

**MARIN COUNTY INTEGRATED PEST MANAGEMENT  
PROGRAM COORDINATOR'S ANNUAL REPORT  
FOR 2015**

**Executive Summary**

This annual report provides the Marin County Board of Supervisors, the Integrated Pest Management (IPM) Commission (advisory to the Board), and the public with a summary and analysis of the County's Integrated Pest Management Program in 2015. This report meets all requirements of the IPM Ordinance (#3598) and Policy, includes a review of pesticide use records, and is accompanied by a proposed list of "Allowed Pesticide Products" for 2016.

The County IPM program applies to 147 sites including regional parks, landscaped right of ways and traffic medians, multiuse pathways, public buildings, boat ramps, remote radio antennae sites, pump stations, detention facilities, and other unique sites. In 2015, 126 sites were maintained without the use of pesticides.

Key components of the program include training, pest monitoring and identification, pest prevention, the use of alternative pest control activities focusing on mechanical, biological and cultural practices, a robust volunteer program, and the use of chemical control measures. Each site is evaluated on a regular basis and thresholds for pest problems are monitored. In the event that a pest exceeds an acceptable threshold, various management options are considered, with an emphasis given to non-chemical methods. The choice of treatment is determined based on severity, timing, and available resources. The IPM program also consists of monthly reporting, oversight of contracts and maintenance agreements involving pest management activities, website administration, reporting, and coordination with the Marin County's Agricultural Commissioner and the State Department of Pesticide Regulation.

The County's program continues to lead the way regionally as well as nationally, by aggressively focusing on non-chemical IPM alternatives and staying abreast of current trends and technology. This report summarizes achievements and non-chemical IPM management methods; details partnerships supporting the program; lists the violations and exemptions issued in 2015; analyzes chemical pesticide use (both conventional and organic); and discusses the allowed products list for 2016.

**Chris Chamberlain**  
IPM Coordinator

**Albert Hom**  
IPM Specialist

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**Notable 2015 Achievements**

- 126 of the 147 county sites were maintained without the use of pesticides. Sites maintained pesticide free included McNear's Beach Park, Stafford Lake Park, Paradise Beach Park, the Mill Valley-Sausalito Multi-Use Path, and many more.
- Time spent performing non-chemical alternative IPM methods by volunteers, staff, and county contractors increased by 22% year over year from 2014.
- 7,983 hours of volunteer time was spent weeding, picking up litter, spreading mulch, removing invasive species, and performing other non-chemical methods in support of the County's IPM program. An increase of 17%.
- Glyphosate usage decreased by 15% compared to 2014 continuing a downward trend over the past decade.
- All pesticide applications were made in compliance with DPR regulations.
- Rat/Mice trapping continued to help in minimizing rodent damage as there have been very few reports of sightings or damage, particularly at the Civic Center campus and McNear's Beach Park. This is notable given the fact that the county uses no rodenticides in its IPM program.
- Staff, Contractors and Volunteers spread over 500 yards of mulch and installed hundreds of square feet of cardboard sheet mulching material over the past year.
- Owl boxes at various park sites, including the Civic Center, continue to be maintained and productive in housing owls which aid in rodent control.
- Through the use of sticky traps, hand cleaning of foliage, selective leaf removal and plant replacement, release of predatory insects (Encarsia, Cryptolaemus, Orius, predatory mites and Delphastus) staff continues to successfully maintain the interior scape at the Civic Center without the use of chemicals.
- Cultural turf management practices, including fertilization, verti-cutting, topdressing, over-seeding and irrigation, have maintained acceptable weeds and disease in turf areas within the regional parks and county sites.
- Systematic and routine placement of yellow-jacket traps early in the spring season in an effort to increase trapping of queen yellow-jackets in an effort to offset the need for pesticide applications to yellow-jacket nests. The use of Waspfreeze, an insecticide used to treat yellow-jacket nests decreased by 56% year over year from 2014. This in part may be a result of the trapping efforts but also may have been impacted by the severe drought conditions.
- Parks staff has initiated a tarping experiment to evaluate an alternative control option for the invasive weed pest Lepedium at the White House Pool day use area in west Marin.

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**Partnerships supporting the County's IPM Program in 2015:**

**Invasive Spartina Project (ISP) at Hal Brown Park at Creekside**

In 2015, led by volunteer Sandy Guldman, the ISP, in collaboration with Marin County Parks, has continued its tireless effort to eradicate the invasive spartina plant from the marsh at Hal Brown Park. ISP, Marin County Parks and its community partners have teamed up to promote and host events with local schools and community partners ensuring an organized approach. Native planting efforts have been combined with the removal efforts to increase the success rate of eradication. GPS mapping continued this past year to monitor and track the plant infestation. This driving force behind this eradication continues to be restoring the native habitat of the marsh which is home to the endangered Ridgeway's rail and salt marsh harvest mouse.

**Linking Individuals to their Natural Community (LINC)**

County Parks staff, through the One Tam initiative, have partnered with LINC which is a youth stewardship program made up of 10-15 high school students learning conservation strategies working on our lands performing a variety of non-chemical IPM tasks while earning a stipend. This program has proven beneficial in multiple ways and looks to continue and grow in 2016.

**Save the Bay**

Save the Bay is a nonprofit organization that is dedicated to preserving the San Francisco Bay and its related estuarine habitat areas. County Parks staff and Save the Bay have worked diligently to suppress and control Harding Grass and other invasive exotic species threatening the Creekside marsh at Hal Brown Park. Efforts have focused on manual and mechanical removal and the installation of sheet, straw and arbor mulch.



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**College of Marin**

Students from the College of Marin partnered with County Parks staff and volunteers from Save the Bay to conduct a solarization experiment at Hal Brown Park at Creekside. The experiment involved the installation and monitoring of tarps on 3 different plots infested with Harding Grass. The students established, recorded, and monitored the plots to determine the efficacy of the solarization process in controlling Harding Grass which has infested and posed a significant threat to the native flora and fauna at the Creekside Marsh adjacent to Hal Brown Park. (photos below)



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**2015 Non-Chemical IPM Management & Practices**

<b>Month</b>	<b>Staff IPM Labor Hours</b>	<b>Volunteer Hours</b>	<b>Contractor Labor Hours</b>	<b>Total Hours</b>
<i>JANUARY</i>	1163	563	852	2,578
<i>FEBRUARY</i>	1196	434	646	2,276
<i>MARCH</i>	1470	517	513	2,500
<i>APRIL</i>	1519	1320	726	3,565
<i>MAY</i>	1225	554	750	2,529
<i>JUNE</i>	1997	319	710	3,026
<i>JULY</i>	2025	403	734	3,162
<i>AUGUST</i>	2112	571	720	3,403
<i>SEPTEMBER</i>	2089	1,199	759	4,047
<i>OCTOBER</i>	2238	906	761	3,905
<i>NOVEMBER</i>	1918	930	766	3,614
<i>DECEMBER</i>	1766	267	750	2,783
<b>Total:</b>	<b>20,718</b>	<b>7,983</b>	<b>8,687</b>	<b>37,388</b>

<b>Year</b>	<b>Staff IPM Labor Hours</b>	<b>Volunteer Hours</b>	<b>Contractor Labor Hours</b>	<b>Total</b>	<b>% change</b>
2013	13,905	7,654	7,949	29,506	---
2014	15,774	6,678	8,201	30,653	3.7
2015	20,718	7,983	8,687	37,388	18

The above tables are indicative of the County's continued commitment to Integrated Pest Management with an emphasis on alternative, least toxic methods of pest management. These practices include mechanical and manual weed removal, modifications to sites, such as irrigation system improvements, sheet mulching, mowing, trapping, turf aeration, plant and tree removal, etc., each combining to help control various pest populations. The total cumulative hours equate to over 19 full time employee equivalents of labor dedicated to performing non-chemical alternative IPM methods over the course of 2015 through the County sites which is an increase of 18%.

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## **2015 Challenges – IPM Violations and Exemptions**

### **Violations:**

1. On June 16, 2015 Bartlett Tree Experts made an application of Reliant, a fungicide used to prevent Sudden Oak Death, to high value Oak trees growing in the non-pedestrian traffic medians of County Service Area 16 (CSA-16). The product Reliant was not on the 2015 Allowed Products list and should not have been applied. The product Reliant is an alternative label which is comparable to Agrifos, which is on the allowed list and should have been applied. A notice of violation was sent to Bartlett Tree Experts and they made the appropriate adjustment for their fall preventative treatment of the high value oak trees within CSA-16.
2. On October 26, 2015, The Shooter Co., a landscape maintenance contractor responsible for maintaining the grounds of the Los Gamos complex, made an unauthorized application of Spectracide to the no-mow fescue fronting at 1600 Los Gamos. There was no noticing of the application, the application was made to ornamental turf and the product Spectracide was not on the 2015 Allowed Products list, all violations of the County's IPM ordinance. The Contractor was confused with the applicability of the ordinance as a portion of the property is County owned (1600 Los Gamos) and a portion is privately owned (1650 Los Gamos) and they failed to differentiate the two. A notice was sent to the contractor and there have been no further violations with this contractor.

### **Exemptions:**

1. 1/26/15 an exemption was issued for an Aquamaster treatment to be made within the Rush Creek Landscape and Lighting Maintenance District. The treatment was made to weeds growing within the landscaping along the frontage of Atherton Ave. The proximity of the landscape being immediately adjacent to the high speed traffic traveling on Atherton Ave. poses a direct threat to employee safety.
2. 2/4/15 an exemption was issued for a cut stump treatment of 9 Eucalyptus stumps as part of a fire fuel management project in partnership with the Golden Gate National Recreation Area and the Tamalpais Valley Community Service District. The stumps were located below Vista de Valle.
3. 2/4/15 an exemption was issued for a single application of Aquamaster to treat invasive scotch and French broom. The treatment was part of a habitat restoration project within County Service Area 14 made to re-sprouting broom plants following mechanical removal. The project was



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conducted in alignment with the Homestead Valley Land Management Plan and under the direction of the Homestead Valley Land Trust and County Parks staff.

4. 2/10/15 an exemption was issued to the McInnis Golf Course maintenance personnel authorizing treatment to designated turf areas on the golf course. The designated turf areas were specified as the tee boxes and the putting greens (appx. 1 acre). The exemption did not focus on a specific product but the noticing requirement and the ability to treat turf, which typically is not treated. The growing conditions in a golf course environment are extremely challenging and unnatural making the turf highly susceptible to a variety of diseases and fungi. This exemption allows the maintenance staff to respond swiftly and effectively to minimize the spread and infestation of these pests. This exemption covered the duration of 2015.
5. 2/10/15 an exemption was issued allowing County staff to immediately make applications of wasp freeze upon discovery of nests that pose an immediate threat to the public and/or staff. This exemption eliminates the four day noticing requirement. This exemption extended through the duration of 2015.
6. 2/23/15 an exemption was issued authorizing a single application of Aquamaster to be made to weeds growing in non-pedestrian traffic medians and within the landscape fronting Sir Francis Drake Blvd. within County Service Area 16.
7. 2/23/15 an exemption was issued for a single application of Aquamaster to be made to the weeds surfacing within the non-pedestrian traffic medians along Sir Francis Drake Blvd. and Bon Air Road
8. 9/2/15 an exemption was issued for an application of Aquamaster to be applied to the center medians along Sir Francis Drake Blvd. The contractor made an application to a limited segment of the medians along SFD.
9. 10/30/15 an exemption was issued for an application of Cimi Shield, a soy bean based contact pesticide that was needed to treat a bed bug infestation at the Health and Wellness Center. The reason for the exemption was due to the fact that the product was not on the allowed products list. The application used 4 ozs. of Cimi-Shield and was made by ATCO Pest Control, the County's Structural Pest Control contractor.
10. 12/7/15 An exemption was issued for an application of Aquamaster herbicide to be made to the center medians along Sir Francis Drake Blvd. from S. Eliseo to College Ave. as well as the center median along Bon Air Road from Sir Francis Drake Blvd. to the frontage of Creekside Park. The

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exemption was due to the fact that the product falls under the exemption category of the Allowed Products list. The application was needed due to the emergence of cool season broadleaf weeds and grasses germinating in the center medians. The treatment was made while the weeds were young and required the least amount of material in an effort to prevent traffic hazards as well as minimize the time in which workers must spend working in the medians surrounded by high speed traffic which poses a significant risk.

## Chemical Usage

### IPM: 3 yr Comparison of Usage 2013 to 2015

#### Organic Products Used (in ounces)

	2013	2014	2015
Companion	320 ozs	960 ozs	0
Liberate	158 ozs	170 ozs	225 ozs
Neem oil	355 ozs	35 ozs	0
Essentria IC3	582 ozs	2554 ozs	616 ozs
Eco Exempt G	0	60 lbs	143 lbs
EVAC	0	0	68 ozs
Avenger	0	0	320 ozs
Finalsan	0	13.5 ozs (violation)	576 ozs
Cimi-Shield	0	0	4 ozs (exemption)
Competitor	0	3 ozs	8 ozs

#### Landscape Maintenance Products

- Avenger an organic burn down herbicide used to control weeds. This was added to the list in 2015 and used as an alternative to glyphosate based products. The efficacy was determined to be extremely limited and the volume product needed was significant per application. Preference was given to finalsan.
- Companion is a biological fungicide that has been used at the McInnis Golf Course on the courses tee's and greens. This product is being used with some regularity which has significantly improved the overall health of the turf and subsequently reduced the amount of synthetic material applied. Companion is said to affect turf in a similar fashion that Vitamin C affects humans. There was no usage in 2015 as the contractor has implemented a compost tea program in an attempt to further reduce dependency on chemical pesticides.



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- Competitor is an herbicide adjuvant that is an organic material usually mixed with systemic herbicides to improve the efficacy of the treatment.
- Finalsan is a burn down herbicide used as an alternative to glyphosate products. It was applied to the weeds growing in the hardscape and landscape planters at the Health and Wellness Center. This product has proven to be more effective than Avenger however efficacy is significantly reduced when ambient temperatures are cooler and weeds are larger than 2-4”.
- Liberate is an herbicide adjuvant that is an organic, soybean based material usually mixed with systemic herbicides to improve the efficacy of the treatment.
- Neem Oil is horticultural oil that is used to reduce scale and other pests on ornamental trees. Scale outbreaks were more prevalent in 2013 hence the variance in quantity used. There was no usage in 2014 or 2015.

**Structural Pest Control Products**

- Eco Exempt G was used to treat crawling insects at the following County facilities: County Garage, 10-20 North San Pedro, Juvenile Services Center, Civic Center, 120 N. Redwood complex.
- Essentria IC3 is used to treat crawling and flying insects at several county facilities. Active ingredients include essential plant oils from rosemary and peppermint.
- EVAC is an organic, pine scented product that is used in the engine compartments of county fleet vehicles to deter rodents from entering the engine compartment and chewing on wiring harnesses and other engine components.
- Cimi-Shield is an organic contact pesticide used to control a bed bug infestation. This product was not on the 2015 Allowed list however an exemption was issued and the product was applied. Total control after a single application was gained; public access was controlled during and following the treatment and staff has requested this product be added to the allowed products list for 2016.

**Conventional Products Used- (in ounces)**

	<b>2013</b>	<b>2014</b>	<b>2015</b>
Agrifos	320	2048	2656
Aquamaster (glyphosate)	1081	741	634
Banner Maxx II	256	128	93
Fusilade II	0	22	0
Habitat	14	34	24
Wasp Freeze	87.5	123	54
Terro PCO	29	58	44
Max Force Ant Killer Bait Gel	0	1	1
Max Force Roach Bait Station	0	0	1
Pentra-Bark	0	72	104
Reliant	0	0	1056

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Landscape Maintenance Products

- Agrifos is a fungicide used as a preventative treatment for high value oak trees to reduce their susceptibility to Sudden Oak Death. 2015 treatments focused on the Oak trees throughout the Greenbrae, CSA-16 non-pedestrian medians.
- Aquamaster was used for the spot-spray treatment of weeds in non-pedestrian medians and landscape frontages along high speed traffic roadways and a single application was made in CSA-14 Homestead Valley as part of a habitat restoration project in compliance with the Land Management Plan for the Homestead Valley.
- Banner Maxx II was used to treat a pink snow mold outbreak at the McInnis Golf Center. Usage totals continued their downward trend as a result of aggressive IPM efforts by course staff including a new compost tea program for the tees and greens at the course.
- Fusilade II is a selective herbicide that was used to control *Bermuda Grass* that had exceeded the allowable threshold at 3 county sites in 2014. There was no use in 2015 as alternative methods were used to keep infestations below threshold levels. The infestations continue to pose problems for staff and contractors as mechanical control is virtually impossible.
- Habitat this product was used at Hal Brown Park as part of the Invasive *Spartina* removal project as well as single treatments at McInnis Park and McNear's Beach to control the invasive *Pepperweed*.
- Pentra-Bark is a surfactant that was used in conjunction with Agrifos as a preventative treatment to the high value oak trees in the Greenbrae (CSA-16) area.
- Reliant is a generic version of agrifos, which is a fungicide, used to control/prevent sudden oak death.
- Wasp Freeze applications were made to as few nests as possible, and only when the yellow-jacket nest posed a risk to the public or to staff.

Structural Pest Control Products

- Terro PCO was used to aid in controlling ants and other crawling insects. This product was used in protected bait stations.
- Max Force Ant Killer Bait Gel was applied to aid in controlling ants at the Health and Wellness center and other County facilities. Product was applied through a controlled bait station.

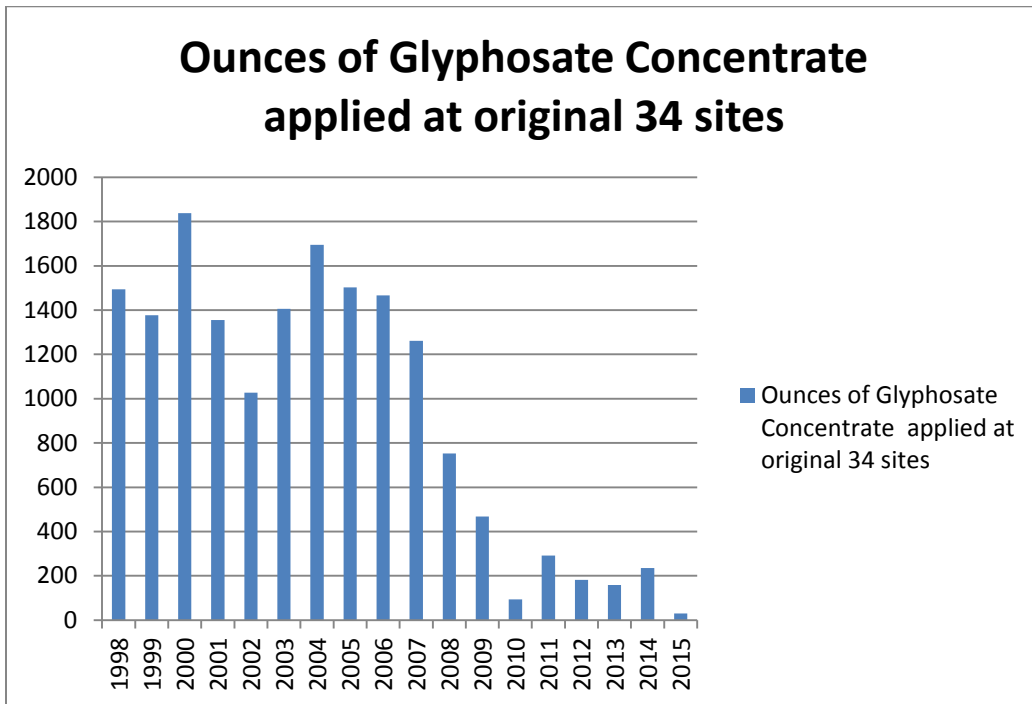
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## Glyphosate

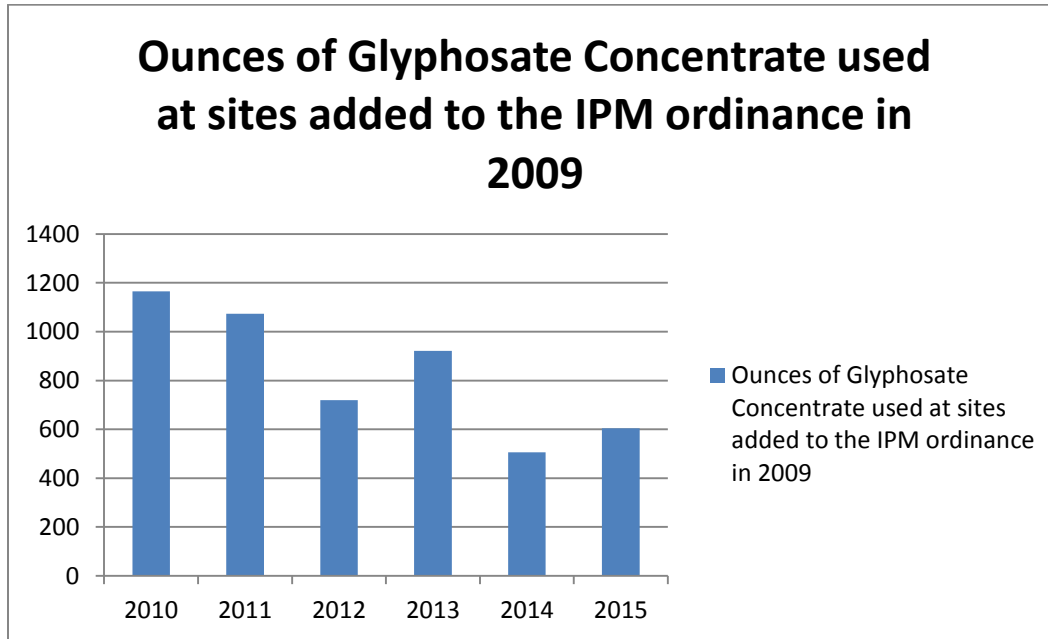
Over the course of 2015 there was much discussion around Glyphosate, the active ingredient in many systemic herbicides used to control weeds and other pests.

In March of 2015 the International Agency for Research on Cancer (I.A.R.C.), which is a subset of the World Health Organization, reclassified glyphosate, the active ingredient in several systemic herbicides including those used as part of the County's IPM program, as a probable carcinogen. County staff, in conjunction with the Board of Supervisors and the IPM Commission, began looking at current practices and uses of these products. During this evaluation period, staff also participated in a Bay Area wide discussion with other partner agencies grappling with the same issues in an effort to better understand and consider appropriate actions to take. Glyphosate use throughout Marin County, as reported by the California Department of Pesticide Regulation (DPR), revealed that Marin County sites under the IPM ordinance received less than one half of one percent (0.11%) of the total amount of glyphosate applied in Marin during the 2014 year. This figure was clearly indicative of a broader issue but the County of Marin wanted to further evaluate and explore options to decrease its use of Glyphosate.

The following two graphs show historical usage of Glyphosate based products applied under the County IPM program. The first represents the initial 34 sites that were applicable to the 1998 IPM Ordinance. The Second graph shows the usage at the sites added to the ordinance when it was revised in 2009.



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On October 6, 2015 the County Board of Supervisors hosted a public workshop to discuss the County's glyphosate use as a component of its Integrated Pest Management Program. At that time, staff proposed, with subsequent support from the Board of Supervisors, to reserve the use of glyphosate for critical uses only. These critical uses included sites that posed a significant risk to public safety (wild fire, traffic/pedestrian safety, worker safety), protected critical habitat, and instances where invasive/exotic species pose a threat to local agriculture. This proposal also included eliminating glyphosate use within the County's regional park facilities. The following sites are now being maintained without the use of glyphosate:

Adrian-Rosal Park	Agate Beach	Alto Multi Use Path
Bayside Park	Blackpoint Boat Launch	Bolinas Park
Bolinas Multi Use Path	Candy's Park	Castro Park
Corte Madera Creek Multi Use Path	Corte Madera RR path	Creekside Park
Forest Knolls Park	Lagoon Park	Lucas Valley Park
McInnis Park	McNear's Beach Park	Mill Valley/Saus MUP
Miller Park	Mission Pass MUP	Paradise Beach Park
Pueblo Park	Rush Creek Park	Stafford Lake Park
Upton Beach (Stinson)	Village Green Park (Stinson)	

2015 use records indicate that there were glyphosate applications made at 10 sites which primarily focused on non-pedestrian traffic medians or landscape frontages adjacent to roadways. This is consistent with the defined critical uses supported by the County Board Supervisors on October 6, 2015. The lone exception being an application made to invasive species re-sprouting following mechanical removal as part of a habitat

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restoration project in Homestead Valley. This project followed IPM principles and was consistent with the Land Management Plan prepared for the Homestead Valley Land Trust. Total usage of glyphosate concentrate in 2015 was 634 ozs compared to 741 ozs in 2014. This is a reduction of 15% year over year and supports the continual downward trend in usage.

**The 2016 Allowed Pesticide Products List**

The pesticide list approved by the Board of Supervisors for 2015 has allowed staff and its contractors to respond to most pest problems in a timely and effective manner. For the 2016 Proposed Landscape Allowed Pesticide List, we propose to add two new products: *Reliant* and *Suppress*. *Reliant* is an alternative to *Agrifos* which has the same active ingredient used as a preventative treatment for Sudden Oak Death. This product is less expensive than *Agrifos*. *Suppress* is an organic knock-down herbicide derived from fatty acids which acts similar to *Finalsan* but it is more readily available and less expensive. We propose to eliminate seven products from the 2015 Landscape Products List: *Fiesta*, *Neem Oil*, *ProStar*, *Imicide*, *Merit*, *Gallery*, and *Astro*. These products are being eliminated because there are newer, less toxic alternative products available; some products are suspected to be harmful to honeybees; and some that simply have not been used for a long time. There is also an addition to the Structural Products List, *Cimi-Shield*, which is an organic contact herbicide used to control bedbugs. This product was used once by exemption in 2015 and proved to be very effective and less toxic than other alternatives on the list.

**IPM Trainings in 2015**

IPM relies heavily on knowledgeable persons trained in the science and practice of integrated pest management. Parks and landscape staff members involved with IPM participate in an annual training program, "Safe Handling and Use of Pesticides". All employees who work with these chemicals are required to take an annual four hour class. The class covers the use of OMRI and commercial pesticide applications, proper use of equipment, personal protective gear, organic alternatives to commercial chemicals, "best management practices" to reduce the need for applications, mapping sites, monitoring, reading pesticide recommendations, reading a chemical label, etc. Other training topics range from calibration of equipment, laws and regulations, insect and weed identification, turf management, plant diseases, proper sheet mulching, and best management practices. Each training covers IPM methodology and practices in addition to commercially recognized methods of pest reduction.

Staff also attend a variety of trainings throughout the course of the year that focus on emerging IPM products, laws and regulations, and best management practices. Topics included Sudden Oak Death management and preventative treatment, plant health care,

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use and impacts of organic mulch, use of Owls as a component of an IPM program, rodent control methods, soil composition and analysis, etc.

Staff routinely participated in meetings with other bay area IPM personnel to discuss current issues, alternative IPM methods, new products, best management practices and relevant science behind IPM. Staff participated in the City/County of San Francisco Technical IPM Advisory Committee and attended the California Weed Science Academy to stay abreast of developments in the IPM world.

**Conclusion**

2015 was a busy year for the County's IPM program. Efforts surrounding non-chemical IPM methods totaled over 37,000 labor hours, an increase of over 18% or the equivalent of over 19 Full Time Employees. A concerted effort to reduce the use of chemicals was a top priority of the program, which resulted in a variety of partnerships, experiments, and good old fashioned elbow grease. A commitment to discontinue the use of glyphosate within the regional park facilities and reserve its use solely for defined critical uses was also made during the course of 2015. There continue to be significant challenges that face the County's IPM program including protecting the county's employees, capital investments, the integrity of its parks and public spaces, and others as we head into 2016. Staff and the IPM commission remain committed to carrying forward the great work achieved in 2015.

Requests for accommodations may be made by calling (415) 473-4381, TTY (415) 473-2495, CRS dial 711, e-mail at [disabilityaccess@marincounty.org](mailto:disabilityaccess@marincounty.org) at least five work days in advance. Copies of documents are available in alternative formats, upon request.