide use are shown in the following graph with similar tracking of glyphosate mirroring the trend of overall pesticide usage.



**Figure 1 - Trend of Total Herbicide Use**

Herbicide use varies from year to year depending on weather, time, targeted weeds, new invaders, and new managed lands. In 2019, County departments reviewed and updated IPM policies to reflect increased concern regarding the use of the herbicide Glyphosate. In general, the use of herbicide including Glyphosate is decreasing across all County-managed lands. In future years, newly adopted IPM policies, implementation of no-synthetic spray zones, use of non-synthetic chemicals, and ongoing manual or mechanical weed treatments will impact the use of herbicide by the County over time.

Further process improvement will continue into 2020 and include tracking labor and equipment hours across all departments associated with mechanical removal. This data will continue to inform vegetation management decisions.



## 4. 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.

## **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.

## **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; or 2) the environmental benefit is clear and outweighs the negative impacts of continued weed infestation; and 1) only licensed professionals are involved in the application; and 2) there is minimal risk of harmful exposure to humans or to sensitive resources; and 3) 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 2019, 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 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. Staff is also working with Cal Fire to introduce prescribed burning as an additional, non-chemical method of control. At Saddle Mountain, yellow star thistle threatens the integrity of otherwise healthy native perennial grasslands, and staff has conducted 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.

### **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 2019, spot treatment was applied with broadleaf-specific herbicide to check its spread. Ultimately, it is expected 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. 2019 was the sixth 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. It is anticipated that one more widespread application is needed in 2020, 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.

### **Capeweed**

This invasive aster species forms dense mats that prevent other vegetation from growing in infested areas. It has been used as a groundcover in residential and commercial landscaping and sometimes escapes cultivation and becomes established in grasslands and rangelands, as it has done to a limited extent at our Carrington Coast Ranch. Ag + Open Space used an herbicide application in 2019 to manage the known single population of this species on the property, which was very effective in almost completely eliminating the population. Monitoring will continue prior to the upcoming ownership transfer to Regional Parks.



**Cape ivy**

This vine is an aggressive invasive that is widespread along the California coast. It can form dense mats that smother other vegetation. If pulled, cape ivy can resprout from small stem fragments left behind. A small population exists on Carrington Coast Ranch, growing on an around the sheep shed and in the nearby Monterey cypress. Ag + Open Space used an herbicide application in 2019 to manage this known population of this species on the property, which was quite effective in reducing the population. Monitoring will continue prior to the upcoming ownership transfer to Regional Parks.

**Pampas grass**

This species is a large ornamental grass that grows in clumps with sharp leaves and tall, plume-like flowering heads. Pampas grass grows particularly well in disturbed soil, can displace native plants, and has become densely established along portions of the Sonoma Coast. Pampas grass grows in several areas on Carrington Coast Ranch, including the sites of previous landslides and along stream banks. Treatment in 2019 involved cutting and removing the flowering heads to prevent the spread of seeds, followed by herbicide application. This treatment was quite effective, though new growth was observed. Ag + Open Space will continue to monitor prior to the upcoming ownership transfer to Regional Parks.

**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 our 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.

**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, which we will begin removing in 2020.

Total synthetic herbicide use on Ag + Open Space-owned properties from July 1, 2018 to June 30, 2019 was 3.3 gallons, on 78.8 acres. This included 1.5 gallons of glyphosate-based product. Note that these numbers describe the total volume of product used, and represent 1.3 gallons and 0.6 gallons of active chemical, respectively.



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*

## 5. Community Development Commission

### 5.1. Use of Insecticides

In response to tenant complaints related to insect presence at the Russell Avenue Homeless Veterans project, Village Green II, and Roseland Village, 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 the use of:

- Optimate CS (gamma-cyhalothrin) used to control ants, mosquitoes, etc.
- Termidor SC (Fipronil) used to control termites
- Premise 2 (Imidacloprid) used to control termites
- Suspend Polyzone-LV (Deltamethrin) used to control ants and roaches
- Essentria IC3 (Fifra 25/Rosemary Oil/NOP) used to control flying and crawling insects at Roseland Village

### 5.2. 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, Roseland Village, Village Green II, W. College, and Broadway Avenue.

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 to transition to the most suitable organic alternatives available and to further work on prevention measures to avoid issues from arising.

## 6. 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 the County's assets and assists front line Departments in contracting for goods and services essential to fulfilling their respective missions. While GSD does not directly perform grounds maintenance work, specifications and performance criteria involving herbicide or pesticide use have been revised to reflect the Boards Resolution, and are strictly enforced through management and oversight of contracts. GSD will continue to ensure that the County's "No Synthetic Spray" zone policies are reflected and adhered to in its various contracting programs, such as job order contracting (JOC), competitive bidding, and requests for proposals (RFP).

## 7. Regional Parks

The Sonoma County Regional Parks Department (Regional Parks) owns and/or manages over 12,000 acres across 58 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.

The purpose of this document Vegetation Management Annual Report is to showcase 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

### 7.1. 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 experienced a huge increase in the growth of invasive species after the 2017 Tubbs and Nuns fires. Broom species, for example, rapidly colonized after wildfires. A result of fire, 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 and 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 12,000 acres and 58 parks, trails, and marinas.

2018/19 actions:

# acres mowed: Over 400 annually

Future actions: In partnership with other agencies and non-profits, Regional Parks was awarded a grant from Calfire to expand the use of shaded fuel breaks in the Sonoma Valley Area to increase community protection and reduce wildfire risk.

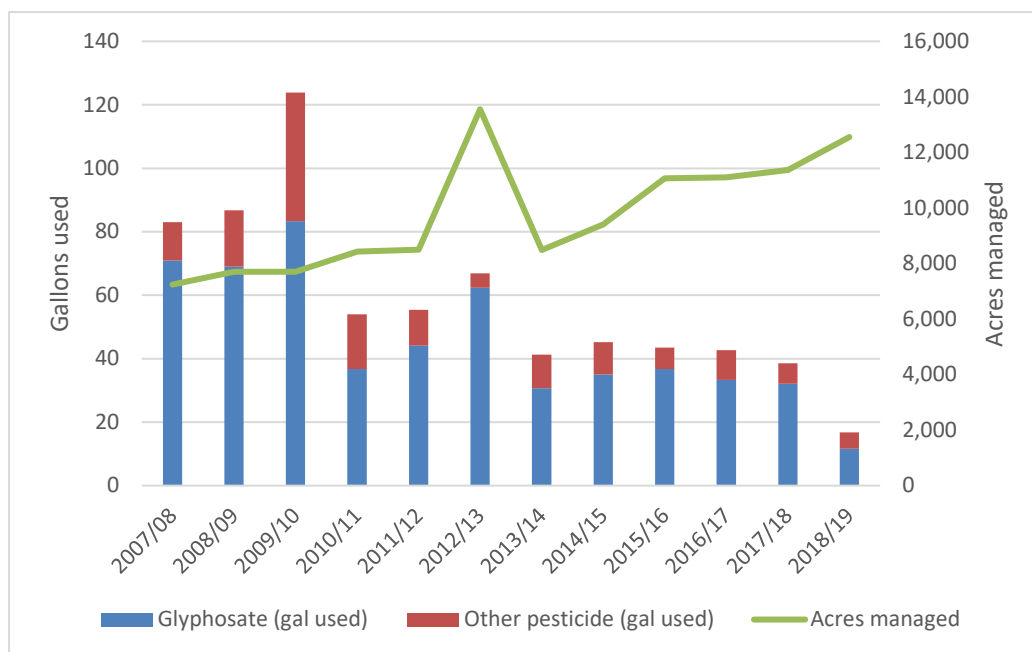
## 7.2. Pesticide Use

Regional Parks is committed to reduce the risk of exposure to toxins for both people and pets that use the parks. Regional Parks is committed to eliminate the use of synthetic pesticides (of which herbicides are a subset) for routine, ongoing maintenance to control invasive weeds. Regional Parks maintains the use of synthetic pesticides to treat and control specific, targeted pest invasions when other means of control are inadequate. All pesticide use is reported to the Sonoma County Agricultural Commissioner. This commitment, affirmed in the June 6, 2019 Resolution of the Sonoma County Board of Supervisors, marks a transition away from less discriminating use of pesticides shown in our decreased use of chemical treatment over time.

Historically, glyphosate makes up the majority of synthetic pesticides used by Regional Parks or around 78% since fiscal year 2007/2018. Use of all pesticides including glyphosate are at an all-time low.

While the total acres managed by Regional Parks continues to grow over time, overall use of pesticides continues to decline. Since fiscal year 2013/2014, Regional Parks has used approximately 40 gallons of pesticide per year. With the relabeling of glyphosate and resulting discussions throughout the County, Regional Parks temporarily halted all use of synthetic pesticide use while the June 6 resolution was developed. As a result of the June 6, resolution and Regional Parks updated an Integrated Pest Management Plan (IPM Plan) and committed to eliminating the use of pesticides in playgrounds, parking lots, plazas, campgrounds, and other places where people and pets gather.

## Pesticide Use in Sonoma County Regional Parks is at a Record Low



*Figure 3 - Total use of pesticides over time including glyphosate (blue bar) and all other pesticides (maroon bar) by Regional Parks relative to acres managed (green line). Pesticide use declines despite overall trend of increased acreage. Of note: Regional Parks temporarily took over management of Annadel State Park in fiscal year 2012/2013 causing the temporary increase and decrease in acreage.*

### 2018/19 actions:

# Gallons synthetic pesticide used: 17

# Acres managed: 12,556

### Future actions:

As Regional Parks maps and treats new weed invasions, acquires new lands, and invests in natural resource management, we anticipate the increase all strategies of IPM control: biological, cultural, mechanical, physical, and chemical control. We 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.

Historically, use of organic chemical weed treatments has not been recorded, as reporting of their use is not required by the State of California. Use of organic treatments will be tracked in the future.

## 7.3. 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, our 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 primarily not 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 adopted a tool 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, Midpeninsula Regional Open Space, and One Tam among others.

In the last months of the fiscal year, a team of 4 crew members surveyed 7 parks mapping and treating both emergent invasives and emergent populations of established invasives. By the end of the field season, crew members surveyed nearly all 58 Regional Parks and trails for watch list weeds.

2018/19 actions:

# staff trained in Weed Manager phone mapping app: 5

# parks surveyed: 7

# observations: 324

Future actions:

Due the process of EDRR requiring both surveys for presence of target weeds prior to treatment, we anticipate a loping cycle of one year weighed toward detection and the subsequent year weighted toward control.

In the next fiscal year, we will expand mapping throughout the Regional Park system. In coming years, we will expand training to include additional staff and volunteers, hire permanent staff to oversee the program, and expand implementation of control.

## 7.4. 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; 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.

2018/19 actions:

# of parks grazed: 7

# acres grazed: 4446

Future actions:

Expand grazing to additional parks likely to include: Mark West, Cloverdale, Foothill, and Gualala



*Figure 4 - Sheep graze fuel breaks at Helen Putnam Regional Park near Petaluma.*

## 7.5. Collaboration

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. 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, Fetters 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.

2018/19 actions:

# of new partnerships: 1 (Sonoma Valley Collaborative)

# of existing partnerships: 1 (Laguna Foundation)

Future actions: Over the next three years, these fuel reduction projects will be implemented in Sonoma Valley Regional Park, North Sonoma Mountain Regional Park, and Hood Mountain Regional Park in addition to Collaborative partner lands.

## 7.6. Prescribed Fire

In partnership with CALFIRE and the Sonoma Valley Wildlands Collaborative, Regional Parks successfully implemented an organizational first – a prescribed fire at Sonoma Valley Regional Park. The prescribed fire, on just over 18 acres, reduced the risk of wildfire ignition along Highway 12 in the Sonoma Valley, control invasive grass medusa head, and invested in a partnership model with CALFIRE and develop comfort with the use of fire as a tool.

2018/19 actions:

# staff trained in basic fire firefighting: 3

# acres burned: 18.1

# pile burn days: 1 (Coastal Prairie Trail)

Future actions: We will work with Calfire and others to expand use of fire into new parks such as Gualala Point Regional Park, Tolay Lake Regional Park, Taylor Mountain Regional Park, Shiloh Ranch Regional Park, and others. Regional Park is also making a significant investment in training numerous staff in basic wildland fire fighting. Even with additional resources, interest, and investment, prescribed fire will always be subject to significant planning, permitting, site preparation, availability of resources and favorable weather conditions.



*Figure 5 - Calfire and Regional Parks staff ignite and monitor a prescribed burn at Sonoma Valley Regional Park on June 17, 2019.*

## 7.7. Saving Sebastopol meadowfoam: a case-study in vegetation management



Figure 6 - Critically endangered Sebastopol meadowfoam (*Limnanthes vinculans*).

Years of monitoring by Regional Parks and non-profit partner the Laguna de Santa Rosa Foundation (Laguna Foundation) documented the precipitous decline of endangered species Sebastopol meadowfoam, an annual wetland plant only known to grow naturally in a few places in and around Sebastopol including on Regional Parks' Laguna Trail property. To preserve the species and prevent local extirpation, Regional Parks worked with the Laguna Foundation to collect seed from the few remaining individual plants and propagate them offsite. Through a combination of mowing, weed whacking, grazing, and targeted herbicide application, Regional Parks staff and partners will continue to control invasive Perennial pepperweed and Reed Canary grass that had invaded the site. The site was re-seeded with Sebastopol meadowfoam seed in 2019 and is now actively recovering.



## 8. Sonoma Water

Since the initial flood management programs of the 1950s, routine maintenance needs have continued to be assessed and prioritized through seasonal and annual inspections with various sediment removal, bank stabilization, and vegetation management activities prioritized as necessary following inspections. The mandate and requirement for routine annual maintenance to provide adequate flood protection has not wavered since the construction of the stream and channel facilities. However, Sonoma Water's perspective towards stream management has evolved and now includes multiple objectives such as resource protection and environmental sustainability in addition to flood management. 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. Following summarizes, for each facility type, the amount of herbicide used (concentrate volumes are in parenthesis), for 2018/19.

**8.1. Landscaped Facilities:** 55 gallons mixed (approximately 0.5 gallons concentrate). Sonoma Water primarily use herbicide for landscape maintenance surrounding Sonoma Water office complexes (404 Aviation Blvd; 204 Concourse Blvd; and Water Education Center). These area has subsequently been deemed a no-herbicide spray zone in compliance with the 2019 Sonoma Water's Board of Directors resolution.

**8.2. Wastewater Facilities:** Herbicide use for wastewater facilities include 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: 512 gallons mixed (approximately 6.0 gallons of concentrate).
- Geyserville Sanitation Zone: 120 gallons mixed (approximately 1.4 gallon of concentrate).
- Russian River County Sanitation District: 40 gallons mixed (approximately 0.5 gallons of concentrate).
- Sonoma Valley County Sanitation District: 1,615 gallons (approximately 15.4 gallons of concentrate).

**8.3. Water Supply Facilities:** 888 gallons (approximately 10.5 gallons of concentrate) Herbicide use for water supply facilities include the access roads, grounds, and appurtenant structures associated with booster stations, storage tanks, and pump stations.

**8.4. Flood Control:** There are three primary uses of herbicide for Sonoma Water's flood control facilities.

- Gravel access road spraying: 655 gallons mixed (approximately 5.0 gallons of concentrate);
- Gravel access roads are sprayed on Water Agency properties to maintain access road integrity. - Invasive Species Control: 1,095 gallons mixed (approximately 15.0 gallons of concentrate)
- Cut Stump Treatment (Approx. 1.5 gallons of concentrate): Application of concentrate directly to the cut stumps of non-native species.

**8.5. Budget / Labor:** Flood Control's annual budget would not be able to support the additional labor costs needed to annually remove undesirable vegetation from Sonoma Water's property to a level that is safe and effective. The availability of annual field staff is not sufficient to support the level of effort needed to mechanically manage the annual growth of seasonal weeds and invasive plant material, i.e. the time needed to replace what is currently accomplished through herbicide application with staff 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 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.

**8.6. Safety:** Vegetation growth commonly occurs in unsafe growing environments and serves as a safety threat to those performing the maintenance – loose rock and non-stable surfaces, tight access, traffic, non-permeable surfaces. These areas are safer to manage with the aid of herbicide and the proper application method in order to permanently remove the plant type and eliminate the need to re-visit.

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.

**8.7. Fire Hazard:** With limited seasonal staff population each year and a limited window of permitted time allowed in the creeks, Sonoma Water is able to dedicate time to perform 'fire fuel reduction' practices. This time may become jeopardized if staff are needed to perform the work that herbicide application once achieved.

**8.8. Restoration/habitat:** One of the main goals set out by Sonoma Water is to protect significant natural resources still present in watersheds. Herbicide application is used to work towards preventing new infestations of invasive species and work towards achieving a sustained control over existing populations. Creeks that were once thick with heavy invasive vegetation are now open and supporting a more diverse native habitat.

**8.9. State Regulations:** Sonoma Water is regulated by the California Department of Water Resources, Division of Safety of Dams (DSOD). DSOD regulates dams to prevent failure, safeguard life, and protect property. DSOD annually reviews our flood control and reclamation reservoirs and infrastructure to ensure compliance. Without the use of herbicide, proper maintenance to these areas would be extremely costly with additional labor needs.

**8.10. Utility Roads/ Public Access:** The gravel roads along flood control channels would rapidly deteriorate due to accumulation of weeds and biomass. The roads would require frequent regrading and re-rocking to maintain. Sonoma Water would not be able to accommodate this volume of work, therefore,



the roads would deteriorate to a condition that they would not be accessible for maintenance staff in the winter, limiting, Sonoma Water's ability to maintain the channels in the winter.

Goals of Sonoma Water Stream Maintenance Program's is the development of a shaded canopy over the flood control channels is 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

## 9. Transportation and Public Works

In fiscal year 2018/2019, The Department of Transportation and Public Works used 1,434 gallons and 354 pounds of product totaling 1,068 gallons and 354 pounds of concentrate herbicide and 366 gallons of concentrate adjuvant.

Transportation and Public Works used only glyphosate registered for aquatic and terrestrial use this past year as this is the direction our Department is heading with all of our post-emergent spraying even though applicators do not spray into water. TPW also changed our post-emergent herbicide program by switching

to a newer formulation of a broadleaf weed and woody plant herbicide. The newer product has a warning label instead of a danger label increasing worker safety and like glyphosate this newer formulation of triclopyr may be applied to aquatic or non-aquatic sites. Additionally we worked on updating our IPM plan. The IPM plan, no synthetic spray zone maps, and the organic herbicide trial were completed at the beginning of the 2019/2020 fiscal year.

## 9.1. 2019 TPW Herbicide Summary

### 9.1.1. 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 regulation. Preservation of asphalt integrity in and around hanger is also a management goal. In the year 2018/19, approximately 57 gallons of concentrate herbicide, approximately 39 pounds of concentrate herbicide, and approximately 21 gallons of concentrate adjuvant were used.

### 9.1.2. 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 19 gallons of concentrate herbicide, approximately 1 pounds of concentrate herbicide, and approximately 8 gallons of concentrate adjuvant were used.

### 9.1.3. 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 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 2018/19, approximately 992 gallons of concentrate herbicide, approximately 314 pounds of concentrate herbicide, and approximately 337 gallons of concentrate adjuvant were used.

### 9.1.4. Training

TPW staff attended seminars approved by DPR for continuing education hours including the California Weed Science Society conference, and a seminar put on by the Pesticide Applicators Professional Association.

## 10. Outreach and Education

Education and knowledge sharing strengthen the County of Sonoma's IPM program.

### 10.1. 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 Meham Road. In the fiscal year 2018-19, Zero Waste collected 167,225 pounds of household hazardous materials and insured proper disposal.



Figure 7 - Household Toxic Facility Collection Center

## 10.2. Sonoma County Residential Outreach Efforts – OWOW

Retained the services of Our Water Our World consultant to bring pesticide-related education and outreach to 15 nurseries and hardware stores throughout the watershed. Outreach included print materials, special events, store employee training, and promotional labeling of environmentally friendly products. A total of 173 store visits were made throughout the region during the 2018/2019 reporting period



Figure 8 -Outreach Funded through Sonoma County Stormwater Program.

The County of Sonoma will continue to support deployment of Our Water, Our World outreach materials at pesticide retailers and at County permitting offices; conduct applicator trainings; and gather data on flyer attrition at the major pesticide retailer in Sonoma Valley and County permit offices to assess program effectiveness. Sonoma County Regional Parks and the City of Sonoma will host a total of 20 pesticide applicator workshops.

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.

### 10.3. Sonoma County Stormwater Program

As part of Sonoma County MS4 Permit obtained through the Regional Water Quality Board, Sonoma County is 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 2018-19 was another productive year for the Subcommittee. The CASQA Pesticides Subcommittee's annual report for FY 2018-19 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.

## 11.2019/2020 Pesticide Annual Reporting Improvements

The goal of the Department in this report is to remove unwanted vegetation by hand and with equipment, but may also employ selective herbicidal application. The Departments uses herbicide to control invasive plant species that are problematic for its facilities. All Departments 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 2020 to include tracking labor and equipment hours across all departments associated with mechanical removal. This data will continue to inform vegetation management decisions.