



Midpeninsula Regional
Open Space District

R-17-50
Meeting 17-10
April 26, 2017

AGENDA ITEM 5

AGENDA ITEM

Annual Integrated Pest Management Report, 2016

GENERAL MANAGER'S RECOMMENDATION

No Board action required.

SUMMARY

On December 10, 2014 (R-14-34), the Midpeninsula Regional Open Space District's (District) Board of Directors adopted the Final Environmental Impact Report for the Integrated Pest Management Program and approved the Integrated Pest Management Program (IPM) and Policy. The program requires an annual report of pest management activities that describes past pest control activities, both chemical and non-chemical, on District lands. This report presents the results of the second year of pest management activities prescribed under the District IPM Program. The District treated thirty-three species, including seventeen listed noxious weeds (plants that have been defined as a pest by state law or regulation) using a variety of treatment methods. Treatment methods that included the use of chemicals did so using only Board approved chemicals. Overall, the second year of implementing the IPM Program has resulted in an additional 7.4 acres of District land being treated. Eleven new projects were added to the existing 310 projects in progress.

DISCUSSION

Integrated Pest Management (IPM) is a long-term, science-based, decision-making system that uses a specific methodology to manage damage from pests. The District defines pests in its Resource Management Policies as "animals or plants that proliferate beyond natural control and interfere with natural processes, which would otherwise occur on open space lands," and target pests as "plant or animal species that have a negative impact on other organisms or the surrounding environment and are targeted for treatment." IPM requires monitoring site conditions before, during, and after treatment to determine if objectives are being met and if methods need to be revised.

On December 10, 2014 (R-14-34), the District's Board of Directors adopted the Final Environmental Impact Report for the IPM Program and approved the IPM Program and Policy. As a component of the IPM Program, an Annual Report is required to be prepared describing the pest management activities undertaken and comparing past pest control activities, both chemical and non-chemical, on District lands. The IPM Program identified criteria for assessing the program

every year primarily regarding protection of human health in buildings, protection of natural resources in the preserves, training, and clear communication with the public.

The attached Annual Report (Attachment 1) is the second annual report prepared for the IPM Program and describes the IPM activities undertaken in 2016. Some of the highlights from the second year of the program, detailed in the annual report, are listed below:

Summary of Pest Problems

Thirty-three plant species found on District lands are treated on an on-going basis to control for asset based protection and long-term management. These species have the potential to invade natural areas and displace native species and reduce biodiversity. Of the listed species, seventeen are considered noxious weeds by the State of California. New potential pest control projects were submitted to the IPM Coordinator using the District's new Pest Control Project Form. Potential projects were evaluated using the Project Ranking System developed by the IPM Coordination Team during this year. Eleven new pest control projects were determined to have high priority for treatment on District lands.

Summary of District Pest Control Treatments

Table 1: Treatment hours by crew type, below, presents the number of hours during the 2016 calendar year expended by staff, contractors, and volunteers controlling pest species on District Natural Areas:

Table 1: Treatment hours by crew type

Treatment Method	Hours		
	Staff	Contractor	Volunteer
Brush Cut / Mow	Monitoring and data collection Protocols under development	365	0
Cut		54	316
Dig		299	415
Herbicide		598	0
Pull		343	2152
Total		1659	2883

Manual removal of weeds via pulling remains the most prevalent treatment method at 55% of all hours; herbicide accounts for 13% of all hours. As was the case with the prior year (2015), some monitoring protocols were still in development during the year, and changes to the data collection protocol resulted in data sets that did not permit analyses of some metrics, most significantly the calculation of staff time expended conducting specific treatment methods. Additionally, brushing/mowing of roads, trails, defensible space, or emergency landing zones is not presented because these activities do not change from year to year.

The District has partnered with CalFlora, a non-profit organization, in which treatment data is collected and stored in a cloud based database. During 2016, incomplete legacy data was transferred to CalFlora due to incompatible data sets resulting in unknown staff hours. As data is made available with the use of the CalFlora Database, additional analysis will occur in future years.

Figure 1 below presents an analysis of treatment costs per infested acre, derived from contractor pest treatments data. Although cutting is the most cost effective treatment option, it is limited to a very few plant species (e.g. teasel). Hand pulling target species is the most expensive option, but is also considered the most precise and in most cases the most ecologically sensitive. Future reports will present total summaries of treatment cost per acre; however, because staff time was not tracked per individual treatment method, analysis of cost per acre by District staff cannot be calculated this year.

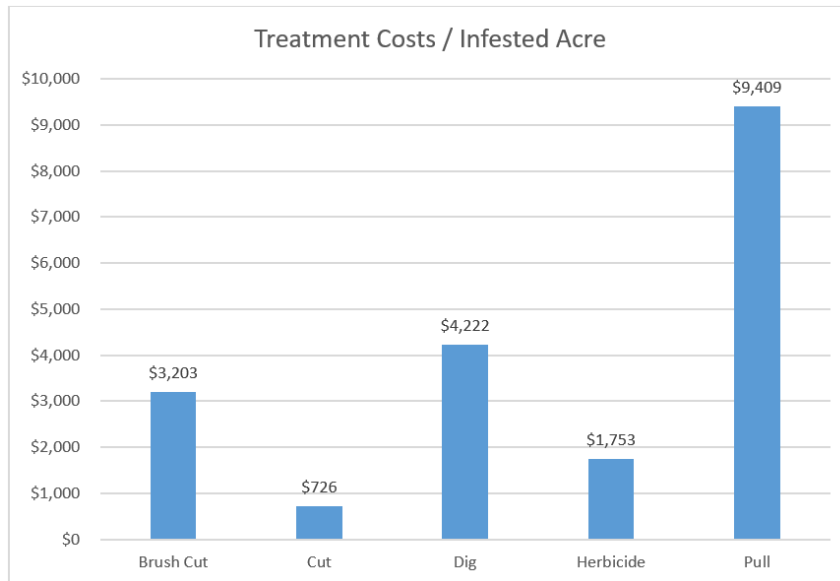


Figure 1: Treatment costs per infested acre

Effectiveness of District's Pest Control Program

When chemical pesticides are used on District lands, the District is committed to the use of lower pesticide exposure classification products in buildings and recreational structures for worker and visitor health and safety. Pesticides used in buildings and at recreational structures in 2016 were consistent with the 6 approved structural pesticides, all of which are "Caution" label (as opposed to "Warning" or "Danger" labels) and therefore pose a reduced risk to workers or occupants of treated buildings.

In natural areas, herbicide and non-herbicide methods were used to control high priority invasive plants to protect and restore native vegetation at preserves. The District seeks a reduction in per-acre usage of herbicides over time at individual sites, but acknowledges that in some instances use will initially increase, followed by a reduction in herbicide use when the pest is eliminated or reduced to a level that can be effectively managed with non-herbicidal methods.

Methods used on District lands to reduce pesticide usage include the techniques of mow/spray/mow and timed mowing. To reduce herbicide use, workers will first mow larger vegetation and once the vegetation has re-sprouted to a vulnerable stage, workers apply an herbicide treatment and then re-mow once dead. Staff performed this technique on stinkwort with great success at the Hicks Creek Ranch parking area (Sierra Azul OSP). An additional method employed is timed mowing, for example of yellow star thistle at the Mindego Gateway area of Russian Ridge Open Space Preserve, where the plant is mowed at the specific point in time in its growth cycle when it is most susceptible to the mowing to reduce the density and seed dispersion.

Additionally, Midpen uses conservation grazing to manage fuel (flammable vegetation) for fire protection; enhance the diversity of native plants and animals; help sustain the local agricultural economy; and foster the region's rural heritage. Midpen uses conservation grazing on approximately 10,800 acres as a tool to manage grassland habitat on portions of 5 preserves. In the absence of natural disturbance (i.e. fire), the District periodically does brush removal on grasslands to slow the encroachment.

Pesticide Use

The reporting of pesticide use on District lands includes staff, contractors, and tenants. Table 2 below summarizes the known use of pesticides on District lands, excluding PG&E that is not covered under the District's Integrated Pest Management Program, but is still required to report pesticide use to each County Agricultural Department. All PG&E work is reviewed by District staff and the use of herbicide is limited to the approved pesticide list under the IPM program. The District's herbicide Best Management Practices and mitigation measures are adhered to by PG&E.

Table 2: Pesticide use by active ingredient

<i>Pesticide</i>	<i>Active Ingredient</i>	<i>Amount Used (oz)</i>	<i>Acres Treated</i>	<i>Oz/Acre</i>
Fungicide	Potassium salts of phosphorus acid	5011.2	22.6	256
Herbicide	Aminopyralid	9.07	26.44	0.34
	Clethodim	0.00	0.00	-
	Clopyralid	3.08	1.90	1.62
	Glyphosate	3677.1	Measurement Protocols Under Development	-
	Imazapyr	243.32	15.06	16.16
Insecticide	Pyrethrin	420	N/A	N/A
Rodenticide	Cholecalciferol	0	0	0

Recommended application rates, as specified on a product label, vary by Active Ingredient and formulation of any particular pesticide product. For example, the specified application rate for Roundup ProMax with glyphosate as the Active Ingredient ranges from 32 to 160 oz per acre, depending on the target plant species. The specified application rate for Milestone with Aminopyralid as the Active Ingredient ranges from 3 to 7 oz per acre, depending on the target plant species.

As monitoring and data collection protocols were under development for staff in 2016, acres treated for the use of glyphosate was not collected. Thus, ounces of product used per acre cannot be calculated.

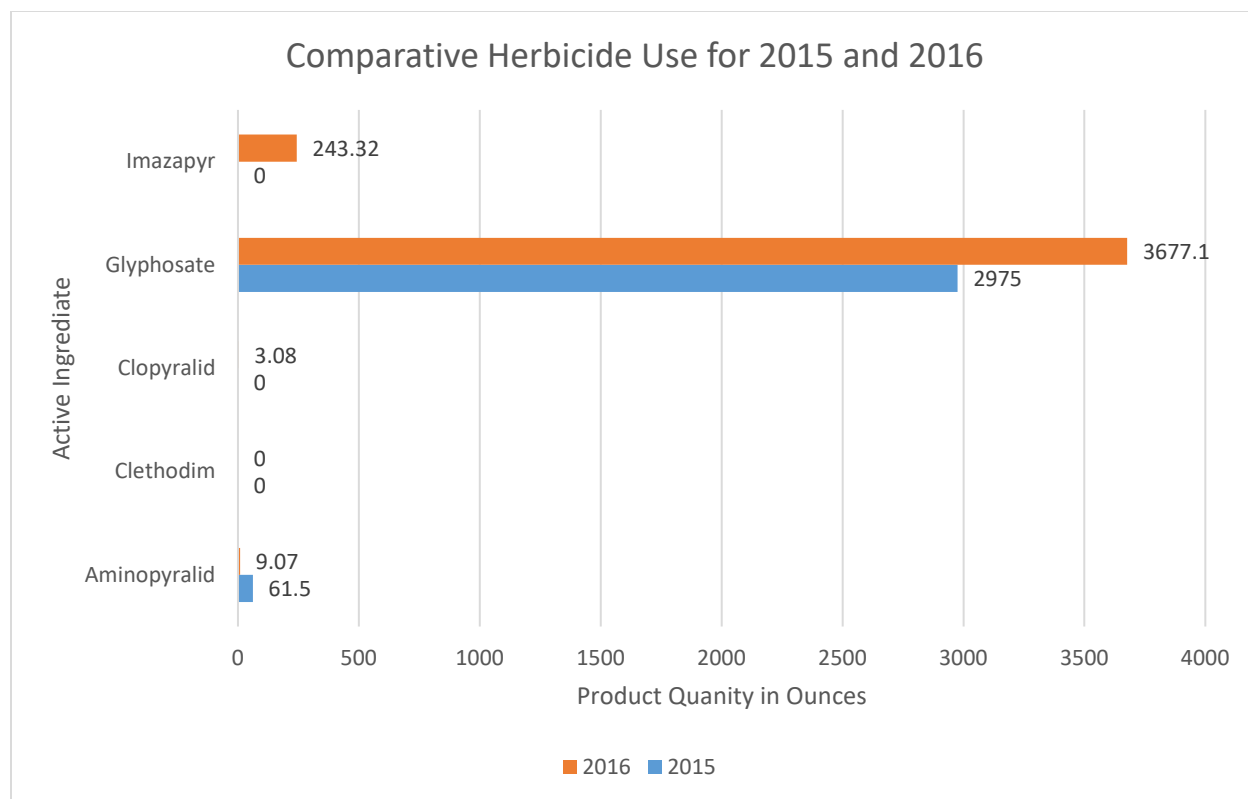


Figure 2: Comparative herbicide use for 2015 and 2016

Figure 2 above presents an analysis of the herbicides used by District staff and contractors to control pest plant species. The main active ingredient used is glyphosate, the active ingredient in Round-Up. Herbicide use has increased over the previous year. This increase is the direct result of intensive invasive species work at Bear Creek Redwoods. The initial knock down period is expected to last three year, after which an increase in both manual and mechanical treatment methods will partially replace the need for chemical applications.

Public Notification and Inquiries

Prior to, during, and after the application of a pesticide (including herbicides, insecticides, or other types of pesticides) on District preserves, employees and contractors post signs at the treatment area notifying the public, employees and contractors of the District's use of pesticide. All contractors notify the District before application on any property, and comply with requirements for notification and posting of signs.

There were no recorded public inquiries relating to the IPM Program.

Compliance with the Guidance Manual

The List of Approved Pesticides is intended to change over time as the science of pest control advances and more effective, safer, and less harmful pesticides are developed. As manufacturers update, discontinue, or substitute products and as the District's target pests change over time, recommended additions or deletions of approved products will be made by staff. The changes to the Approved Pesticides list in the IPM Program is summarized in the table below. Staff will return to the Board for approval of these changes upon completion of the toxicological analysis of new products. Recommended updates to the List of Approved Pesticides are as follows:

Table 3: Recommended updates to the List of Approved Pesticides

Action	Category	Product	Signal Word	Memo
Substitution	Fungicide	Agri-Fos	Caution	Agri-Fos and Reliant have the same active ingredient. Reliant can be purchased at a reduced price.
		Reliant	Caution	
Addition	Insecticide	Wasp Freeze II	Caution	Toxicological research is now being prepared.
	Insecticide	Python Dust Bag	Caution	Toxicological research is now being prepared.
	Herbicide	Garlon 4 Ultra	Caution	Toxicological research is now being prepared.
	Herbicide	Capstone	Caution	Toxicological research is now being prepared.

Pesticides that have been identified as possible additions to the approved pesticide list under the IPM program are undergoing toxicological review by Blankinship and Associates of Davis, CA. This review is scheduled to be completed by the end of the fiscal year.

FISCAL IMPACT

Receipt of the 2016 Annual IPM Report will not result in a fiscal impact. Implementation of the IPM Program occurs across several different Departments, including Land and Facilities, Visitor Services, and Natural Resources. Each Department separately budgets for pest management activities within the Department operating budget. Future annual reports will include analyses of the budgetary impacts of pest management activities as more data become available.

BOARD COMMITTEE REVIEW

The IPM Policy established direction that an annual review of the IPM Program be completed by the full Board of Directors.

PUBLIC NOTICE

Public notice was provided as required by the Brown Act. Public notice was sent to 168 interested parties and tenants by postal or electronic mail.

CEQA COMPLIANCE

All of the activities undertaken in 2016 to manage pests on District lands, and summarized in this report, were conducted in compliance with the Final Environmental Impact Report for the Midpeninsula Regional Open Space District Integrated Pest Management Program, which was approved by the Board on December 10, 2014.

NEXT STEPS

Toxicological review of the additional pesticide will be completed by the end of the fiscal year. After the review, additional CEQA review will be completed and the recommended pesticide products brought to the full Board for possible inclusion on the List of Approved Pesticides.

Attachment

1. IPM Annual Report, 2016

Responsible Department Head:
Kirk Lenington, Natural Resources

Prepared by:
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2016

Annual IPM Report



Integrated Pest Management Program Goal:

“Control Pests by consistent implementation of IPM principles to protect and restore the natural environment and provide for human safety and enjoyment while visiting and working on District lands.”

Coty Sifuentes-Winter

Midpeninsula Regional Open Space District

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Figure 2: Pre-Bid tour with weed contractors

1 Introduction

This report presents the results of the second year of pest management activities prescribed under the Midpeninsula Regional Open Space District (District) Integrated Pest Management (IPM) Program. The Program was established in 2014 upon adoption by the Board of Directors of the IPM Guidance Manual. Five policies set the foundation of the Program:

- Develop specific pest management strategies and priorities that address each of the five work categories;
- Take appropriate actions to prevent the introduction of new pest species to District preserves, especially new invasive plants in natural areas, rangeland, and agriculture properties;
- Manage pests using the procedures outlined in the implementation measures;
- Monitor pest occurrences and results of control actions and use adaptive management to improve results;
- Develop and implement an IPM Guidance Manual to standardize pest management and IPM procedures across all District Lands.



Figure 3: Spray truck

2 Implementation of IPM Program

The second year of planned implementation actions was completed successfully. Full implementation of the IPM Program should be completed by December of 2018. Major aspects of the IPM Program to be developed include a landscape monitoring protocol and an Early Detection / Rapid Response Program.



Figure 4: Bergman residence (Russian Ridge OSP) lacking defensible space.

3 Summary of Pest Problems

This section is a summary of pest problems that the District has encountered during the year.

3.1 Ongoing and General Maintenance

Thirty-three (33) pest species found on District lands are treated on an on-going basis (Table 1) to control for asset based protection and long-term management, an increase of two (2) species from 2015. These species have the potential to invade natural areas and displace native plant and wildlife species and reduce biodiversity. Of the listed species, seventeen (17) are considered noxious weeds by the State of California (Table 2), an increase of five (5) from 2015.

Table 1: Ongoing and general maintenance pest species

Scientific Name	Common Name	Cal-IPC rating	CDFA rating	Alert	Additional Information
<i>Acacia melanoxylon</i>	Blackwood acacia	Limited	-	-	
<i>Aegilops cylindrica</i>	Jointed goatgrass	-	Noxious Weed	-	
<i>Aegilops triuncialis</i>	Barbed goatgrass	High	Noxious Weed	-	
<i>Baccharis pilularis</i>	Coyote brush	-	-	-	Native, grassland conversion
<i>Brachypodium sylvaticum</i>	Slender false brome	Moderate	Noxious Weed	ALERT	
<i>Carduus pycnocephalus</i>	Italian thistle	Moderate	Noxious Weed	-	
<i>Carthamus creticus</i>	Smooth distaff thistle	-	Noxious Weed	-	
<i>Carthamus lanatus</i>	Woolly distaff thistle	Moderate	Noxious Weed	ALERT	
<i>Centaurea calcitrapa</i>	Purple star thistle	Moderate	Noxious Weed	-	
<i>Centaurea melitensis</i>	Tocalote	Moderate	Noxious Weed	-	
<i>Centaurea solatitialis</i>	Yellow star thistle	High	Noxious Weed	-	
<i>Cirsium vulgare</i>	Bull thistle	Moderate	Noxious Weed	-	
<i>Cistus incanus</i>	Hairy Rockrose	-	-	-	Non-native
<i>Conium maculatum</i>	Poison hemlock	Moderate	-	-	
<i>Cotoneaster franchetii</i>	Francheti cotoneaster	Moderate	-	-	
<i>Cytisus scoparius</i>	Scotch broom	High	Noxious Weed	-	
<i>Delairea odorata</i>	Cape Ivy	High	Noxious Weed	-	
<i>Dipsacus fullonum</i>	Fuller's teasel	Moderate		-	
<i>Dipsacus sativus</i>	Indian teasel	Moderate		-	

Scientific Name	Common Name	Cal-IPC rating	CDFA rating	Alert	Additional Information
<i>Dittrichia graveolens</i>	Stinkwort	Moderate	Noxious Weed	ALERT	
<i>Genista monspessulana</i>	French Broom	High	Noxious Weed	-	
<i>Hedera helix</i>	English ivy	High	-	-	
<i>Hirschfeldia incana</i>	Short podded mustard	Moderate		-	
<i>Phalaris aquatica</i>	Harding grass	Moderate	-	-	
<i>Phytophthora ramorum</i>	Sudden Oak Death	-	-	-	Quarantine
<i>Rubus armeniacus</i>	Himalayan blackberry	High	-	-	
<i>Silybum marianum</i>	Milk thistle	Limited	-	-	
<i>Spartium junceum</i>	Spanish Broom	High	Noxious Weed	-	
<i>Stipa miliacea</i>	Smilo grass	Limited	-	-	non-native
<i>Taeniatherum caput-medusae</i>	Medusa head	High	Noxious Weed	-	
<i>Ulex europaeus</i>	Gorse	High	Noxious Weed	-	
<i>Vinca major</i>	Periwinkle	Moderate	-	-	
<i>Xanthium spinosum</i>	Spiny cocklebur	-	-	-	Native, California red-legged frog habitat areas

Table 2: Treated Species by Rating for Ongoing and New Projects

Year	Species Treated	Cal-IPC Rating			CDFA Rated	Alert
		Limited	Moderate	High		
2016	33	3	14	10	17	3
2015	31	4	12	8	12	4

3.2 New Pest Control Projects

Potential pest control projects were submitted to the IPM Coordinator using the Districts New Pest Control Project. Potential projects were evaluated using the Project Ranking System developed by the IPM Coordination Team. The Project Ranking System evaluates projects using five categories:

- Safety,
 - Human health,
 - Environmental health,
- Prevents and controls the most destructive pests,
- Protection of biodiversity,
- Provides for public engagement,
- And is feasibility and effectiveness.



Figure 5: Hand pulling slender false brome at El Corte de Madera

Twelve (12) new pest control projects were determined to have high priority for treatment on District lands (Table 3). In addition, multiple projects at Bear Creek Redwoods were initiated in anticipation of it's opening to the public in 2018.

Table 3: New Pests Control Projects

Scientific Name	Species	Cal-IPC rating	CDFA rating	Alert	Gross Acres	Infested Acres
Acacia dealbata	Silver wattle	Moderate		-	0.1	0.01
Aegilops triuncialis	Barbed goatgrass	High	Noxious	-	4.5	2.41
Brachypodium sylvaticum	Slender false brome	Moderate	Noxious	ALERT	0.1	0.01
Centaurea calcitrapa	Purple star thistle	Moderate	Noxious	-	10.7	1.07
Centaurea solstitialis	Yellow star thistle	High	Noxious	-	38.3	3.83
Crocsmia xcrocsmiiflora	Montbretia	Limited	-	-	0.1	0.01
Dittrichia graveolens	Stinkwort	Moderate	Noxious	ALERT	0.2	0.02
Genista monspessulana	French Broom	High	Noxious	-	1.1	0.05

4 Summary of Pest Control Treatments

4.1 Type of Control with Cost per Acre

Treatment area and hours are not available for staff in 2016 due to data collection protocol under revision. The following data is for natural areas and does not take into account brushing/mowing of roads, trails, defensible space, or emergency landing zones. Brushing/mowing of roads, trails, defensible space, or emergency landing zones is not presented because these activities do not change from year to year.

Table 4: Treatment Methods and Hours in Natural Areas

Treatment Method	Staff ¹	Hours Contractor	Volunteer	Total
Brush Cut	Transitional Year	365	0	365
Cut		54	316	370
Dig		299	415	714
Flame		0	0	0
Herbicide		598	0	598
Pull		343	2152	2495
TOTAL	-	1659	2883	4542

Total hours shown on Table 4 are underreported due to staff hours and acreage not being recorded. Staff training on the use of the CalFlora data has been scheduled for spring of 2017. By April of 2017, all work performed will be memorialized and accessible to the public on CalFlora.

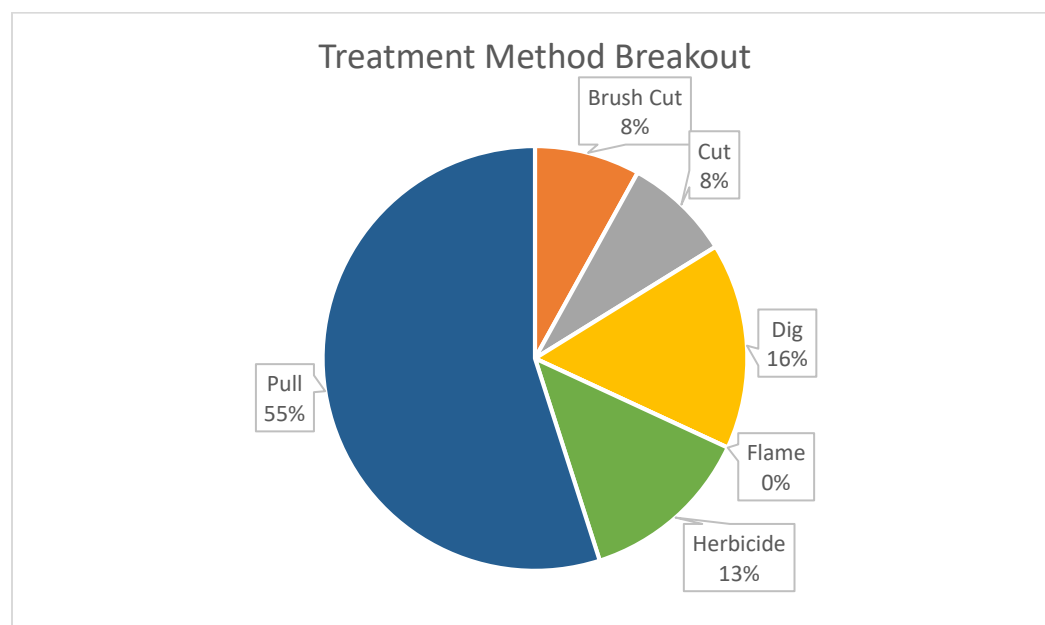


Figure 6: Treatment Method Breakout

¹ Staff Hours were not recorded into the Weed Database or CalFlora as this was a transitional year from one database to another.

Manual removal of weeds via pulling remains the most prevalent treatment method at 55% of all hours; herbicide accounts for 13% of all hours (Figure 4).

Future reports will present total summaries of treatment cost per acre; however, data analysis is only available for “Cost per acre” with use of contractors. As data is made available with the use of the CalFlora Database, additional analysis will occur in future years.

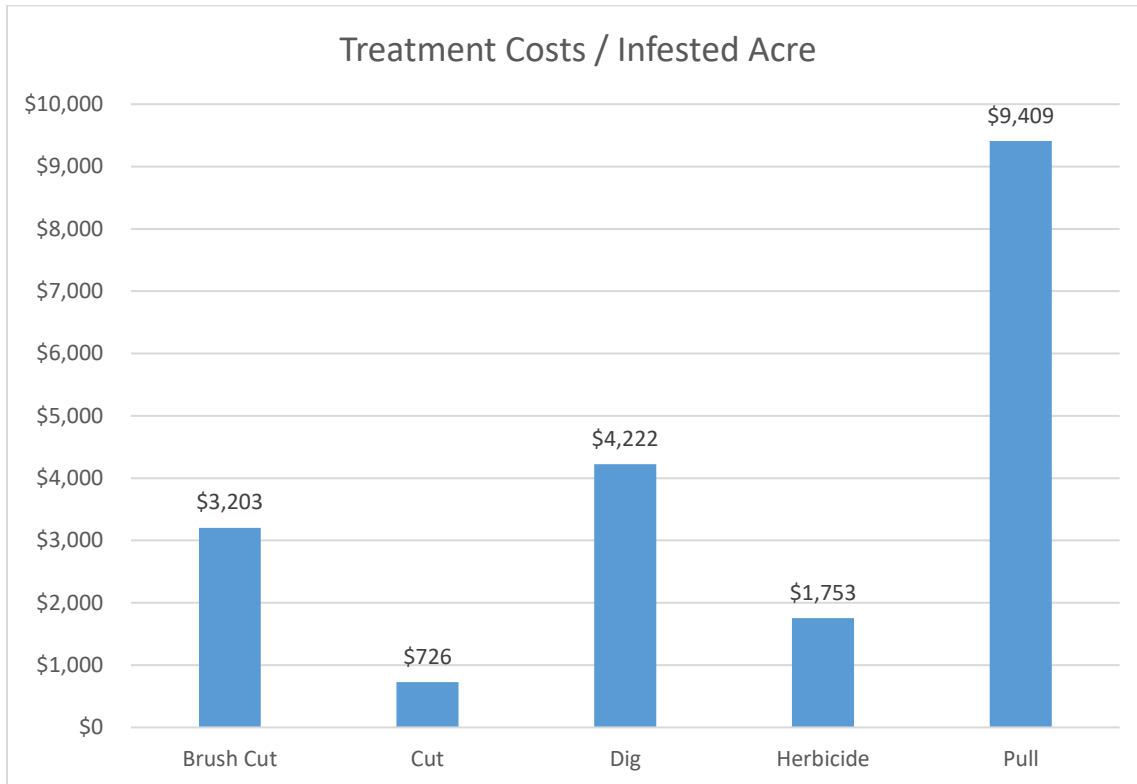


Figure 7: Treatment Cost per Acre. Data Compiled only from contractor costs and acreage.

5 Effectiveness of Pest Control Program

The IPM Program identified criteria for assessing the program every year primarily regarding:

- Work health/exposure in buildings,
- Reduction of pesticide use in buildings,
- Per-acre herbicide use,
- Preservation of biodiversity and natural resource values,
- Public participation in pest control,
- And staff training, public outreach, and educational activities.

As data from consecutive years becomes available in the future, the IPM Annual Report will evaluate the reduction of the amount of herbicide used at individual sites in natural areas over time. Baseline data is becoming available to use in future years. Actions undertaken in 2015 to meet these criteria are described below.

5.1 Worker Health/Exposure in Buildings

The District is committed to the use of lower pesticide worker health/exposure classifications in buildings and recreational structures. Pesticides used in buildings and at recreational structures in 2015 were consistent with the 6 approved structural pesticides (Table 5) for the 2014 IPM Program Environmental Impact Report, all of which are caution label and therefore pose a reduced risk to workers or occupants of treated buildings. A specific type of rodenticide bait is approved under very strict conditions, however, it was not prescribed and only prevention and traps were approved for rodent control in 2015. In addition, one application of Termidor HE (Caution label, with fipronil as the active ingredient) was used at the Administration Building for termites on December 17, 2015. Although termite control was not evaluated in the original IPM program, fipronil was an approved active ingredient evaluated for insect control under the original IPM Program and it was determined to be suitable for this particular project and consistent with the intent and environmental review of the IPM Program.

Table 5: Pesticides Approved for Use in Buildings and Recreational Structures

Pesticide Category	Active Ingredient	Product Formulation	Purpose	Signal Word
Rodenticide	Cholecalciferol	Cholecalciferol baits	Rodent control	Caution
Insecticide ²	Indoxacarb	Advion Gel baits	Structural pest control	Caution
	Hydroprene	Gentrol Point Source	Pest Control	Caution
	Fipronil	Maxforce Bait Station	Ant Control	Caution

² Employees, contractors and tenants may install approved ant and roach bait stations inside buildings in tamperproof containers without review by a Qualified Applicator License/Certificate holder.

	Sodium tetraborate	Terro Ant Killer II	Ant Control	Caution
	Diatomaceous earth	Diatomaceous earth	Structural pest control	Caution

5.2 Reduction of Pesticide Use in Buildings

The District seeks to comprehensively oversee all pesticide use in and around District buildings, including use by tenants, which is expected to result in an overall reduction of pesticide use in buildings, and in particular, eliminate use of pesticides not appropriate for use around human occupants or visitors, or which can inadvertently escape into the surrounding wildland environment.

Since this is the first year of the IPM Program, there are no reliable numbers for comparing to structural pesticide use in prior years. Of several rodent and insect infestations in buildings reviewed this year, the IPM Coordinator was able to evaluate site-specific conditions and recommend sanitary practices for prevention and physical controls using snap traps.

5.3 Per-acre Herbicide Use

The District seeks a reduction in per-acre usage of herbicides over time at individual sites, but acknowledges that in some instances, use will initially increase, followed by a reduction in herbicide use when the pest is eliminated or reduced. Use of herbicides in natural areas was precautionary but comparative numbers cannot be provided until next year when work and data collection are conducted in a manner consistent with IPM from year to year. A trend analysis will be performed after four years of data has been compiled. Baseline data is available for the following preserves:

- Bear Creek Redwoods
- La Honda Creek
- Los Trancos
- Rancho San Antonio
- Russian Ridge
- Sierra Azul
- Skyline Ridge
- Thornewood

Below is base line data for three select preserves:

Table 6: Herbicide Use at Bear Creek Redwoods

Herbicide	Ounces Used	Acres	Per Acre Usage
Aminopyralid	1.482	1,437	0.001
Clethodim	0		0
Clopyralid	0		0
Glyphosate	101.85		0.071
Imazapyr	243.32		0.169

Table 7: Herbicide Use at Los Trancos

Herbicide	Ounces Used	Acres	Per Acre Usage
Aminopyralid	4.328	274	0.016
Clethodim	0		0
Clopyralid	0		0

Glyphosate	28.25		0.103
Imazapyr	0		0

Table 8: Herbicide use at Skyline Ridge

Herbicide	Ounces Used	Acres	Per Acre Usage
Aminopyralid	0	2,143	0
Clethodim	0		0
Clopyralid	3.075		0.001
Glyphosate	0		0
Imazapyr	0		0

5.4 Preservation of Biodiversity and Natural Resource Values

Below, District staff provides an annual qualitative assessment of natural resources conditions of IPM projects in natural areas, rangelands, and agricultural properties in the Annual IPM Report.



Figure 8: French broom seedlings at the Apple Orchard (La Honda OSP).

5.4.1 Natural Areas

In natural areas, herbicide and non-herbicide methods were used to control high priority invasive plants to protect and restore native vegetation at preserves. Qualitative observations of note:

5.4.1.1 Mindego Hill

In 2016, efforts to control purple star thistle, *Centaurea calcitrapa*, and smooth distaff thistle, *Carthamus creticus* continued in the Mindego Hill area of the Russian Ridge Open Space Preserve. The amount of purple

star thistle continues to decline and most plants occur in scattered locations throughout the three pastures. However, smooth distaff thistle continues to be prominent in the Kneudler Lake area and should be reassessed to determine better timing and methods of control.

Prior to any herbicide work for the 2016 season, a volunteer project was completed on April 7th to remove purple star thistle and smooth distaff thistle rosettes along the newly opened Mindego Hill Trail. Contractor crews completed herbicide treatment with Milestone and hand removal on scattered purple star thistle plants in the rosette or bolting stage in all areas except Kneudler Lake by mid-June.



Figure 9: Contractors searching for Distaff thistle at Kneudler Lake. A. Mills

In addition to a decrease in purple star thistle, the United States Geological Survey (USGS) biologist conducting field studies on the endangered San Francisco Garter Snakes had a record year at Mindego Lake observing and marking 210 SFGS snakes. The population of SFGS in the Mindego Hill area continues to increase and efforts to enhance its habitat by controlling purple star thistle may be a contributing factor.

The Big Springs area of Mindego Hill had a few scattered purple star thistle plants that were removed by hand. A small population of French broom will need continued follow-up so the Big Springs area should be swept every year for these invasive weeds.

Smooth distaff thistle continues to be widespread throughout the Kneudler Lake area, and a few scattered plants were also located along the Mindego Hill Trail. The contractor crew completed an initial treatment with Milestone on bolting distaff thistle in the Kneudler Lake area in the beginning of June. Since the access road

had not been mowed and fire danger increased, treatment was delayed until early July after Skyline maintenance staff mowed the access road. The initial treatment of distaff thistle in early June with Milestone proved to be ineffective after 4 weeks when the site was checked in early July. Results may have improved by waiting an additional 2 weeks to see the herbicide effects, but by early July distaff thistle in the area was already producing viable seed and the remaining distaff thistle was dug up with shovels and placed in piles for composting.

In future years, it is recommended that distaff thistle be treated in rosette stage earlier in the season. At Mindego Hill distaff thistle can start producing viable seed by the end of June or early July and should be treated with herbicide or dug up prior to bolting.

5.4.1.2 Driscoll Ranch

In 2016, efforts to control purple star thistle, *Centaurea calcitrapa*, continued in the Driscoll Ranch area of La Honda Open Space Preserve. The primary focus of purple star thistle removal continues to be in pastures 4, 5 and 6, and along Sears Ranch Road and small portions of pastures 1 and 2. Purple star thistle is declining in these target areas and in general plants are scattered throughout the landscape. Areas around the Wool house were added as a priority for treatment in 2016 due to the scheduled demolition activities in the fall of 2016.

The contractor crew completed hand removal of purple star thistle rosettes during the month of March due to rains and saturated soils. Hand removal initially focused on Pasture 4 around upper and lower Turtle Ponds, and near any creeks, drainages, or other areas that hold water during the wet months. A complete sweep of pasture 4 allowed for hand removal of all purple star thistle rosettes encountered in March. A patch of French broom along a drainage was also pulled.



Figure 10: Purple star thistle at Driscoll Ranch. A. Mills

After completing hand removal in pasture 4, a sweep of Sears Ranch Road and small portions of pasture 1 and 2 that border Sears Ranch Road was completed to hand remove any purple star thistle rosettes encountered. The contractor crew continued to sweep through all areas of pasture 5 and 6 to complete hand removal. Purple star thistle is mostly scattered along the road edges in pastures 5 and 6. A small population of smooth distaff thistle in pasture 6 is located along the road going to the former Wool House past pond DR06 and was removed with shovels. The Wool house area has a much higher density of purple star thistle rosettes than other priority treatment areas and these were removed by hand and treated with Milestone prior to demolition activities.

A follow-up herbicide treatment with Milestone occurred later in the season in May to treat any plants that had been missed throughout the target areas. Purple star thistle continues to decline in Pasture 4, 5, and 6 and most plants occur in scattered locations, especially along roads and near ponds. Some areas around lower Turtle Pond have higher densities of purple star thistle and these areas should continue to be targeted to help enhance habitat for the California red-legged frog and western pond turtle. Removal of small rosettes by hand early in the season and continued follow-up is an effective way to continue to enhance these priority areas.

In addition to contractor hand removal and herbicide applications, at least one volunteer project focused on hand removal of invasive species around pond DR06. Volunteers provide additional means of controlling invasive, non-native weed species especially in areas where herbicide application cannot be completed. Volunteer projects should continue to occur in areas around the ponds to enhance habitat for the California red-legged frogs.

Treatment of purple star thistle should continue to occur in priority areas of pastures 4, 5 and 6, along Sears Ranch Road, and small portions of pastures 1 and 2 along Sears Ranch Road. As staff availability and contractor funding and availability allow, treatment of purple start thistle should continue to extend further into the preserve. Target areas should focus on areas that will be open to the public in the Fall of 2016 to prevent further spread of these non-native invasive weeds.

5.4.2 Rangeland

Midpen uses conservation grazing to manage fuel (flammable vegetation) for fire protection; enhance the diversity of native plants and animals; help sustain the local agricultural economy; and foster the region's rural heritage. Midpen uses conservation grazing on approximately 10,800 acres as a tool to manage grassland habitat on portions of these five preserves:

- Russian Ridge Open Space Preserve
- Skyline Ridge Open Space Preserve
- Purisima Creek Redwoods Open Space Preserve
- Tunitas Creek Open Space Preserve
- La Honda Creek Open Space Preserve

In the absence of natural disturbance (i.e. fire), the District periodically does brush removal on grasslands to slow the encroachment.



Figure 11: October Farms 2015



Figure 12: October Farms 2016

5.4.3 Agricultural Properties

Assessment of agricultural properties, which represent a very small area of District land, will begin in May of 2017.

5.5 Summary of Public Participation in Pest Control

The public is an integral part of the success of the IPM program. In particular, volunteers who assist with invasive plant identification and control are a valuable asset to the IPM program. In 2016, the District's Preserve Partner volunteers contributed 2,685 hours to Resource Management through eighty-three outdoor service projects. The District hosted twenty-one Special Group projects, a subset of the Preserve Partners, which include school groups, technology companies, scout troops, running clubs and community groups. Preserve Partner projects were held in nineteen open space preserves.

Preserve Partner projects focused primarily on invasive plant control addressing twenty invasive species: French broom, Spanish broom, English ivy, slender false brome, purple star thistle, yellow star thistle, Italian thistle, bull thistle, hemlock, teasel, cocklebur, stinkwort, summer mustard, coyote brush, barbed goat grass, jointed goat grass, medusa head, tocalote, harding grass, and jubata grass. French broom removal dominated Preserve Partner projects with French broom removal projects taking place in twelve open space preserves.



Figure 13: Advanced Resource Management Stewards tackle broom at St. Joseph's Hill

There were twenty-four active Advanced Resource Management Stewards (ARMS) in 2016. The ARMS volunteers work independently on resource management projects on their own time. To attack key populations of invasive plants more effectively, the Volunteer Program Lead recruits the ARMS for mobile "strike teams". In 2016, fifteen ARMS "strike teams" were deployed. In total, the ARMS volunteers contributed 1,291 hours to resource management with project sites located in twenty open space preserves.

The Volunteer Program Manager formalized stewardship partnerships with three organizations in 2016: Grassroots Ecology, (formerly Acterra), Village Harvest, and the Student Conservation Association. Grassroots Ecology contributed 662 hours of resource management at two sites: French broom removal in the Windy Hill Open Space Preserve at the Hawthorns along Portola Rd. and yellow star thistle at the Russian Ridge Open Space Preserve parking lot. Village Harvest contributed 150 hours of resource management in the orchard at the Steven's Canyon Ranch in the Saratoga Gap Open Space Preserve. The Student Conservation Association contributed 288 hours of resource management over five project days at five different open space preserves.

5.6 Summary of Staff Training, Public Outreach, and Educational Activities

5.6.1 Staff Training

The mandatory annual Pesticide Safety and Training was held at both field offices in May of 2016. All California Department of Pesticide Regulation required training information was presented by the District's Pest Control Advisor (PCA), Mark Heath of Shelterbelt Builders, Inc.

In October 2016, the IPM coordinator, Resource Management Specialist I, Volunteer Program Lead, and Maintenance Supervisor participated in the annual California Invasive Species Council symposium.

5.6.2 Public Outreach

5.6.2.1 *ABC News*

On September 3, 2016, the District IPM Coordinator was interviewed by ABC News on the use of the smart phone app, iNaturalist. iNaturalist is a citizen scientist tool for documenting location of plant species.

5.6.2.2 *Open Space Views newsletter*

- *Teaming up with Acterra to Bring New Volunteers to Open Space*
- (Mailing list: 14,413; Email list: 4,275)

5.6.2.3 Facebook Posts

Over the past six years, Louise Addis, Linda Schweizer, and Kathi Olsen (not pictured), representatives of the Grandview Neighborhood Association have assisted Midpen and the [San Mateo County Resource Conservation District](#) in the preservation and restoration of the Santa Cruz Mountains' redwood forests. This included removing A LOT of the noxious weed, Slender False Brome. Kudos to the "Ladies of Grandview" who were awarded the California Association of Resource Conservation Districts 2015 Volunteer of the Year award!



January 24, 2016

1,763 people reached; 31 Likes, Comments & Shares

You think weeding your garden is hard? Try wrestling these invasive species out of the ground! That's just one of the many things our volunteers do at our Outdoor Service Projects. Come out and join us sometime. Find out how to join us: <http://www.openspace.org/outdoor-service-projects>



February 8, 2016

124 People Reached; 4 Likes, Comments & Shares

Did you know that livestock grazing provides a number of benefits to the grasslands in our preserves? Cattle grazing promotes the growth of desirable vegetation such as wildflowers and native grasses, helps control invasive weeds, enhances habitat for sensitive wildlife species such as the California red-legged frog, and helps to reduce fine fuels to minimize the risk of catastrophic wildfire.

Last year Midpen reintroduced cattle grazing as a resource management tool on the Mindego Hill portion of the Russian Ridge OSP. You may encounter some cattle on the new trail to the top of Mindego Hill opening at the end of March!



March 7, 2016

2,049 People Reached; 62 Likes, Comments & Shares

5.6.2.4 Twitter

Our weeds are bigger than your weeds! Help us battle invasive species. bit.ly/1PYkQ9v



RETWEETS

2

LIKES

4



10:22 AM - 8 Feb 2016

Behold the lowly weed wrench. Important tool in the fight against French Broom!

[#InvasiveSpeciesWeek](#)



RETWEET
1

LIKE
1



9:53 AM - 26 Feb 2016

Cattle grazing promotes the growth of desirable vegetation and helps control weeds.

bit.ly/24C4ZbB



© Cindy Roessler

LIKE
1



10:40 AM - 9 Mar 2016

6 Summary of Pesticide Use

The reporting of pesticide use on District lands includes the following entities:

- Staff
- Contractors
- Tenants

The following tables summarizes the known use of pesticides on District lands, excluding PG&E which is not covered under the District's Integrated Pest Management Program, but is still required to report pesticide use to each County Agricultural Department.

<i>Pesticide</i>	<i>Active Ingredient</i>	<i>Product Used (oz)</i>	<i>Acres Treated</i>	<i>Oz / Acre</i>	<i>Max Legal Rate (oz. per 36" tree)³</i>
<i>Fungicide (preventative treatment for Sudden Oak Death)</i>	Potassium salts of phosphorus acid	5,011.2	22.6	221.7	256 Oz.

<i>Pesticide</i>	<i>Active Ingredient</i>	<i>Product Used</i>	<i>Acres Treated</i>	<i>Oz / Acres³</i>	<i>Max Legal Rate⁴ (Oz/Acre)</i>
<i>Herbicide</i>	Aminopyralid	9.07	26.44	0.34	7.0
	Clethodim	0.00	0.00	-	26
	Clopyralid	3.08	1.90	1.62	10.7
	Glyphosate	3677.10	Unable to Determine ⁵	-	224
	Imazapyr	243.32	15.06	16.16	48

<i>Pesticide</i>	<i>Active Ingredient</i>	<i>Product Used (oz)</i>	<i>Acres Treated</i>	<i>Oz / Acre</i>
<i>Insecticide</i>	Pyrethrin	420	N/A	N/A

<i>Pesticide</i>	<i>Active Ingredient</i>	<i>Product Used (oz)</i>	<i>Acres Treated</i>	<i>Oz / Acre</i>
<i>Rodenticide</i>	Cholecalciferol	0	0	N/A

³ Ounces per acre can only be compared when product formulations have the same Active Ingredient. For example, the rate for Roundup ProMax with glyphosate as the Active Ingredient is 32 to 160 oz per acre. The rate for Milestone with Aminopyralid as the Active Ingredient is 3 to 7 oz per acre.

⁴ Maximum legal rate is the maximum amount of product that can legally be used per the label of the product.

⁵ Unable to determine area treated from staff with Roundup due to data protocol transition to CalFlora.

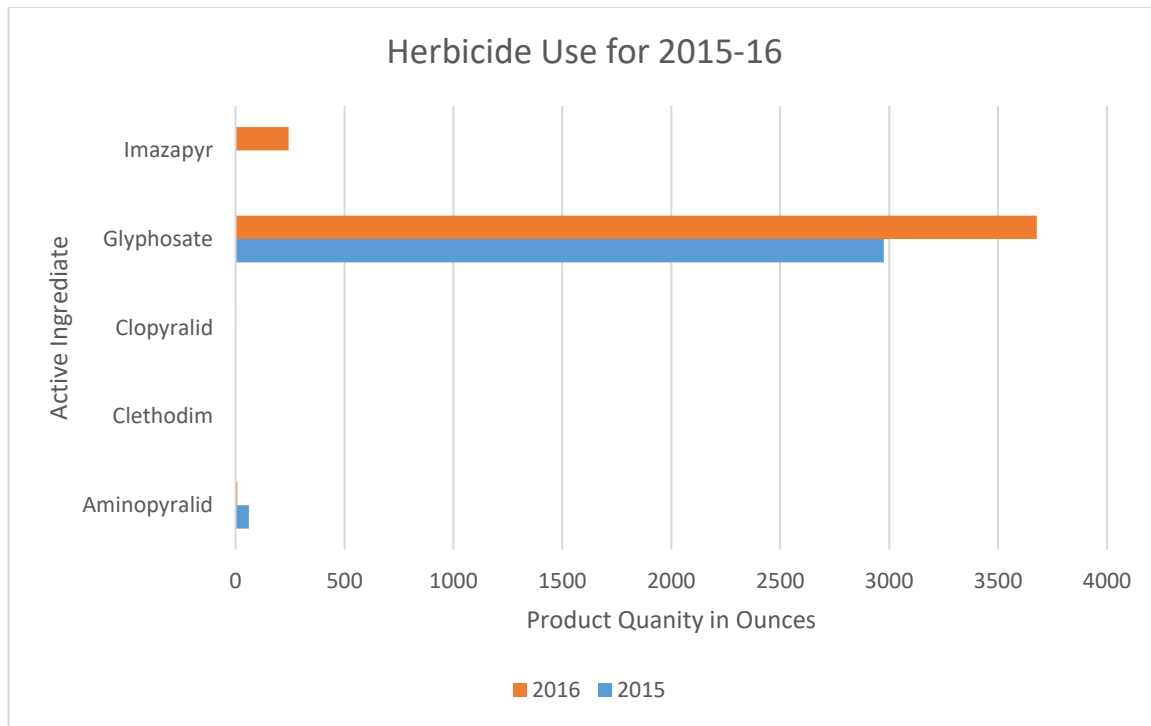


Figure 14: Herbicide use from 2015 through 2016

Herbicide use increased over the previous year. This increase is the direct result of intensive invasive species work at Bear Creek Redwoods.

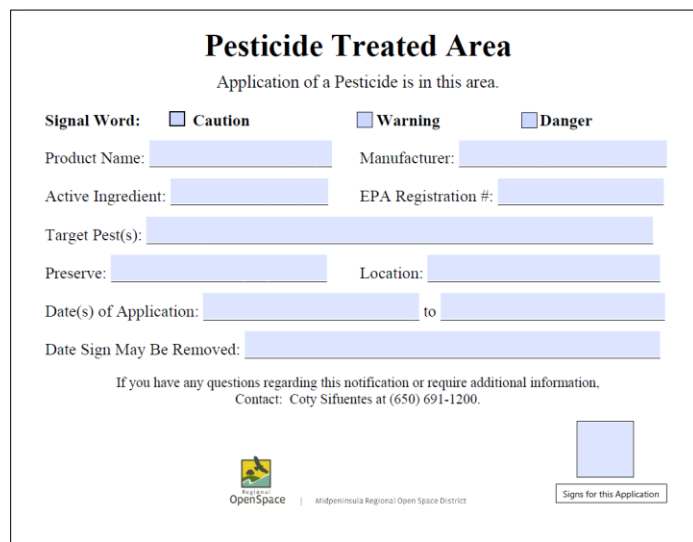
7 Public Interactions

7.1 Notifications

7.1.1 Pesticide Applications

Prior, during, and after the application of a pesticide (including herbicides, insecticides, or other types of pesticides) on District preserves, employees or contractors post signs at the treatment area notifying the public, employees and contractors of the District's use of pesticide. Posting periods designated below are the District's minimum requirements; signs may be posted earlier and left in place for longer periods of time if it serves a public purpose or if it provides staff flexibility in accessing remote locations.

- For pesticide application in outdoor areas of all District-owned preserves and in buildings which are not occupied or are rarely visited (e.g. pump houses), signs are posted at the treatment areas 24 hours before the start of treatment until 72 hours after the end of treatment. Signs stating "Pesticide Use Notification" are placed at each end of the outdoor treatment area and any intersecting trails.
- For urgent application of pesticides to control stinging insects, signs are posted at the treatment area 72 hours after the end of treatment, but no pre-treatment posting is required.
- For pesticide application in occupied buildings such as visitor centers, offices and residences, notification is provided to building occupants (employees, visitors, residents) 24 hours before the start of treatment by email, letters or telephone calls. Additionally, for buildings which might be visited by more than just a single family, signs stating "Pesticide Use Notification" will be placed at the entrances to the building 24 hours before the start of treatment until 72 hours after the end of treatment. The use of approved insecticidal baits in tamper-proof containers require notification 24 hours before the start of treatment by email, letters or telephone calls, but will not require posting of signs.
- The information contained in the pesticide application signs include: product name, EPA registration number, target pest, preserve name and/or building, date and time of application, and contact person with telephone number. The contact person is the IPM Coordinator.
- On lands that the District manages but does not own (e.g., Rancho San Antonio County Park), the District will provide notification of pesticide use in the same manner and applying the same actions as it does with its properties, unless the contracting agencies have adopted more restrictive management



Pesticide Treated Area
Application of a Pesticide is in this area.

Signal Word: ☐ Caution ☐ Warning ☐ Danger

Product Name: Manufacturer:

Active Ingredient: EPA Registration #:



Target Pest(s):

Preserve: Location:

Date(s) of Application: to

Date Sign May Be Removed:

If you have any questions regarding this notification or require additional information,
Contact: Coty Sifuentes at (650) 691-1200.

San Mateo County Regional Open Space District | Signs for this Application

Figure 15: Pesticide Notification Sign

standards. In those cases, the more restrictive management standards would be implemented by the District.

- In the event of an immediate public safety concern, notification occurs at the time of treatment but pre-posting may not be possible.

All contractors notify the District before application on any property, and comply with requirements for notification and posting of signs described above.

At the discretion of the District staff and depending on the site conditions, neighboring landowners are notified if the District is conducting pest management near a property line.

7.2 Inquiries

None to Report.



Figure 16: French broom piles at Bear Creek Redwoods

8 Consultants and Contractors

8.1 CalFlora - \$20,000

Cloud-based database for georeferenced data on plant species and the work performed on District-managed properties by staff, contractors, and volunteers.

8.2 Confluence Restoration - \$15,780

Mindego Gateway (Russian Ridge Open Space Preserve) plant maintenance and weeding.

8.3 Ecological Concerns, Inc. - \$204,900

Treatment of various weeds at Bear Creek Redwoods, La Honda, Los Trancos, Russian Ridge, and Skyline Ridge Open Space Preserves.

8.4 Shelterbelt Builders, Inc. - \$5,690

Preparation of Pest Control Recommendations and the annual pesticide safety-training requirement.

9 Compliance with Guidance Manual

9.1 Effectiveness of Changes

9.2 Experimental Pest Control Projects

9.2.1 Barbed Goat Grass (*Aegilops triuncialis*)

A population of barbed goat grass was found and identified by Stan Hooper at Long Ridge Open Space Preserve. Originally, it was mapped at about two gross acres in 2015. Treatment started in 2016 and it was determined at that time that the infestation was much larger than previously thought, 6.5 gross acres of which 2.5 acres are infested. The District is treating with two timed mows during late spring with follow up by volunteers to hand pull any remaining re-sprouts. The District plans to experiment with other treatment options in 2018, specifically the use of Roundup Pro Max and Envoy Plus.

9.2.2 Slender False Brome (*Brachypodium sylvaticum*)

In spring of 2016, the District begun consultation with Santa Clara University to set up an experiment looking at non-herbicide and herbicide options on slender false brome. Test plots on a private property has been set up. Results are expected in three years.

9.3 Changes to Guidance Manual or Control

9.3.1 Updating the List of Approved Pesticides

The List of Approved Pesticides is intended to change over time as the science of pest control advances and more effective, safer, and less harmful pesticides are developed; as manufacturers update, discontinue, or substitute products; and as the District's target pests change over time.

9.3.2 Product Substitutions

When manufacturers substitute a product or change a product name or formulation, but when the active ingredient stays the same, the new product can be substituted for the old product on the List of Approved Pesticides. In general, this type of change to the list would not trigger a change in condition or result in the need for additional environmental documentation. Therefore, this change typically will require a simple update to the List of Approved Pesticides.

9.3.2.1 Agri-Fos - Reliant

The District uses the fungicide, Agri-Fos, for the preventative treatment of sudden oak death. The fungicide Reliant has the same active ingredient, mono- and di-potassium salts of phosphorous acid and is available at a reduced price.

9.3.3 Product Eliminations

In instances where products on the list are no longer available from the manufacturer, are found to be ineffective against the District's target pests, or if new risks are discovered that were not previously evaluated by the District, a product may be eliminated from the List of Approved Pesticides. This type of

change requires an update to the List of Approved Pesticides, but does not require additional environmental review.

9.3.4 Product Additions

In instances where new products with new active ingredients are found to be safer, more effective, and/or less costly than products on the on the List of Approved Pesticides, the District may elect to add new pesticides. This type of change typically requires additional toxicological review, and depending on the results, may also require additional environmental review.

A toxicological review should be completed by the end of spring 2017 on four new pesticides:

- Insecticide
 - Python Dust Bag
 - Wasp Freeze II
- Herbicide
 - Garlon 4 Ultra
 - Capstone

After the toxicological review is completed, CEQA will be undertaken to evaluate selected pesticides. CEQA should be completed by fall of 2017 and brought to the full board for approval.

10List of Preparers and Contributors

Jean Chung, Property Management Specialist I
Kirk Lenington, Natural Resources Manager
Amanda Mills, Resource Management Specialist I
Coty Sifuentes-Winter, IPM Coordinator

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Cydney Bieber, Web Administrator
Brian Fair, Open Space Technician
Ellen Gartside, Volunteer Program Lead
Stan Hooper, Maintenance, Construction, and Resource Supervisor
Cindy Roessler, Senior Resource Management Specialist

Appendix A - District Best Management Practices

District BMPs for IPMP

BMP ID#	Best Management Practices
1	All pesticide use shall be implemented consistent with Pest Control Recommendations prepared annually by a licensed Pest Control Advisor.
2	Surfactants and other adjuvants shall be used and applied consistent with the District's Pest Control Recommendations.
3	Applicators shall follow all pesticide label requirements and refer to all other BMPs regarding mandatory measures to protect sensitive resources and employee and public health during pesticide application.
4	Pesticide applicators shall have or work under the direction of a person with a Qualified Applicator License or Qualified Applicator Certificate. Contractors and grazing and agricultural tenants may apply approved herbicides after review and approval by the District and under the direction of QAL/QAC field supervisors. Employees, contractors and tenants may install approved ant and roach bait stations inside buildings in tamper-proof containers without review by a QAL/QAC. Tenants may not use rodenticides; only qualified District staff or District contractors may use approved rodenticides and these should only be used in the event of an urgent human health issue and in anchored, tamper-proof containers inside buildings.
5	All storage, loading and mixing of herbicides shall be set back at least 300 feet from any aquatic feature or special-status species or their habitat or sensitive natural communities. All mixing and transferring shall occur within a contained area. Any transfer or mixing on the ground shall be within containment pans or over protective tarps.
6	Appropriate non-toxic colorants or dyes shall be added to the herbicide mixture to determine treated areas and prevent over-spraying.
7	<p>Application Requirements - The following general application parameters shall be employed during herbicide application:</p> <ul style="list-style-type: none"> ▲ Application shall cease when weather parameters exceed label specifications, when wind at site of application exceeds 7 miles per hour (MPH), or when precipitation (rain) occurs or is forecasted with greater than a 40 percent probability in the next 24-hour period to prevent sediment and herbicides from entering the water via surface runoff; ▲ Spray nozzles shall be configured to produce a relatively large droplet size; ▲ Low nozzle pressures (30-70 pounds per square inch [PSI]) shall be observed; ▲ Spray nozzles shall be kept within 24 inches of vegetation during spraying; ▲ Drift avoidance measures shall be used to prevent drift in locations where target weeds and pests are in proximity to special-status species or their habitat. Such measures can consist of, but would not be limited to the use of plastic shields around target weeds and pests and adjusting the spray nozzles of application equipment to limit the spray area.
8	Notification of Pesticide Application – Signs shall be posted notifying the public, employees, and contractors of the District's use of pesticides. The signs shall consist of the following information: signal word, product name, and manufacturer; active ingredient; EPA registration number; target pest; preserve name; treatment location in preserve; date and time of application; date which notification sign may be removed; and contact person with telephone number. Signs shall generally be posted 24 hours before the start of treatment and notification shall remain in place for 72 hours after treatment ceases. In no event shall a sign be in place longer than 14 days without dates being updated. See the IPM Guidance Manual for details on posting locations, posting for pesticide use in buildings and for exceptions.
9	Disposal of Pesticides – Cleanup of all herbicide and adjuvant containers shall be triple rinsed with clean water at an approved site, and the rinsate shall be disposed of by placing it in the batch tank for application. Used containers shall be punctured on the top and bottom to render them unusable, unless said containers are part of a manufacturer's container recycling program, in which case the manufacturer's instructions shall be followed. Disposal of non-recyclable containers shall be at legal dumpsites. Equipment shall not be cleaned and personnel shall not bathe in a manner that allows contaminated water to directly enter any body of water within the treatment areas or adjacent watersheds. Disposal of all pesticides shall follow label requirements and local waste disposal regulations.
10	All appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and local jurisdictions shall be followed. All applications shall adhere to label directions for application rates and methods, storage, transportation, mixing, and container disposal. All contracted applicators shall be appropriately licensed by the state. District staff shall coordinate with the County Agricultural Commissioners, and all required licenses and permits shall be obtained prior to pesticide application.
11	Sanitation and Prevention of Contamination - All personnel working in infested areas shall take appropriate precautions to not carry or spread weed seed or plant and soil diseases outside of the infested area. Such precautions will consist of, as necessary based on site conditions, cleaning of soil and plant materials from tools, equipment, shoes, clothing, or vehicles prior to entering or leaving the site.
12	All staff, contractors, tenants, and volunteers shall be properly trained to prevent spreading weeds and pests to other sites.
13	District staff shall appropriately maintain facilities where tools, equipment, and vehicles are stored free from invasive plants.

District BMPs for IPMP

BMP ID#	Best Management Practices
14	District staff shall ensure that rental equipment and project materials (especially soil, rock, erosion control material and seed) are free of invasive plant material prior to their use at a worksite.
15	Suitable onsite disposal areas shall be identified to prevent the spread of weed seeds.
16	Invasive plant material shall be rendered nonviable when being retained onsite. Staff shall desiccate or decompose plant material until it is nonviable (partially decomposed, very slimy, or brittle). Depending on the type of plant, disposed plant material can be left out in the open as long as roots are not in contact with moist soil, or can be covered with a tarp to prevent material from blowing or washing away.
17	District staff shall monitor all sites where invasive plant material is disposed on-site and treat any newly emerged invasive plants.
18	When transporting invasive plant material off-site for disposal, the plant material shall be contained in enclosed bins, heavy-duty bags, or a securely covered truck bed. All vehicles used to transport invasive plant material shall be cleaned after each use.
19	Aquatic Areas – A District-approved biologist shall survey all treatment sites prior to work to determine whether any aquatic features are located onsite. On a repeating basis, grassland treatment sites shall be surveyed once every five years and brushy and wooded sites shall be surveyed once every three years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Aquatic features are defined as any natural or manmade lake, pond, river, creek, drainage way, ditch, spring, saturated soils, or similar feature that holds water at the time of treatment or typically becomes inundated during winter rains. If during the survey it is found that aquatic features are present within 15 feet of the proposed treatment area, the District shall either eliminate all treatment activities within 15 feet of the aquatic feature from the project (i.e. do not implement treatment actions in those areas) or if the District chooses to continue treatment actions in these areas, it shall follow the requirements of the mitigation measure for special-status wildlife species and the CDFW Streambed Alteration Agreement.
20	Application of herbicides shall be conducted in accordance with the California Red-Legged Frog Injunction (Center For Biological Diversity v. U.S. Environmental Protection Agency (2006) Case No.: 02-1580-JSW) in known or potential California red-legged frog habitat specifically by: not applying specified pesticides within 15 feet of aquatic features (including areas that are wet at time of spraying or areas that are dry at time of spraying but subsequently might be wet during the next winter season); utilizing only spot-spraying techniques and equipment by a certified applicator or person working under the direct supervision of a certified applicator; and not spraying during precipitation or if precipitation is forecast to occur within 24 hours before or after the proposed application. Preserves in which these precautions must be undertaken are: Miramontes Ridge, Purisima Creek Redwoods, El Corte de Madera, La Honda Creek, Picchetti Ranch, Russian Ridge, Sierra Azul, Tunitas Creek, Skyline Ridge, Rancho San Antonio, Monte Bello and Coal Creek OSPs and Toto Ranch.
21	A District-approved biologist shall survey all selected treatment sites prior to work to determine site conditions and develop any necessary site-specific measures. On a repeating basis, grassland treatment sites shall be surveyed once every five years and brushy and wooded sites shall be surveyed once every three years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Site inspections shall evaluate existing conditions at a given treatment site including the presence, population size, growth stage, and percent cover of target weeds and pests relative to native plant cover and the presence of special-status species and their habitat, or sensitive natural communities. In addition, worker environmental awareness training shall be conducted for all treatment field crews and contractors for special-status species and sensitive natural communities determined to have the potential to occur on the treatment site by a District-approved biologist. The education training shall be conducted prior to starting work at the treatment site and upon the arrival of any new worker onto sites with the potential for special-status species or sensitive natural communities. The training shall consist of a brief review of life history, field identification, and habitat requirements for each special-status species, their known or probable locations in the vicinity of the treatment site, potential fines for violations, avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered.
22	Nesting Birds - For all IPM activities that could result in potential noise and other land disturbances that could affect nesting birds (e.g., tree removal, mowing during nesting season, mastication, brush removal on rangelands), treatment sites shall be surveyed to evaluate the potential for nesting birds. Tree removal will be limited, whenever feasible, based on the presence or absence of nesting birds. For all other treatments, if birds exhibiting nesting behavior are found within the treatment sites during the bird nesting season: March 15 – August 30 for smaller bird species such as passerines and February 15 - August 30 for raptors, impacts on nesting birds will be avoided by the establishment of appropriate buffers around active nests. The distance of the protective buffers surrounding each active nest site are: 500 feet for large raptors such as buteos, 250 feet for small raptors such as accipiters, and 250 feet for passerines. The size of the buffer may be adjusted by a District biologist in consultation with CDFW and USFWS depending on site specific conditions. Monitoring of the nest by a District biologist during and after treatment activities will be required if the activity has potential to adversely affect the nest. These areas can be subsequently treated after a District-approved biologist or designated biological monitor confirms that the young have fully fledged, are no longer being fed by the parents and have left the nest site. For IPM activities that clearly would not have adverse impacts to nesting birds (e.g. treatments in buildings and spot spraying with herbicides), no survey for nesting birds would be required.

District BMPs for IPMP

BMP ID#	Best Management Practices
23	San Francisco dusky-footed woodrat and Santa Cruz kangaroo rat – All District staff, volunteers, tenants, or contractors who will implement treatment actions shall receive training from a qualified biologist on the identification of dusky-footed woodrat, Santa Cruz kangaroo rat, and their nests. Generally, all San Francisco dusky-footed woodrat, Santa Cruz kangaroo rat, and their nests will be avoided and left undisturbed by proposed work activities. If a nest site will be affected, the District will consult with CDFW. Rodenticides, snap traps, and glue boards shall not be used in buildings within 100 feet of active San Francisco dusky-footed woodrat nests or Santa Cruz kangaroo rat nests; instead rodent control in these areas will be limited to non-lethal exclusion and relocation activities including relocation of nests if approved by CDFW. Tenants will contact the District for assistance in managing rat populations in buildings and under no circumstances will be allowed to use rodenticides.
24	Where appropriate, equipment modifications, mowing patterns, and buffer strips shall be incorporated into manual treatment methods to avoid disturbance of grassland wildlife.
25	Rare Plants – All selected treatment sites shall be surveyed prior to work to determine the potential presence of special-status plants. On a repeating basis, grassland treatment sites shall be surveyed once every five years and brushy and wooded sites shall be surveyed once every three years. Brush removal on rangelands will require biological surveys before work is conducted in any year. A 30-foot buffer shall be established from special-status plants. No application of herbicides shall be allowed within this buffer. Non-herbicide methods can be used within 30 feet of rare plants but they shall be designed to avoid damage to the rare plants (e.g., pulling).
26	Cultural Resources – District staff, volunteer crew leaders, and contractors implementing treatment activities shall receive training on the protection of sensitive archaeological, paleontological, or historic resources (e.g., projectile points, bowls, baskets, historic bottles, cans, trash deposits, or structures). In the event volunteers would be working in locations with potential cultural resources, staff shall provide instruction to protect and report any previously undiscovered cultural artifacts that might be uncovered during hand-digging activities. If archaeological or paleontological resources are encountered on a treatment site and the treatment method consists of physical disturbance of land surfaces (e.g., mowing, brushcutting, pulling, or digging), work shall avoid these areas or shall not commence until the significance of the find can be evaluated by a qualified archeologist. This measure is consistent with federal guidelines 36 CFR 800.13(a), which protects such resources in the event of unanticipated discovery.
27	Post-Treatment Monitoring – District staff shall monitor IPM activities within two months after herbicide treatment (except for routine minor maintenance activities which can be evaluated immediately after treatment) to determine if the target pest or weeds were effectively controlled with minimum effect to the environment and non-target organisms. Future treatment methods in the same season or future years shall be designed to respond to changes in site conditions.
28	Erosion Control and Revegetation - For sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment, erosion control measures shall be implemented after treatment. These measures could consist of the application of forest duff or mulches, straw bales, straw wattles, other erosion control material, seeding, or planting of appropriate native plant species to control erosion, restore natural areas, and prevent the spread or reestablishment of weeds. Prior to the start of the winter storm season, these sites shall be inspected to confirm that erosion control techniques are still effective.
29	<p>Operation of noise-generating equipment (e.g., chainsaws, wood chippers, brush-cutters, pick-up trucks) shall abide by the time-of-day restrictions established by the applicable local jurisdiction (i.e., City and/or County) if such noise activities would be audible to receptors (e.g., residential land uses, schools, hospitals, places of worship) located in the applicable local jurisdiction. If the local, applicable jurisdiction does not have a noise ordinance or policy restricting the time-of-day when noise-generating activity can occur, then the noise-generating activity shall be limited to two hours after sunrise and two hours before sunset, generally Monday through Friday. Additionally, if noise-generating activity would take place on a site that spans over multiple jurisdictions, then the most stringent noise restriction, as described in this BMP or in a local noise regulation, would apply.</p> <p>For IPM sites where the marbled murrelet has the potential to nest, as identified in the District's 2014 maps (see attachment) if noise-generating activities would occur during its breeding season (March 24 to September 15), the IPM activities would be subject to the noise requirements listed in the most current in the CDFW RMA issued to the District (see attachment).</p>
30	All motorized equipment shall be shut down when not in use. Idling of equipment and off-highway vehicles will be limited to 5 minutes.
31	Grazing Animals – Animals that have grazed in areas treated with Milestone herbicide will be moved to an untreated holding area for three days prior to being transferred to an area containing plant species of concern.