

Thurston County's 2010 Integrated Pest Management Report

History:

The Board of County Commissioners adopted the Thurston County Pesticide Use Policy in 1989 and the revised Pest and Vegetation Management Policy in 1993. The Board adopted these policies after significant public involvement and input from the Pesticide Use Study Committee. These policies established a mandate for all county departments using pesticides to adopt Integrated Pest Management (IPM) programs and prescriptions. Additionally, it created the Pest and Vegetation Management Advisory Committee (PVMAC). During this time, the county placed a moratorium on the use of pesticides until the IPM policies and programs were approved by the County Commissioners. The Pest and Vegetation Management Policy applies to only county departments and use of pesticides on County property or land managed by the County.

In 1990, the Thurston County Board of County Commissioners appointed nine citizens to the PVMAC. The Committee has been directed to assist in the implementation of the Pest and Vegetation Management Policy. This Policy emphasizes development and implementation of IPM programs that provide effective pest and vegetation management with minimal environmental and public health impacts. Often, an indirect result of IPM is a reduction in pesticide use.

2010 IPM Program

In 2010, there was an overall increase in the use of pesticides by Thurston County due to the combined efforts of continued aquatic weed control in Long Lake and Lake Lawrence and tall oat grass control at the 1,100 acre prairie in Glacial Heritage Preserve. There was also a slight increase (less than 2 gallons) in pesticide use for noxious weed control. The Waste and Recovery Center (WARC) and the Noxious Weed control program managed their vegetation problems mostly with manual control efforts and the WARC used less than one-gallon of pesticide in 2010.

Public Works Department - Parks Maintenance Program:

The Public Works Department Transportation Division is responsible for the maintenance of all county rights-of-way. The vegetation control program is conducted almost entirely by mechanical means, primarily mowing. The Public Works' Parks Maintenance Program provides building and grounds maintenance in a variety of locations. Outlined below are general descriptions of the type of areas maintained, the duties performed and a list of the specific sites:

1. COUNTY PARKS: Building and grounds maintenance of lawn areas, picnic shelters, trails, parking areas, restrooms, caretaker residences, park grounds, etc. The sites include: Burfoot Park, Kenneydell Park and Frye Cove Park.
2. ATHLETIC FACILITIES: Building and grounds maintenance of sports fields, picnic areas, trails, parking areas, restrooms, park grounds, etc. The majority of the work involves turf care. The sites include: Kenneydell Park Ball Fields and the Griffin Athletic Fields.
3. COUNTY TRAIL SYSTEM: Building maintenance of trailhead restrooms and kiosks and grounds maintenance of over 40 miles of trail. The majority of the work involves mowing and trimming vegetation along trails as well as control of noxious weeds. The Chehalis Western Trail and the Yelm-Tenino trail are paved and make up 35 miles of the system with the 12.5 mile Gate-Belmore trail held for future development.

4. COUNTY OWNED BUILDINGS AND FACILITIES: Landscape maintenance including; turf care, weeding, pruning, etc. of the following sites: County Courthouse, Emergency Operations Center, Coroner's Office, Youth Service Center, Twin County Credit Union Building, Ferguson Building, County Health Building, and the Evaluation and Treatment Center.

5. PRESERVES AND HISTORICAL SITES: The sites include: Fort Eaton, Mima Cemetery, George Washington Bush Memorial, Glacial Heritage Preserve, Woodland Creek Wetlands, and the Johnson Point Wetlands. These sites require grounds maintenance of lawns, formal and native beds, control of non-native species, habitat protection, etc.

6. STORMWATER PONDS: The Parks Department controls invasive plants such as blackberry in county owned stormwater ponds. The treatments are necessary so the ponds can perform their necessary function.

Public Works Department – Waste and Recovery Center (WARC)

The WARC is Thurston County's closed landfill that operates as a transfer station for solid waste and other waste recycling programs. Although the waste that is brought into the facility is shipped out of County for disposal, there are still areas where waste is separated and containerized. These areas of waste handling are an ongoing source for rodent pressure. The former landfill area is gradually being utilized for other community uses that are altering the pest and vegetation goals. Areas that used to be managed with a high tolerance of weeds have been converted to a dog park, a park and ride, and a high end demonstration garden for the master gardeners program. Vegetation selection and placement will be key components to the success of managing these areas with minimal pesticide usage.

Resource Stewardship - Noxious Weeds Program:

Herbicides are used only for noxious weed and other nuisance vegetation control within the county rights-of-way. The county's Noxious Weeds Department oversees the control of listed noxious weeds in Thurston County.

Resource Stewardship - Water Resources Program:

The Resource Stewardship's Water Resources Division manages the Long Lake and Lake Lawrence Management Districts and the county's Stormwater and Surface Water Utility. The Lakes Program implements Commissioner approved IPM prescriptions to control the noxious white fragrant waterlily and nuisance aquatic plants using county approved herbicides. The Stormwater and Surface Water Utility uses the County's Parks Maintenance Program staff to control vegetation on county owned stormwater facilities when they impede the performance of the structure.

Central Services Department

The Central Services Department is responsible for the maintenance of all county buildings and facilities. The primary focus of their control program is on insects such as carpenter and moisture ants, rats, and yellow jackets.

Description of pesticide use:

The county's only use of pesticides between 1990 and 1996 was the use of fluridone on Long Lake to control Eurasian Watermilfoil using an approved IPM Prescription. However, due to the infancy of the program the amount of herbicide used wasn't made a county record. Beginning in 1996 when the first IPM programs were approved the county began to track the amount of pesticides being applied

annually. Figure 1 below, shows the total amount of pesticides used by the County over the past fourteen years. The “Pounds of active ingredient” in all the figures is based the percentage of active ingredient (or EPA’s determination of acid equivalents) within the pesticide product used (which includes other ingredients like water, clay, surfactant, etc.) The graph clearly shows variability in the amount of pesticides applied annually.

The reasons for the differences in the amount of pesticides used from year to year vary. Some years it is due to new sites being added to the county’s inventory of areas to maintain and sometimes a program needs to focus on controlling a problem pest. Examples of problem sites include the Thurston County Waste and Recovery Center, Glacial Heritage Nature Preserve, Thurston County Emergency Management Center, the employee leased parking lot-J, trails, the Juvenile Detention Center, the Roads Maintenance Facility, and the control of nuisance aquatic weeds in Long and Lawrence Lakes. Pest and weed control at these sites is necessary due to a variety of site-specific goals identified in each of their approved IPM Programs and Prescriptions.

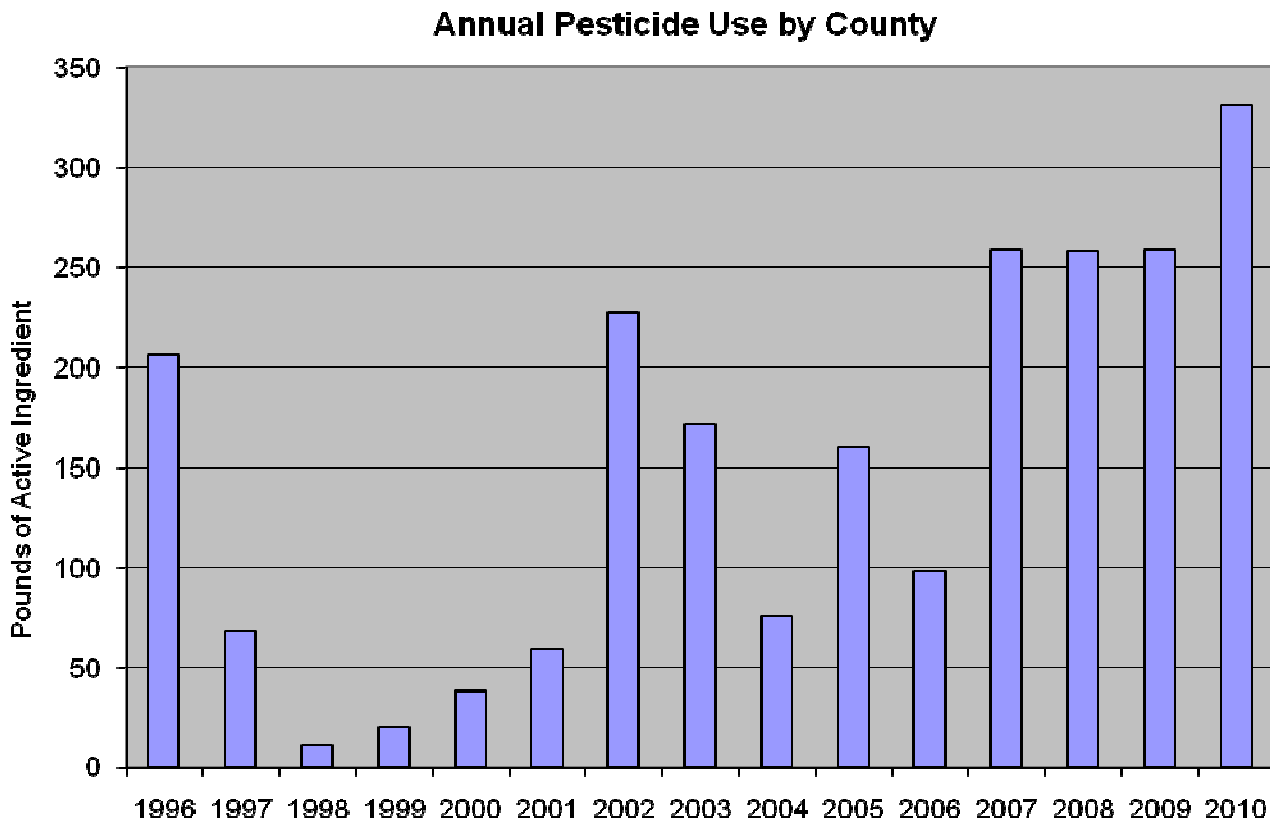


Figure 1 – Total amount of pesticides used by Thurston County

Figure 2 breaks down the amount of total “pounds of active ingredient” of pesticides used by County departments at the County’s Waste and Recovery Center, the Glacial Heritage Park, at and around County buildings and parks, for control of noxious weed control, and the control of nuisance aquatic plants and noxious fragrant water lilies in Lake Lawrence and Long Lake. Each of these sites and control programs are explained below and more detail can found in the tables at the end of the report.

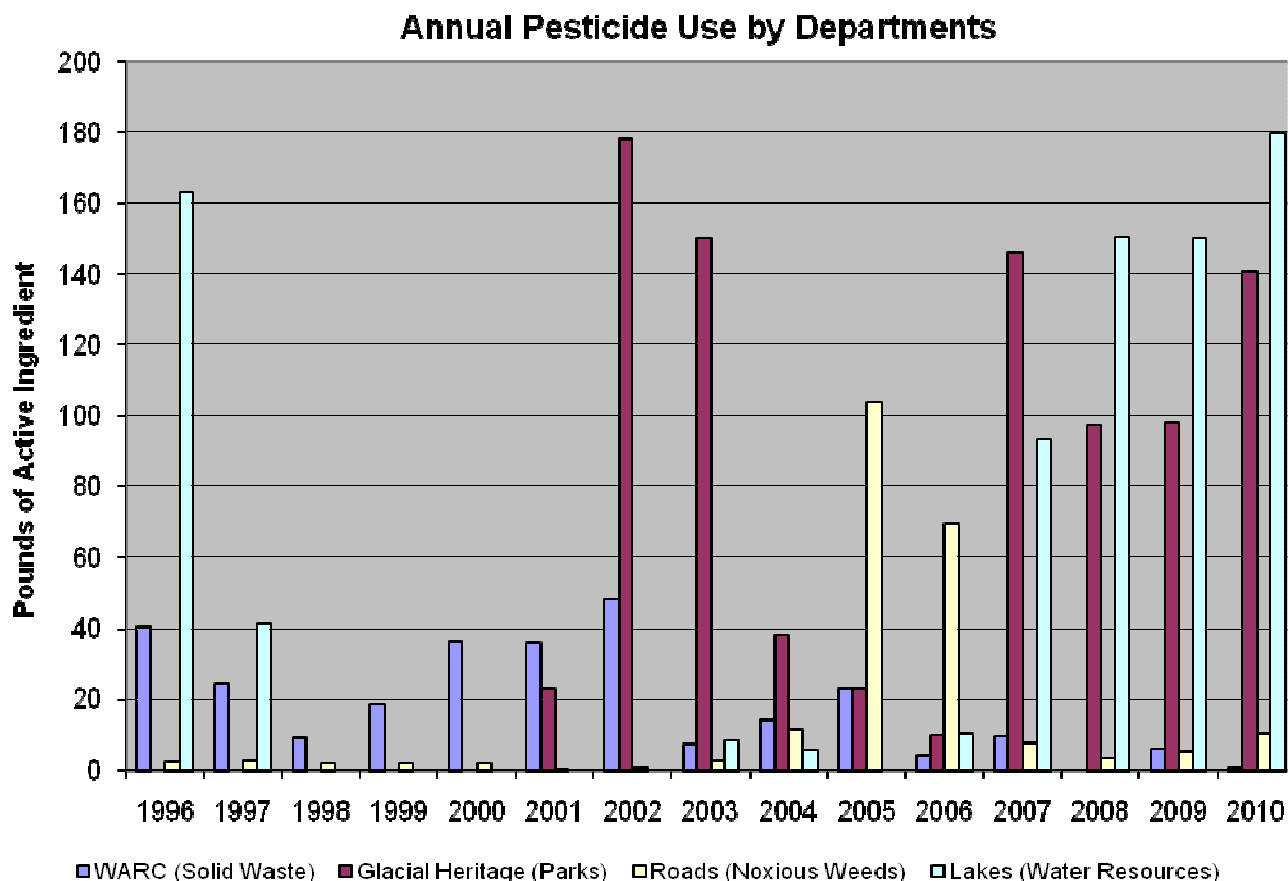


Figure 2 – Compares the amount of pesticides used by Thurston County Departments.

Waste and Recovery Center (WARC)

The landscape at the WARC, which is the County’s sanitary landfill, is a very challenging site to manage for weeds. The landscape is about eleven acres of various species of hardy ornamental shrubs. Planted in 1991; it included an irrigation system and two feet of topsoil on top of an impervious synthetic membrane. Initial weed control included hand-weeding and adding bark mulch to the open ground between the shrubs. The irrigation system was designed to last about five years and was thought to not be needed once the plants were established. The IPM Plan projected that the canopy of the shrubs would fill in and shade out competing vegetation thereby requiring only hand weeding and mulch for maintenance of the site.

Many of the shrubs have died due to the thin layer of topsoil, the heat generated by the underlying landfill material, problems with the irrigation system, damage to the shrubs from rabbits, and construction of a gas line. The shrubs continue to be replaced with varieties that survive harsh conditions. While mulch is continuously being added, the result is the canopy cover is not helping reduce the weed growth as planned hence the continued use of herbicides.

In 2010, there were several large construction projects (park and ride lot, dog park, hazo house) started at the WARC that involved over 25% of the overall land. The park and ride replaces several acres of vegetation that had a high tolerance for weeds and will incorporate smaller plantings with lower weed tolerance. The dog park will also have a low weed tolerance although it has been designated as a “no pesticide” area and will be controlled with manual efforts. The rest of the WARC with low weed tolerance is primarily controlled manually with the use of corrections work programs. Figure 3 shows the pounds of herbicides used on this site from 1996 to 2010.

Annual Pesticide Use at the Waste and Recovery Center (WARC)

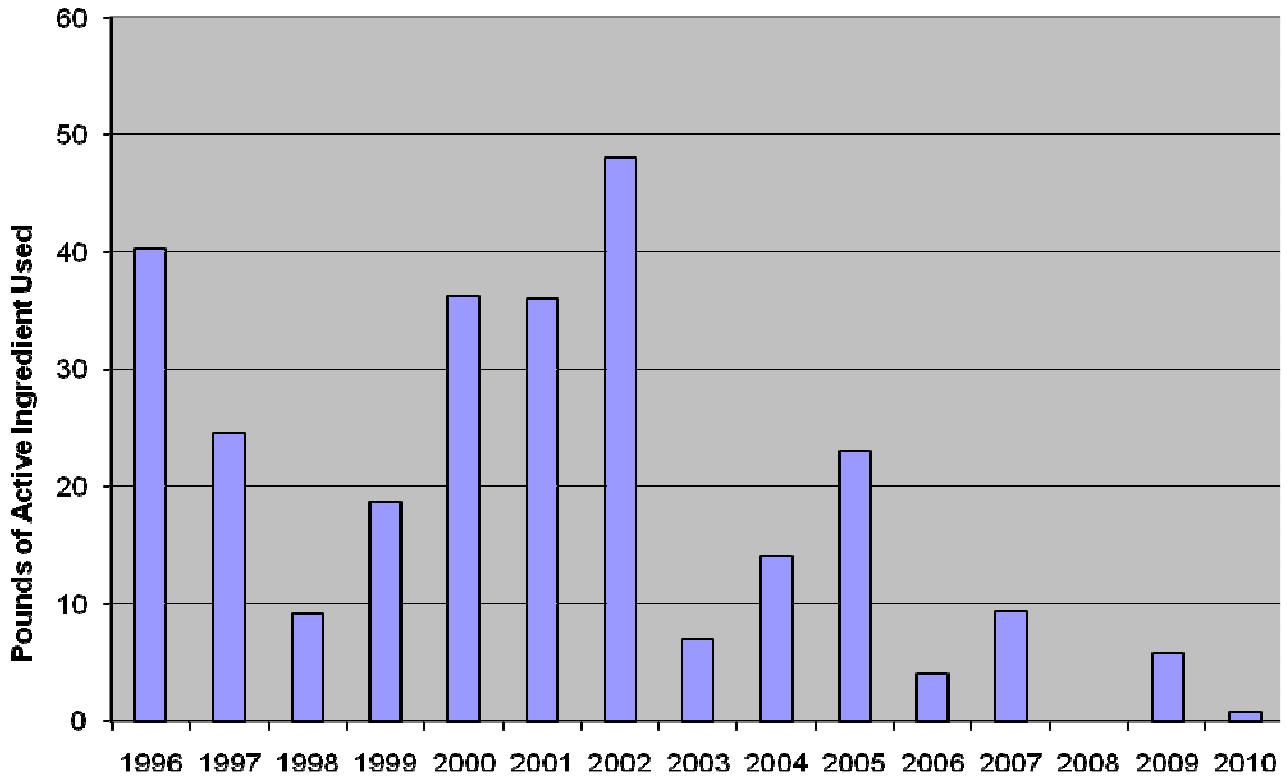


Figure 3 – Total herbicide use at the Waste and Recovery Center

Glacial Heritage Nature Preserve

The Glacial Heritage Nature Preserve is a 1,020-acre site located in southwestern Thurston County that was historically dominated by prairie vegetation. The County owns the land, surrounding an 80 acre in-holding owned by The Washington Department of Fish and Wildlife, but the Nature Conservancy manages the entire property. The management goal of the Preserve is to restore it to native prairie with all associated species. In the 1980's, when the County obtained the land, the site was wholly inundated with Scotch broom and was beginning to experience an invasion of non-native grasses (Figures 4a and 4b). The first step in prairie restoration efforts was to rid the site of Scotch broom. The Nature Conservancy developed an integrated program to control Scotch broom that began utilizing mowing or mechanical removal, followed by fire and chemical control, and finally hand pulling. By the end of 2003, most of the original stand of Scotch broom had been removed. Since Scotch broom seeds persist for up to 50 years in the soil, they continue to germinate and require control. Currently, 90% of Scotch broom infestations on the preserve are controlled by prescribed fire, hand pulling and spot spraying of herbicides. The remaining 10% requires the use of herbicides. In 2010, 45 acres of Scotch broom infestation was managed with hand pulling and tractor mowing. Prescribed burning of 70 acres took place to help control Scotch broom by inducing seed germination and to further assist in the control non-native grasses.

Following the removal of the Scotch broom, the Nature Conservancy increased the planting of desirable forbs and bunch grasses, however, non-native grasses also began filling in open spaces. As a potential reintroduction site for rare butterfly species including the Taylor's checkerspot and Mardon skipper, these invasive grasses change the structure of the prairie and reduce the amount of native forbs and grasses required for life cycle completion. In 2007, an approved Non-Native Grass IPM Prescription was implemented. The increase in herbicide use in 2007 was due to the addition of

the control of various species of Eurasian grasses. Figure 4 below, shows the pounds of herbicide used at the Glacial Heritage Nature Preserve from 1996 to 2010, over the entire site including the 80 acre in-holding.

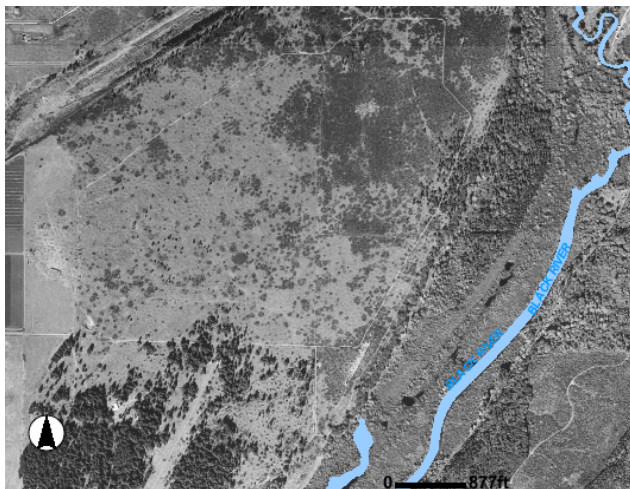


Figure 4a - Glacial heritage aerial in 1996. Dark patches are broom infestations.



Figure 4b - Glacial heritage aerial in 2009

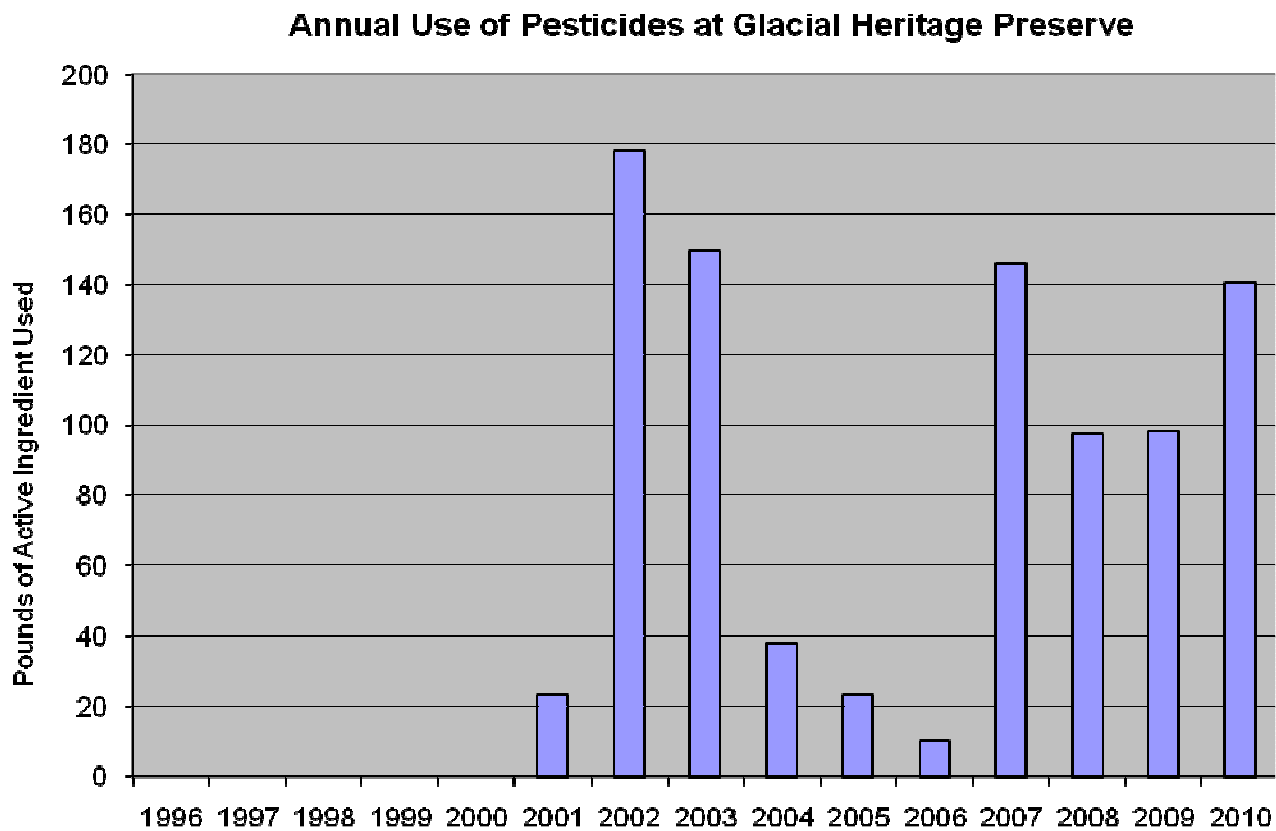


Figure 4 – Total herbicide use at the Glacial Heritage Nature Preserve

Water Resources Division (Lakes)

The Water Resources Division manages the Lawrence and Long Lake Management Districts. In the early 1990's Long Lake had a treatment to eradicate Eurasian Watermilfoil a noxious, invasive, and non-native aquatic plant. Liquid SONAR-AS (active ingredient fluridone) was selected as the herbicide, due to its very low toxicity to animals and aquatic organisms.

In 1996, the Commissioners approved an IPM Prescription for the control of the noxious fragrant waterlily. That same year about 80 acres of fragrant waterlilies were treated in Lake Lawrence with Glyphosate; since then spot treatments have been conducted intermittently to keep them under control. In 2006, Long Lake's waterlily population covered approximately 42 acres, when Glyphosate treatments began. Fewer than 4 acres remain to be treated; native yellow spatterdock lilies are re-colonizing the treated areas.

In 2007, the Commissioners approved an IPM prescription for the control of nuisance native aquatic plants in Long Lake and Lake Lawrence. The prescription allows for treatment up to 45 acres annually in each lake. The herbicides SONAR-PR and SONAR-Q (pellets containing the active ingredient fluridone) are now being used in the lakes. The pellets are 95% clay, which slowly releases the fluridone and prolongs the exposure time at extremely low concentrations, between 1-10 parts per billion.

In 2010, there was no need to treat fragrant water lilies in either lake. Sonar Q was used to treat a combined 88.6 acres in Long Lake and Lake Lawrence.

Annual Pesticide Use by Water Resources (Lakes)

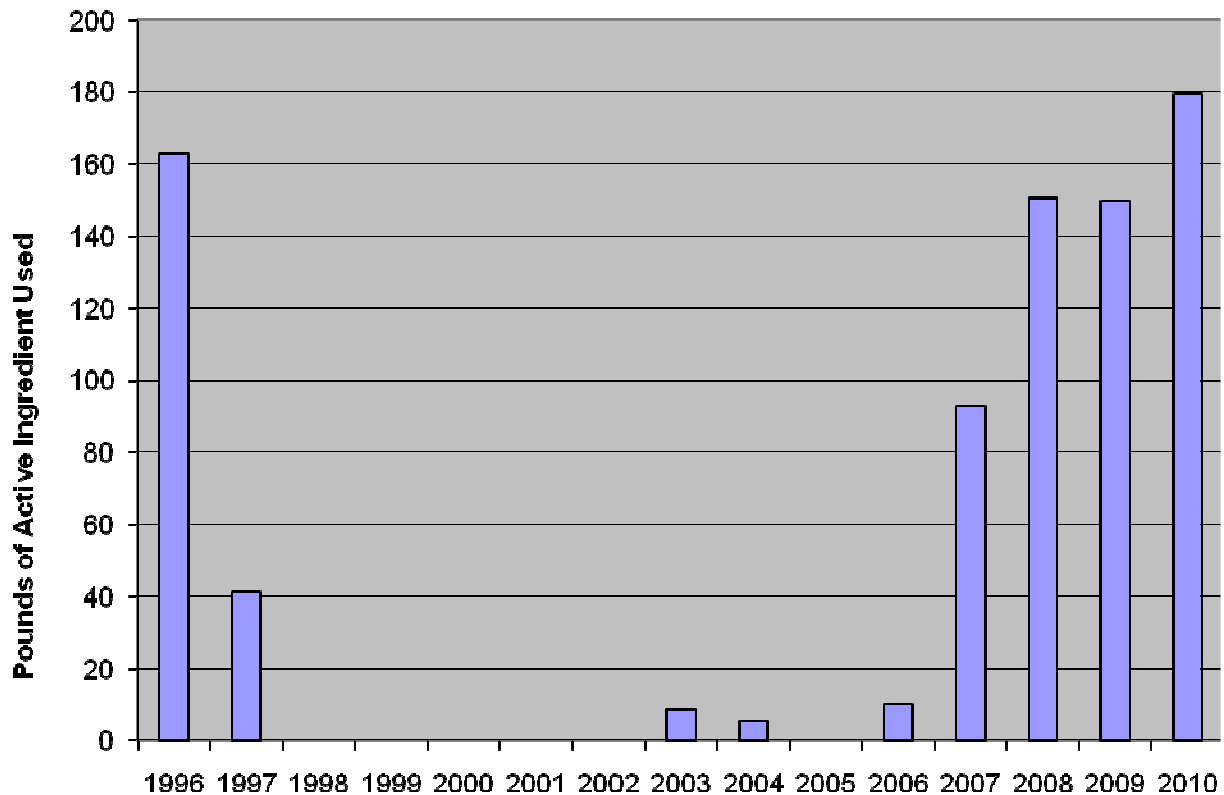


Figure 5 – Total herbicides used by the Lake Program

Noxious Weeds Program

The Noxious Weed Program is charged with the control of listed noxious weeds throughout Thurston County. Herbicides are applied to control noxious weeds when manual control is not effective. Figure 5 shows the pounds of herbicides used to control noxious weeds by the County.

During 2004, experiments began testing several application techniques (stem injection, cut stem, and foliar applications) for knotweed control on county rights-of-way. The results of these experiments were used to write the current knotweed IPM prescription. Treatment of Japanese knotweed along rights-of-way began in 2005. In 2006, there were 296 knotweed applications and in 2010 there were only about 50 applications. Besides a reduction in applications since 2006, there has been a significant reduction in the knotweed infestation size. Also in 2005, a great deal of Scotch broom was growing at the Roads Maintenance Facility located on Tilley Road in sand and gravel storage piles. These plants became a seed source that required control to stop the spreading of Scotch broom by county equipment.

In 2010, the County monitored 794 noxious weed infestations and 384 (48.4%) had noxious weeds growing on them, an increase of 7.5% from 2009. Herbicides were used at less than a quarter (23%) of these weed sites with the remaining sites controlled manually. Manual control continues to be the most widely used control method for most noxious weed species in Thurston County.

The increase in pesticide use from 2009 was due to three stem injection applications for knotweed (spp.) control in areas where foliar applications may migrate to neighboring wetlands. Stem injection utilizes a higher concentration of product and must be injected into each plant stem (over 1,200 stems injected). If these plants were treated with a foliar application, the noxious weed program would have used less herbicide than 2009. Direct injection applications are expected to minimize herbicide mobility. Table 1 shows a three year summary of the County's noxious weed control for both manual and chemical control efforts.

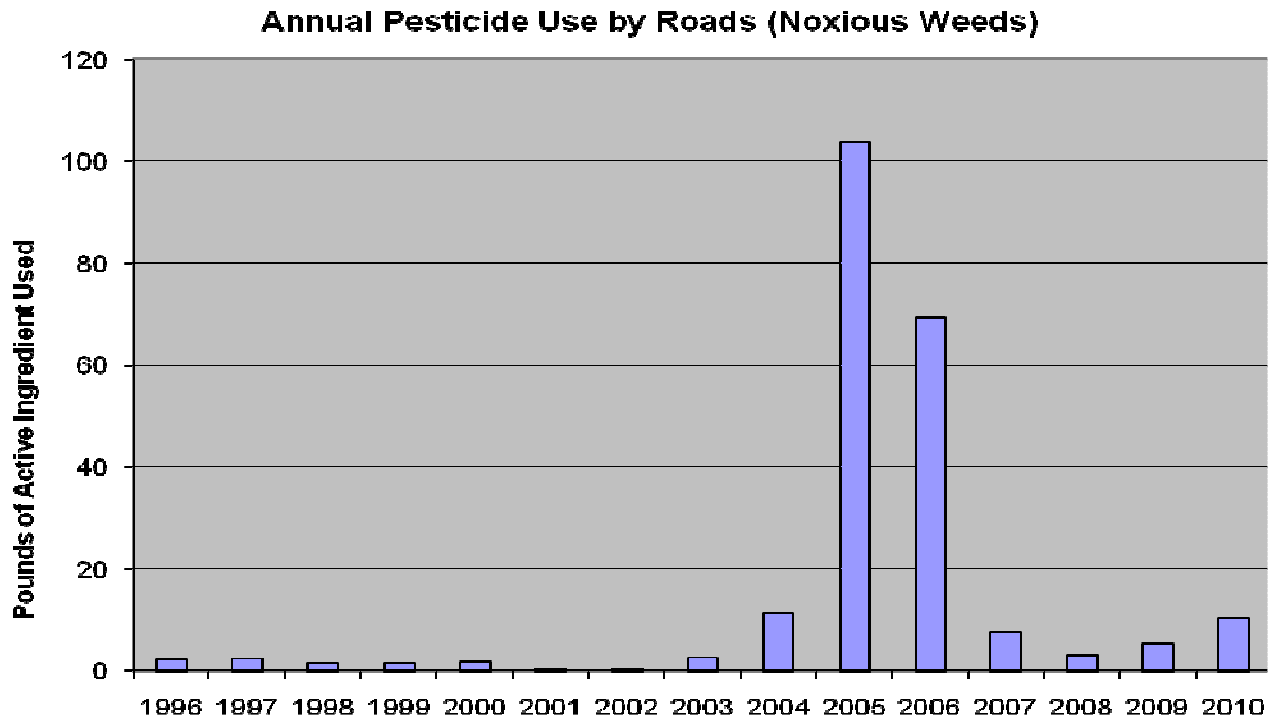


Figure 6 – Total pesticides used by the Noxious Weeds Program

Table 1: Noxious Weed Control Yearly Summary

	Noxious Weed Sites on Rights of Way and Parcels Owned and Maintained by Thurston County																							
	Combined monitored sites plus new sites found			Sites with active weeds			Number of sites treated with herbicide			Number of Sites Controlled Manually			New Sites			New Sites Treated			Number of New Sites Controlled Manually			Sites Eradicated (After three consecutive years of monitoring with no growth)		
	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010	2008	2009	2010
Annual Bugloss	2	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
Blueweed	0	1	1	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	0	
Butterfly Bush	8	14	14	6	9	1	6	5	0	0	4	1	5	6	0	5	2	0	0	4	0	0	0	
Wild Chervil	300	282	239	147	104	100	39	3	2	108	101	98	55	8	19	6	1	1	49	7	18	26	62	33
Spurge Laurel	0	0	96	0	0	94	0	0	0	0	0	94	0	0	90	0	0	0	0	0	90	0	0	0
Diffuse Knapweed	8	6	7	1	0	4	0	0	0	1	0	4	1	0	4	0	0	0	1	0	4	2	3	2
Common Fennel	8	9	8	4	2	3	0	0	1	4	2	2	1	0	2	0	0	1	1	0	1	0	3	2
Giant Hogweed	1	2	2	1	1	0	0	1	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0
Gorse	12	12	12	6	6	5	3	0	0	3	6	5	0	0	2	0	0	0	0	0	2	3	6	4
Bohemian Knotweed	189	190	161	78	74	69	54	48	50	24	26	19	3	6	8	3	5	7	0	1	1	5	37	38
Giant Knotweed	12	12	8	2	5	3	0	3	0	2	2	3	0	1	1	0	0	1	0	1	0	1	4	3
Japanese Knotweed	6	6	2	2	0	0	0	0	0	2	0	0	1	0	0	0	0	0	1	0	0	0	4	0
Himalayan Knotweed	2	2	1	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0
Mouseear Hawkweed	26	31	31	21	21	15	14	3	8	7	18	7	7	5	3	4	2	1	3	3	2	0	3	1
Meadow Knapweed	61	68	66	35	31	29	4	3	13	31	28	16	16	10	4	1	0	1	15	10	3	4	7	9
Milk Thistle	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Orange Hawkweed	4	5	7	3	5	6	1	0	2	2	5	4	1	1	2	1	0	2	0	1	0	0	0	0
Perennial Pepperweed	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
Perennial Sowthistle	5	5	5	5	3	0	0	2	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Poison Hemlock	104	69	64	35	30	25	13	3	3	22	27	22	9	6	7	0	0	1	9	6	6	39	11	10
Purple Loosestrife	3	4	4	0	3	0	0	1	0	0	2	0	0	2	0	0	1	0	0	1	0	1	1	1
Rush Skeletonweed	2	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
Scotch Thistle	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Scotch Broom	0	2	0	1	8	0	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spanish Broom	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spotted Knapweed	40	40	44	13	18	18	0	2	4	13	16	14	3	9	9	0	0	2	3	9	7	9	6	8
Tansy Ragwort*	22	17	19	11	9	11	1	2	4	10	7	7	3	2	3	0	0	0	3	2	3	7	0	1
Dalmatian Toadflax	1	2	1	0	1	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
Yellow Starthistle	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<i>All Species</i>	818	782	794	372	335	384	136	86	87	236	249	297	105	60	154	20	14	17	85	46	137	101	149	112

Lbs of manually controlled weeds 16,750 5,279 8,900 *Tansy ragwort is widespread throughout the county. Individual site records are only maintained for parcels, and the rights-of-way are controlled primarily by manual means. After removal, tansy is taken to transfer stations where it is weighed.

Table 1: Thurston County 2009 Pesticide Applications

Program	Pest Problem	Location	Date	Applicator	Product	Quantity
Noxious Weeds Program	Hawkweed (spp.)	10 applications	5-7/10	Contractor	Milestone	2 gal mix/ 2 oz. product
	Wild Chervil	3 applications	5-6/10	Contractor	Habitat	1.25 gal mix / 1.6 oz product
	Poison Hemlock	2 applications	5/10	Contractor	Habitat	4 gal mix / 5 oz product
	Poison Hemlock	1 application	5/10	Contractor	RoundUp Pro	0.5 gal mix / 1.28 oz product
	Knapweed (spp.)	17 applications	6-7/10	Contractor	Milestone	7 gal mix / 0.9 oz product
	Common fennel	Forstrom Rd SW	7/10	Contractor	RoundUp Pro	0.125 gal / 0.32 oz. product
	Knotweed (spp.)	47 applications	6&9/10	Contractor	Habitat	47.2 gal mix / 120 oz product
	Knotweed (spp.)	3 applications	9/10	Contractor	Aquamaster	1.9 gal mix / 245 oz product
	Tansy ragwort	4 applications	7/09	Contractor	Milestone	18 gal mix / 2.25 oz product
Solid Waste (WARC)	Weeds and Grass	Waste and Recovery Center	3-8/10	County Employee	RoundUp Pro	17 gallons mix / 34 fluid oz product
Central Services	Moisture Ants	Bldg. 2	8/10	Contractor	Phantom	2.6 oz product
	Rodents	Medic 1	2010	Contractor	Generation Bait	129 blocks @ 0.71 oz / block = 92 oz product
	Yellow Jackets	Bldg. 1 and 2	2010	Contractor	Drione	1.9 oz product
Water Resources (Lakes)	Potamogeton and Najas	Long Lake	4-5/10	Contractor	Sonar Q	1,790 pounds product
	Potamogeton and Najas	Lake Lawrence	4-5/10	Contractor	Sonar Q	1,803 pounds product
Parks Program	Yellow Jackets	Royal Oaks	2010	County Employee	Spectracide Wasp and Hornet Killer	20 oz product
	Perennial Weeds	Kenneydell Park	2010	County Employee	RoundUp Pro	7 gal. mix / 14 oz product
	Perennial Weeds	Stormwater Ponds	2010	County Employee	RoundUp Pro	1.5 gal. mix / 1 oz. product

Program	Pest Problem	Location	Date	Applicator	Product	Quantity
	Perennial Weeds	County Facilities	2010	County Employee	RoundUp Pro	53 gal mix / 94 oz. product
Glacial Heritage Preserve	Eurasian grasses	Glacial Heritage	2010	Nature Conservancy	Poast	857 Gal mix / 1,645 oz. product
	Scotch Broom	Glacial Heritage	2010	Nature Conservancy	Garlon 4	1,064 gal mix / 2,518 oz or 19.7 gal. product
	Scotch Broom	Glacial Heritage	2010	Nature Conservancy	RoundUp	337.5 gal mix / 1,248 oz. or 9.75 gal product

Table 2: Thurston County 2010 Pesticide Application Totals

Department	Product	Amount of Product	Amount of Active Ingredient (based on acid equivalents)	Amount of Product and Mix Applied
Noxious Weeds Program (Roads)	¹ RoundUp Pro	1.6 fluid oz	Glyphosate = 0.05 pounds	0.625 gallons
	² Aquamaster	245 fluid oz	Glyphosate = 7.7 pounds	2.5 gallons
	³ Habitat	126 fluid oz	Imazapyr = 2 pounds	52.4 gallons
	⁴ Milestone	3.4 fluid oz	Aminopyralid = 0.05 pounds	26.8 gallons
Solid Waste (WARC)	¹ RoundUp Pro	34 fluid oz	Glyphosate = 1 pounds	17 gallons
Parks Program	¹ RoundUp Pro	121 fluid oz	Glyphosate = 3.8 pounds	67.5 gallons
	⁹ Spectracide	20 fluid oz	Prallethrin = 0.005 oz Lambda cyhalothrin = 0.002 oz	0.16 gallons
(Glacial Heritage Preserve)	⁵ Garlon 4 Ultra	2,518 fluid oz	Triclopyr = 78.8 pounds	1,064 gallons
	¹ RoundUp	1,248 fluid oz	Glyphosate = 39 pounds	337.5 gallons
	⁹ Poast	1,645 fluid oz	Sethoxydim = 19.2 pounds	857 gallons
Water Resources Program (Lakes)	⁷ Sonar Q	57,488 oz	Fluridone = 180 pounds	3,593 pounds
Central Services	⁸ Generation Bait	92 oz	Difethialone = 0.002 ounces	5.7 pounds
	¹⁰ Phantom	2.6 oz	Chlorfenapyr = 0.56 ounces	0.16 pounds
	¹¹ Drione	1.9 oz	Silica gel = 0.76 oz Piperonyl butoxide = 0.19 oz Pyrethrins = 0.019 oz	0.12 pounds

¹Roundup Pro has 4# acid equivalents/gallon product ²Aquamaster has 4# acid equivalents/gallon product ³Habitat has 2# acid equivalents/gallon product ⁴Milestone has 2# acid equivalents/gallon
⁵Garlon 4 Ultra has 4# acid equivalents/gallon product ⁶Poast has 1.5# acid equivalents/gallon product ⁷Sonar Q and PR have 5% fluridone by weight ⁸Generation bait - 129 blocks x 0.71 oz per block = 92 oz product at 0.0025% = 0.002 oz difethialone ⁹Spectracide is a % by volume calculation (prallethrin at 0.025%) and (Lambda cyhalothrin at 0.01%)
¹⁰Phantom is a % by volume calculation (chlorfenapyr at 21.4%) ¹¹Drione is % by volume calculation (silica gel at 40%, piperonyl butoxide at 10% and pyrethrins at 1%)

Table 3: Summary of Pesticide Applications from 1996 to 2010 by Department:

	Noxious Weeds	Parks & Preserve	Solid Waste (WARC)	Water Resources	Central Services	Total Product Used
1996	Roundup = 94 oz	Roundup = 1,719 oz or 13.43 gal	Combined with Parks data	Tempo 20 WP = 1 oz product Drione Dust = .25 oz Vengeance = 2 oz Rodeo = 5220 oz	Tempo 20 WP = 12.68 oz Drione dust = .5 oz Gentrol = 3.5 oz	7,042.04 oz = 440.13 lbs
1997	Roundup = 106.25 oz Manage = 20.25 g / .71 oz Stinger = 2.5 oz	Roundup = 1,044.48 oz or 8.16 gal	Combined with Parks data	Rodeo = 1318 oz	No applications	2,471.94 oz = 154.50 lbs
1998	Roundup = 42 oz Manage = 10.8 g / .38 oz Stinger = 28.5 oz	Roundup Pro = 392 oz or 3.06 gal	Combined with Parks data	No applications	Tempo 20% WP = 76 g / 2.68 oz Drione Dust = 48 oz	513.56 oz = 32.10 lbs
1999	Roundup = 61.875 oz Manage = 1.46 g / .05 oz Stinger = 4.7575 oz	Roundup = 793.6 oz or 6.2 gal Enforcer (Wasp) = 12 oz can	Combined with Parks data	No applications	No applications	872.28 oz = 54.52 lbs
2000	Roundup = 78.29 oz Manage = .05 oz Stinger = .16 oz	Roundup = 1,548 oz or 12.09 gal Fast Trac = .56 oz	Combined with Parks data	No applications	Tempo 20% WP = .84 oz Drione Dust = 1.25 oz	1,629.15 oz = 101.8 lbs
2001	Roundup = 16.62 oz Manage = 1.58 g. or .05 oz Transline = .14 oz	Roundup = 2,475 oz or 19.34 gal Spectracide = 40 oz Ortho Hornet & Wasp = 24 oz	Combined with Parks data	No applications	No applications	2,555.81 oz = 159.7 lbs

	Noxious Weeds	Parks & Preserve	Solid Waste (WARC)	Water Resources	Central Services	Total Product Used
2002	Roundup = 20 oz	Roundup = 9,649 oz or 75.38 gal Fastrac = 32 g or 1 oz	Combined with Parks data	No applications	Drione = 2 oz Tempo 20 WP = 1 oz	9,673.13 oz = 604.57 lbs
2003	Roundup = 112 oz Transline = 1.98	Roundup = 5,030.33 oz or 39 gal	Combined with Parks data	Rodeo = 270 oz	Contrac Blox = 51.25 oz	5,466.16 oz = 341.64 lbs
2004	Roundup = 183.6 oz Aquamaster = 224.0 oz	Roundup = 2226.6 oz / 17.4 gal Fast Trac Blox = 96g = 3.4 oz	Combined with Parks data	Rodeo = 180 oz product	Contrac Blox = 46 oz Tempo 20 WP = 12 oz Talstar 1 = 8 oz Drione Dust = 0.2 oz Phantom = 34.5 oz	2,919.1 oz = 182.44 lbs
2005	Roundup = 112 oz Aquamaster = 3,322.2 oz	Roundup = 1,957.5 oz	Combined with Parks data	No applications	Contrac Blox = 122 oz Tempo 20 wp = .88 oz Drione dust = .5 oz	5,515.68 oz = 344.73 lbs.
2006	Roundup = 32 oz Rodeo = 154 oz Aquamaster = 1,427.46 oz Habitat = 1,129 oz Milestone = 96 oz	Glyphosate = 585.5 oz	Combined with Parks data	Rodeo = 326 oz	Contrac Blox = 36 oz Tempo 20 WP = 10 g = .35 oz Drione Dust = 4 oz Phantom = 28.5 oz	3,819.42 oz = 238.71 lbs
2007	Roundup = 62.9 oz Aquamaster = 7.8 oz Habitat = 311 oz Milestone = 60 oz	Glyphosate = 6,660.5 oz / 52 gal	Combined with Parks data	Glyphosate = 1203 oz AquaPro = 2227 oz Fluridone = 720.2 oz or 55.4 lbs Sonar-PR ¹ = 1,107 pounds	Generation Bait = 30.3 oz Tempo 20 WP = 1.5 oz Drione Dust = 7 oz Phantom = .25 oz	9,065.15 oz = 566.6 lbs
2008	Roundup = 18 oz Habitat = 123.9 oz Milestone = 5.6 oz	Glyphosate = 738 oz / 5.77 gal Garlon 4 = 2551.6 oz / 20 gal	Combined with Parks data	Glyphosate = 2,406.2 oz product AquaPro = 4,454 oz Fluridone = 1,505 oz or 94 lbs. Sonar-PR ¹ = 1,881 pounds	Generation Bait = 0.09 oz Drione Dust = 2.5 oz Termidor = 0.8 oz	7,352.3 oz = 459.5 lbs

	Noxious Weeds	Parks & Preserve	Solid Waste (WARC)	Water Resources	Central Services	Total Product Used
2009	Roundup = 11.7 oz Habitat = 126.6 oz Milestone = 194 oz Aquamaster = 4 oz	RoundUp = 1,600 oz Spectracide Wasp and Hornet Killer= 60 oz. Milestone = 44 oz Garlon 4 =1,248 oz.	Round up = 248 oz	Glyphosate = 128 oz AquaPro = 243 oz Sonar PR ¹ = 45,472 oz	Generation Bait = 0.12 oz Tempo 20wp = .75 oz	49,380 oz = 3,086 lbs
2010	RoundUp Pro = 1.6 oz Aquamaster = 245 oz Habitat = 126 oz Milestone = 3.4 oz	RoundUp = 1,369 oz Spectracide Wasp and Hornet Killer= 20 oz. Poast = 1,645 oz Garlon 4 Ultra = 2,518 oz.	RoundUp Pro = 34 oz	Sonar Q = 57,488 oz	Generation Bait = 92 oz Phantom = 2.6 oz Drione = 1.9 oz	