

# **King County Noxious Weed Control Board**

## **2005 Annual Report**



**King County**

Department of Natural Resources and Parks

King County  
Noxious Weed Control Board

**2005 Annual Report**



**King County**

Department of Natural Resources and Parks  
Water and Land Resources Division

**Noxious Weed Control Program**

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*Earth Day, 2005: Staff and volunteers work together to remove invasive wetland weeds.*

### Special Thanks to:

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*On the cover: gorse (Ulex europaeus), a Class B noxious weed.*

# TABLE OF CONTENTS

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KING COUNTY NOXIOUS WEED CONTROL BOARD	ii
2005 NOXIOUS WEED CONTROL PROGRAM STAFF	ii
TABLE OF APPENDICES	iv
TABLES AND FIGURES	iv
LETTER FROM THE CHAIR	v
THE IMPACTS OF NOXIOUS WEEDS	7
MISSION AND GOALS	9
MAJOR RESULTS	10
Eradication of Class A Noxious Weeds	10
Control of Designated Class B Noxious Weeds	12
Citizen Participation in Weed Control and Other Major Performance Measures	13
EDUCATION AND OUTREACH	15
COUNTY LANDS	20
2005 County Lands Highlights	20
AQUATIC AREAS	22
Other 2005 Highlights	23
STATE AND FEDERAL LANDS	25
Washington State Department of Transportation (WSDOT)	25
Washington State Department of Fish and Wildlife (WDFW)	26
Washington State Parks	26
Washington State Department of Natural Resources (WDNR)	26
Port of Seattle	26
GEOGRAPHIC INFORMATION SYSTEM (GIS) TECHNOLOGY	27
PLANNING AND COORDINATION	28
INTEGRATED PEST MANAGEMENT	30
2005 Biological Control Highlights	31
CONCLUSIONS	32
REFERENCES	32

## APPENDICES

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Appendix A	2005 King County Noxious Weed List
Appendix B	Known Noxious Weed Sites: Cumulative 1996-2005
Appendix C	New Infestations on Parcels: Selected Weeds 1999-2005
Appendix D	Profiles of King County's Top Four Noxious Weeds Tansy Ragwort Giant Hogweed Spotted Knapweed Purple Loosestrife
Appendix E	Known Noxious Weed Locations Map: Cumulative Data 1996-2005
Appendix F	Number of Active Noxious Weed Sites by Council District
Appendix G	Top 20 Noxious Weeds Found in King County 1999 to 2005
Appendix H	Control of Noxious Weeds in King County: 1999-2005 Noxious Weeds in King County: Number of Infestations Found and Controlled 1999-2005
Appendix I	Results from Customer Survey Cards

## TABLES AND FIGURES

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		Page
Figure 1:	The Results of an Effective Noxious Weed Control Program over Time	8
Table 1:	Control of Class A Noxious Weeds on Parcels in King County 1999-2005	11
Figure 2:	Control of Class A Noxious Weeds by Area in King County 1999-2005	11
Figure 3:	Control of Class B Noxious Weeds by Area in King County 1999-2005	12
Table 2:	Control of Class B Noxious Weeds on Parcels in King County 1999-2005	13
Table 3:	Program Performance Indicators 1999-2005	14
Figure 4:	New Customer Survey Form	15
Table 4:	Education and Outreach Activities 2000-2005	19
Figure 5:	Number of Noxious Weed Sites on King County Lands 2002-2005	21
Table 5:	Aquatic Critical Area Weed Control in 2005	23
Table 6:	Washington State Department of Transportation Sites	25
Table 7:	Comparison of 2005 Landholder Noxious Weed Control Methods	30

## LETTER FROM THE CHAIR

Thank you for taking the time to read the annual report of the King County Noxious Weed Control Program. As Chair of the Noxious Weed Control Board, one of my responsibilities is to ensure that the noxious weed program is accountable to citizens and that they are receiving value for their investment.

I believe that the program is one of the most cost-effective in the county. It has a clearly defined mission and strategy. This strategy describes program objectives, major activities and performance standards to measure success. The 2005 Annual Report clearly describes the excellent progress made over the past year towards achieving these objectives.

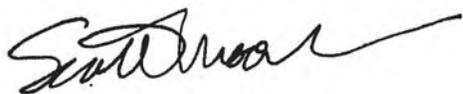
Prevention and minimization of potential impacts is one of the most important components of our noxious weed strategy. Overall, the program acts effectively as an insurance policy against the huge potential environmental economic and social costs of invasive weed species.

Large areas of the county are still heavily infested with noxious weeds and other invasive plants. Many of these have developed over a long period of time when the seriousness of this issue was less well recognized. Ignorance is no longer an acceptable excuse.

Only a well coordinated, long-term approach can have an effect on a landscape-scale problem of this nature. The King County Noxious Weed Control Program is the cornerstone of this process. To be successful, this work must engage all stakeholders, including governments, landowners, community groups and industry.

Doing nothing is making a decision to allow the problem to get worse and passing the buck to the next generation. It means leaving public and private lands in a poorer condition, less capable of producing the benefits we currently enjoy. Citizens of the county are fortunate to have this excellent program to ensure this does not occur.

Thank you for your interest and participation in this important work. Together we can make a difference.



Scott Moore

Chair

King County Noxious Weed Control Board



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## The Impacts of Noxious Weeds

Noxious weeds are invasive plants that can cause such significant damage, landowners are required to control or eradicate them under the Washington State Weed Law. Of the tens of thousands of introduced plant species available, only a small fraction threaten our economy, environment or public health sufficiently to achieve this status. The 2005 King County Noxious Weed List contains 111 plant species that meet these criteria (see Appendix A).

Though small in number of species, the existing or potential impacts of these weeds are huge. These impacts can be summarized as:

- 1) Economic impacts to agriculture: Noxious weeds reduce the productivity of agricultural lands and add additional management costs. At the national level, agricultural losses to weeds total \$26.4 billion (Mack 2000, Pimental et al 2000). This figure includes significant losses in King County, one of the more agriculturally productive counties in the one of the most agriculturally productive states (USDA 2002). For example, the noxious weeds tansy ragwort



**Rutherford Slough has been severely degraded due to noxious weeds that choke out native vegetation and damage lakeshore and wetland ecosystems.**

(*Senecio jacobaea*) and milk thistle (*Silybum marianum*) are significantly reducing the productivity of grazing lands. In addition, King County is a point of entry for noxious weeds which have serious economic impacts in other agricultural regions of Washington state.

- 2) Environmental impacts: Noxious and other invasive weeds also pose an extreme threat to the environmental health of natural areas in King County. They alter ecosystems through disruption of food chains, out-competing native plants and reducing habitat for native wildlife. Invasive species, including weeds, are widely recognized as having a significant negative impact on wildlife

biodiversity, ranking second only to habitat destruction in threatening the extinction of endangered species (USDA Forest Service 2003). For example in King County, Japanese knotweed (*Polygonum cuspidatum*) and its hybrids and garden loosestrife (*Lysimachia vulgaris*) are degrading areas of important streamside salmon habitat.

3) Public health impacts: Many noxious weeds have toxic qualities, posing a public health threat, such as the highly toxic poison hemlock (*Conium maculatum*) and giant hogweed (*Heracleum mantegazzianum*) which has sap which causes severe burns.

4) Recreational impacts: Other noxious weeds can significantly reduce the recreational value of public open space and aquatic areas. For example, the aquatic weeds Brazilian elodea (*Egeria densa*) and hydrilla (*Hydrilla verticillata*) can clog waterways, seriously disrupting boating and swimming.

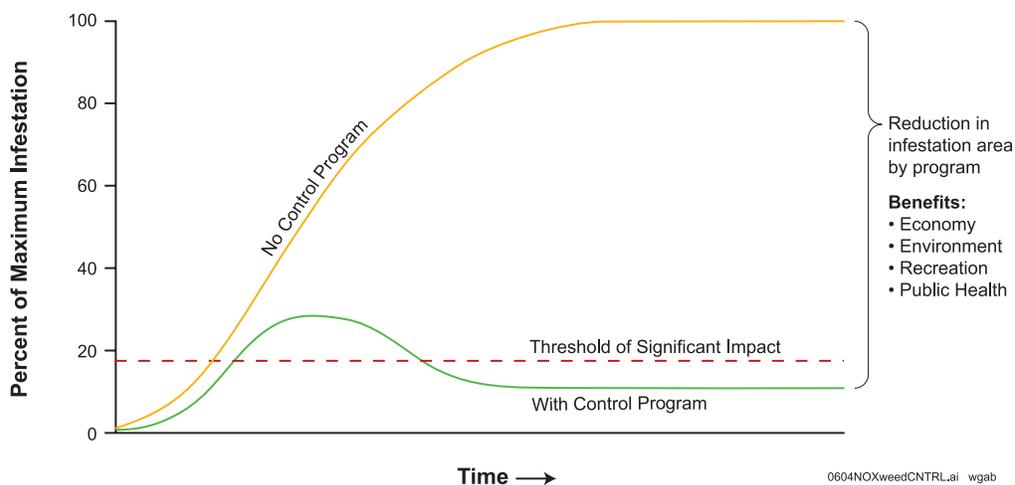


**Milk thistle (*Silybum marianum*), is a Class A weed in Washington state. Class A weeds have limited distribution; preventing new infestations and eradicating existing ones is the highest priority.**

The State Weed Law (RCW 17.10) requires all landowners to eradicate Class A noxious weeds and control designated Class B and county-selected Class C noxious weeds on their properties.

The King County Noxious Weed Control Program (KCNWCP), under the direction of the King County Noxious Weed Control Board, develops and implements the county response to the serious issue of noxious weed invasion. The general effect of a successful noxious weed program over time is summarized in Figure 1. This report summarizes the program’s activities in 2005, progress towards achieving its objectives and the benefits these have produced for King County citizens.

**Figure 1: The Results of an Effective Noxious Weed Control Program over Time**



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## Mission and Goals

The King County Department of Natural Resources and Parks (DNRP) has the vision of:

**Sustainable and livable communities—clean and healthy natural environment.**

Working towards this vision, the mission of the King County Noxious Weed Control Program is:

**To reduce or prevent impacts of noxious weeds on the environment, recreation, public health and the economic resources of King County.**

The program will achieve this mission by working towards the following operational goals:

1. Eradicating existing infestations and preventing new invasions of Class A noxious weeds
2. Controlling designated Class B noxious weeds to below the threshold levels of significant impacts
3. Educating the community of stakeholders about prevention and management of noxious weed infestations, and increasing participation in noxious weed control activities.

This mission and these goals were defined through the development of a strategic plan for the program under the direction of the King County Noxious Weed Control Board. This strategic plan was also used to help develop program priorities and activities in 2005 and to manage and measure its performance. This annual report describes the progress made in 2005 towards achieving these goals, mission and long-term vision.



*Staff provide technical assistance and education on eradicating high priority noxious weed infestations. Seasonal weed specialist Karen Peterson (above left) oversees a garlic mustard (*Alliaria petiolata*) work party. Educational specialist Sasha Shaw (above right) gathers a sulfur cinquefoil (*Potentilla recta*) sample for a workshop.*

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## Major Results

King County was extensively surveyed in 2005 in order to detect new weed infestations and measure changes in the extent of known infestations. Citizen and other stakeholder reports of new infestations were quickly verified. Program staff subsequently worked with the responsible landowners to achieve the required level of weed control. The effectiveness of weed control activities for each infestation were then monitored.

### ***Eradication of Class A Noxious Weeds***

There are 30 Class A noxious weeds designated for control in King County. These weeds are listed in Appendix A. Eleven of these weeds have been recorded as growing in some part of the county. The goal for these weeds is eradication of existing infestations and prevention of new invasions. The following significant progress was made in 2005 towards achieving this goal:

- *Prevented invasions of new Class A noxious weed species*

There were no invasions of new Class A noxious weed species recorded in 2005.

- *Eradicated 60% of the Class A noxious weed area found to date*

Good progress was made towards the eradication of Class A noxious weeds known to occur in the County. Sixty percent of the area of Class A weeds found since the commencement of the program has now been eradicated<sup>1</sup> (Figure 2). Two Class A noxious weeds (buffalobur and velvetleaf) have been eradicated from King County. Forty-one percent of Class A infestations have had no weeds present for three or more years.

- *Controlled 94% of Class A noxious weed infestations found in 2005*

There were 1091 Class A weed infestations found on parcels in King County in 2005, 94% of which were controlled<sup>2</sup> (Table 1). Ninety-two percent of the total area of these infestations was controlled. Of the Class A infestations found in 2005, 127 were new discoveries, including significant numbers of new garlic mustard and giant hogweed infestations in Seattle and milk thistle infestations in south King County.

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<sup>1</sup> Based on comparing area found in 2005 with the cumulative area found since 1996.

<sup>2</sup> Defined as containment and prevention of seed production or propagation.

**Table 1: Control of Class A Weeds on Parcels in King County 1999–2005**

<b>Class A Weeds</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Number of Infestations Surveyed	740	903	892	949	1014	897	1091
Number Controlled	661	754	796	888	904	811	1027
Percent Controlled	89%	83%	89%	94%	89%	90%	94%
Percent of Area Controlled	82%	96%	74%	83%	72%	81%	92%

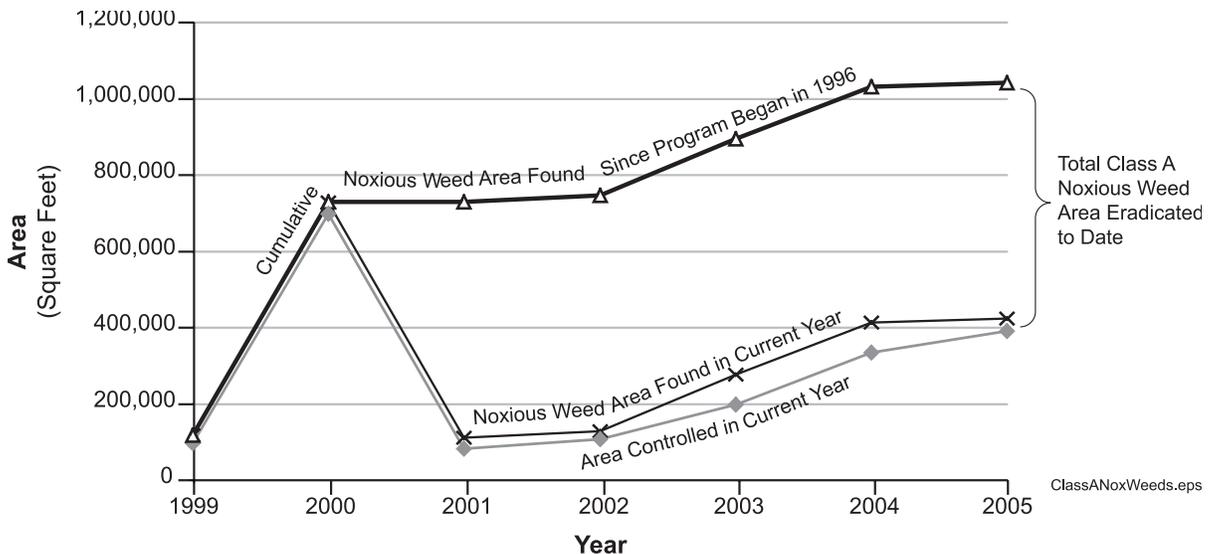


**The Class A weed velvetleaf (*Abutilon theophrasti*) has been eradicated from King County.**

**No garlic mustard (*Alliaria petiolata*) infestations were allowed to go to seed in 2005.**



**Figure 2: Control of Class A Weeds by Area in King County 1999–2005**



## Control of Designated Class B Noxious Weeds

There are 52 Class B noxious weeds designated in King County (Appendix A). The program's operational goal is to achieve control<sup>1</sup> of these weeds, bringing them to below the threshold levels of significant impact. The following progress was made in 2005 towards achieving this goal:

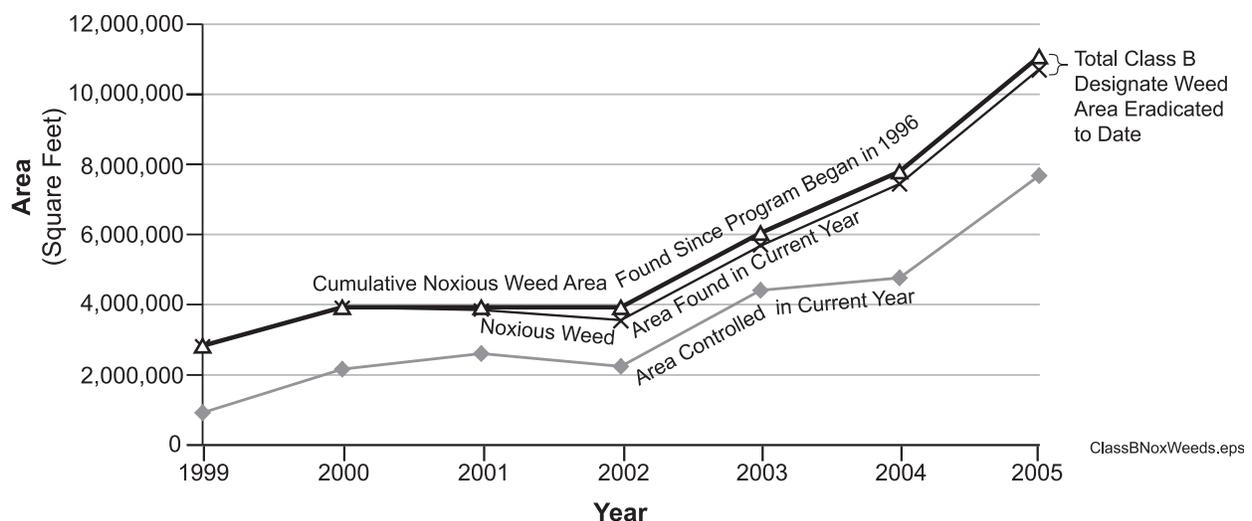
- *Eradicated 3% of the Class B noxious weed area found to date*

As the program is able to survey more properties and roads in the county each year, the area of Class B noxious weeds found continues to increase. Of the area infested by Class B noxious weeds in 2005, 17% was in new infestations. Control of seed production and containment is the overall goal for designated Class B noxious weeds, rather than eradication. To date, 3% of the area of Class B weeds found since the commencement of the program has been eradicated<sup>2</sup> (Figure 3).

- *Controlled 78% of designated Class B noxious weed infestations found in 2005*

Of the 3,532 designated Class B weed infestations that were found on parcels in King County in 2005, 78% were controlled. Expressed in terms of total area of infestation, 72% of the area found in 2005 was controlled (Table 2). Of the Class B weed infestations found in 2005, 548 were new discoveries. In general, for Class B noxious weed infestations found every year, the majority are controlled even though significant new areas of infestation are found each year (Table 2 and Figure 3). In 2005, a higher percentage of the large sites were controlled due to an increased focus on priority sites.

**Figure 3: Control of Class B Weeds by Area in King County 1999–2005**



<sup>1</sup> Defined as containment and prevention of seed production or propagation.

<sup>2</sup> Based on comparing area found in 2005 with the cumulative area found since 1996.

## ***Citizen Participation in Weed Control and Other Major Performance Measures***

Through an extensive range of education and outreach activities, the noxious weed control program seeks to increase the awareness, knowledge and participation of landholders and other stakeholders in weed management. A summary and five-year comparison of measures of landholder participation and other major performance measures is shown in Table 3. Highlights of these include:

- *Discovered 964 new noxious weed infestations in 2005*

The total number of known noxious weed infestations in King County is steadily increasing as 966 new weed infestations were discovered in 2005 (Table 3). New infestations that were most frequently identified were tansy ragwort, giant hogweed, spotted knapweed and purple loosestrife (Appendix C). This is the result of the effective, on-going weed survey effort as well as high levels of citizen reporting, participation and involvement.



***Citizen participation in weed control is key to achieving the program's goals.***

There are now records of 10,416 noxious weed infestations in King County (Table 3). A breakdown of these showing the number of infestations by weed species is given in Appendix B. A complete description of the number of infestations found from 1999 to 2005 for the 20 most common noxious weeds is given in Appendix G.

- *Continued high overall level of noxious weed control*

Overall, 80% of the recorded noxious weed infestations were controlled in 2005. This is similar to the high levels of control achieved in 2004 and 2003 and significantly greater than the general level of control achieved in the years prior to this (Table 3).

**Table 2: Control of Class B Weeds on Parcels in King County 1999–2005**

<b>Class B Weeds</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Number of Infestations Surveyed	1425	2302	2755	2888	3876	3696	3532
Number Controlled	926	1501	2234	2046	3107	3048	2745
Percent Controlled	65%	65%	81%	71%	80%	82%	78%
Percent of Area Controlled	33%	55%	68%	63%	80%	64%	72%

**Table 3: Program Performance Indicators 1999–2005**

<b>Weed Control</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Number of infestations: cumulative	3099	4655	5769	6957	8037	9634	10416
Number of infestations surveyed each year	2876	4337	4894	5191	6506	6443	6786
Percent of infestations controlled <i>(Control is defined as management action to prevent seeding or spread of a noxious weed)</i>	73%	72%	77%	72%	82%	80%	80%
Percent of infestations surveyed that were voluntarily controlled	64%	64%	69%	62%	74%	73%	71%
Percent of infestations surveyed controlled by weed program staff	8%	10%	10%	10%	10%	8%	11%
Percent of infestations surveyed controlled by enforcements	1.0%	0.0%	0.2%	0.7%	0.2%	0.0%	0.1%
Percent of infestations with no weeds seen in current year	26%	30%	38%	40%	45%	51%	39%
Number of new sites <i>(defined as those recorded for the first time that year)</i>	1091	1558	1189	1197	1081	732	966
Percent of total infestations that are new	38%	36%	24%	23%	17%	11%	14%
<b>Landowner Notifications</b>							
Total number of notifications	1286	1615	2043	2005	2159	3382	3775
% notifications done by mail or email	60%	72%	80%	74%	76%	86%	75%
% notifications done by phone or fax	16%	13%	9%	11%	11%	6%	8%
% notifications done in person or by doorhanger	24%	15%	12%	15%	13%	9%	16%
<b>Infestation Reports</b>							
Number of infestation reports	200	292	220	332	143	134	189
Percent of infestation reports checked	88%	91%	80%	89%	90%	91%	88%
Percent of reports confirmed correct	73%	74%	74%	79%	66%	59%	64%

- *Customer service survey cards show an overwhelming “A” rating of the program*

In 2005, the Noxious Weed Control Program launched its first large-scale public survey. Almost one thousand customer service survey cards were mailed to landowners who had been contacted by staff regarding noxious weeds (Figure 4). The survey cards asked a variety of questions such as:

- Did our staff provide advice and answer questions?
- Was our staff professional and courteous?
- If you received educational materials, did you find them helpful?

We also asked landowners to grade their overall experience working with the King County Noxious Weed Control Program. Of the 156 survey cards received back, 72% give the program an “A” as an overall grade.

The survey cards also asked for additional comments. Many landowners took the opportunity to give both praise and suggestions for improving the program. (See Appendix I)

- *Increased stewardship and community participation in noxious weed management*

Program staff undertook a wide range of education and outreach activities seeking to increase the level of community participation in noxious weed management and the stewardship of publicly owned natural lands. These activities are described in detail in the relevant major activity reports that follow.

**Figure 4: New Customer Survey Form**

**HOW IS OUR CUSTOMER SERVICE?**

1. What noxious weed(s) did we contact you about? \_\_\_\_\_

2. How were you contacted regarding the infestation? (Check as many as appropriate)  
 Email     Phone     Letter     Doorhanger     In person

(Please check one for each of the following questions)

	Definitely Yes ✓	Somewhat Yes ✓	Somewhat Not ✓	Definitely Not ✓
3. Once notified, did our staff clearly explain what was expected of you to address the weed problem?	_____	_____	_____	_____
4. Did our staff provide advice and answer questions?	_____	_____	_____	_____
5. Was our staff professional and courteous?	_____	_____	_____	_____
6. If you received educational materials, did you find them helpful?	_____	_____	_____	_____
7. Overall, how would you grade your experience working with the King County Noxious Weed Control Program? (Please circle one. A=Excellent/F=Failing)	A	B	C	D    F

Please include any additional comments or recommendations you may have for the program.

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## Education and Outreach

Community and landowner education is the single most important activity of the King County Noxious Weed Control Program. The program aims to achieve an informed community of stakeholders with effective participation in the prevention and management of noxious weed infestations. Informed and committed citizens are the key to the management of noxious weeds in King County. To achieve a knowledgeable and engaged community, the program carries out a wide range of outreach and training activities targeted to reach the key stakeholder groups in the county.

The 2005 outreach and communication program carried out the following initiatives:

1. Delivered the message that the impact of invasive weeds is a high-priority problem that affects all county citizens
2. Increased visibility of our program to key audiences and to the general public
3. Improved communications with rural landowners and delivered the message that our program is an ally and a resource for the property owner, not simply a regulatory agency
4. Fostered positive relationships with key communities, stewardship groups and agencies and increased our usefulness as a resource to these groups
5. Improved the noxious weed identification and management skills of vegetation management practitioners in public agencies, community and conservation groups, and the private sector

In 2005, program staff worked individually with over 1,970 landowners, land managers, and public weed management personnel to provide them with the tools



*Do the Puyallup: staff helped spread the word about noxious weeds at the 2005 Puyallup Fair.*

needed to locate and manage regulated noxious weeds on their properties in King County. In addition, program staff answered a broad range of inquiries on invasive and noxious weeds, provided technical handouts on weeds and performed site visits to help property owners identify and manage weeds. The use by the public of the program website continues to increase and program brochures and technical handouts are often downloaded from the web

as well as being requested by mail. Website visitor sessions increased by an impressive 38% in the past year.

In addition to one-on-one technical assistance activities, the program provided outreach to a wide range of groups and neighborhoods through presentations, technical workshops, volunteer work parties, the program website and informational booths. In 2005, the program expanded its workshops to include pasture weeds and natural area invasives. By participating in regional outreach events such as the Puyallup Fair as well as local community events throughout the county, the program was able to reach a broad segment of the general public. In all these cases, the public response was very positive. Particularly in rural areas, the public appreciated and benefited from program staff coming to them with information and advice on managing invasive weeds in a positive, non-regulatory approach.



**Staff showed off a wide array of noxious weeds at the King County Fair in Enumclaw, one of several public outreach events conducted in 2005.**

The program tracks its outreach activities each year. A summary of these data is provided in Table 4. Highlights of the program's education and technical training activities include:

- Fifty-six formal presentations and training workshops on weed identification and management were provided to increase the skill levels of landowners, stewardship groups, federal, state and local agency staff, volunteers and other stakeholders. Pesticide recertification credits were provided for both private and public applicators at several program workshops.
- New for 2005 were several community workshops developed and organized by the program and targeted toward the weed issues facing property owners in particular communities. Workshops were provided for community members in Maple Valley, Snoqualmie-North Bend, Vashon, Seattle, Bellevue, Lake Desire and the Lake Sammamish/Sammamish River area.
- Agencies provided with training in 2005 included EPA-Region 10, University of Washington grounds crew, Washington State Department of Transportation, King County Parks and Transportation crews and municipal vegetation management crews for most cities in the county.
- In 2005, the program worked with many non-profit and community organizations to increase their knowledge about invasive plants. Some of these groups included: Washington Native Plant Society, Picardo P-Patch Gardeners, Enumclaw Garden Club, Kiwanis Club, Woodland Park Zoo, Leschi Community

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Council, Burien Habitat Stewards, Horses for Clean Water, Trout Unlimited, People for Puget Sound, Mountains to Sound Greenway Trust, Vashon-Maury Island Garden Club and the Master Gardeners.

- In addition, program staff contributed to several regional or large-scale seminars and conferences including the Society for Ecological Restoration NW regional conference and the Design to Dirt Workshop for restoration professionals, the City of Seattle Recertification Seminar, and the Green Gardening Program. Program staff also contributed to county training on invasives at Naturescaping workshops and in the Watershed Steward and Forest Steward training programs held by WSU Extension.
- The program provided workshops on noxious weeds for several schools and youth groups including: South Seattle Community College, Kentridge High School, Bellevue's Well Kept Kids Program, Southwest King County Girl Scouts, Vista Footer High School, Bellevue Natural Resource Week and Issaquah's Apollo Elementary School.

Other 2005 highlights of the outreach program include:

- Program staff provided outreach to the public on noxious weeds at 21 community and regional events, including the Northwest Flower and Garden Show, the King County Fair, the Puyallup Fair, Issaquah Salmon Days, Vashon Strawberry Festival, Tukwila Backyard Wildlife Fair, Lake Forest Park Green Fair and Shoreline Natural Yard Care Festival.
- New for 2005 was an email newsletter titled *KC Weed News* that was distributed to interested members of the public and government agencies. Seven issues were produced in 2005, each featuring brief updates and news related to invasive weeds in the county, upcoming workshops and events sponsored by the program and a "Weed of the Month." An email list was developed throughout the year at public events and workshops and by word of mouth. As of December 2005, there were 408 people on the subscriber list.
- The program partnered with several non-profit organizations and municipal programs to carry out volunteer weed pull events including Sammamish River Stewards, People for Puget Sound, Port of Seattle, Seattle Parks and Recreation Department, and Friends of Golden Garden's Off-Leash Area. More than 70 volunteers removed invasive weeds at these events.
- The program continued its positive incentive programs including a formal cost-share program to assist landowners unable to afford noxious weed control and the distribution of solid waste vouchers to private citizens. In 2005, 80 vouchers were given for noxious weed disposal.
- The program achieved significant positive media exposure in 2005, appearing in print, radio and TV news 10 times. Program staff were interviewed by the media seven times. The program generated six official press releases through King County Public Affairs.

- Program staff continued to gather information to update the Best Management Practices (BMP's) for the noxious weeds of most importance to King County citizens and land managers.
- The new urban weeds brochure titled “Neighborhood Bullies: Invasive Weeds in Urban Lands” was widely distributed throughout the county. In addition, many new practical, easy to read Fact Sheets on noxious weeds were distributed at events, by mail and through the website. The practical information and color photos in these fact



**Program staff provided outreach to the public on noxious weeds at 21 community and regional events in 2005.**

sheets greatly improves the program’s ability to provide technical information on noxious weeds to the general public.

- In addition to distributing materials at program events, the program also provided over 8,900 brochures and handouts to county agencies, municipal agencies, schools, and non-profit organizations for their outreach efforts on invasives. In total, the program distributed over 23,000 brochures and handouts.

**Table 4: Education and Outreach Activities 2000–2005**

<b>Education and Outreach Activities</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>
Total audience for presentations (est.)	321	312	988	925	2296	1812
Number of contacts at events (est.)	N/A	N/A	N/A	2800	5596	4783
Number of presentations	31	18	63	45	36	56
Number of public outreach events	N/A	N/A	N/A	9	15	21
Requests for brochures and fact sheets	137	185	209	155	94	166
Technical assistance calls and emails	103	128	124	238	218	343
Other types of technical assistance (including site visits)	51	72	51	23	34	114
<b>Total outreach and education activities</b>	<b>322</b>	<b>403</b>	<b>447</b>	<b>468</b>	<b>397</b>	<b>700</b>
Brochures and bulletins distributed	9,881	23,095	14,634	13,355	20,502	23,393
Website visitor sessions	N/A	N/A	66,061	71,645	81,178	112,197

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## County Lands

King County has direct ownership of approximately 4,000 parcels including parks, trails, open space and stormwater retention ponds. The county also maintains approximately 3,500 linear rights-of-way (ROW) miles along county roads. As a land owner, King County is responsible for controlling listed noxious weeds found on its property.

In an effort to improve the management of noxious weeds on county lands, and to ensure quick resolution of complaints, the King County Council approved a budget proviso during 2002 to create a new County Lands Noxious Weed Specialist position. This dedicated staff member works with the relevant county land managers to ensure that at least the same standard of weed control is achieved on county lands as is required on private lands. This position is also responsible for investigating, tracking and resolving county lands noxious weed complaints.

To reduce the number of complaints, the county lands specialist, working with seasonal weed specialists, surveyed as many county-owned parcels as possible. The primary focus during 2005 was along ROW areas. In addition to surveying, training was provided to roads staff as well as county staff responsible for maintaining stormwater ponds, parks and trails. Training included weed identification, control options and regulations pertaining to weed control activities.

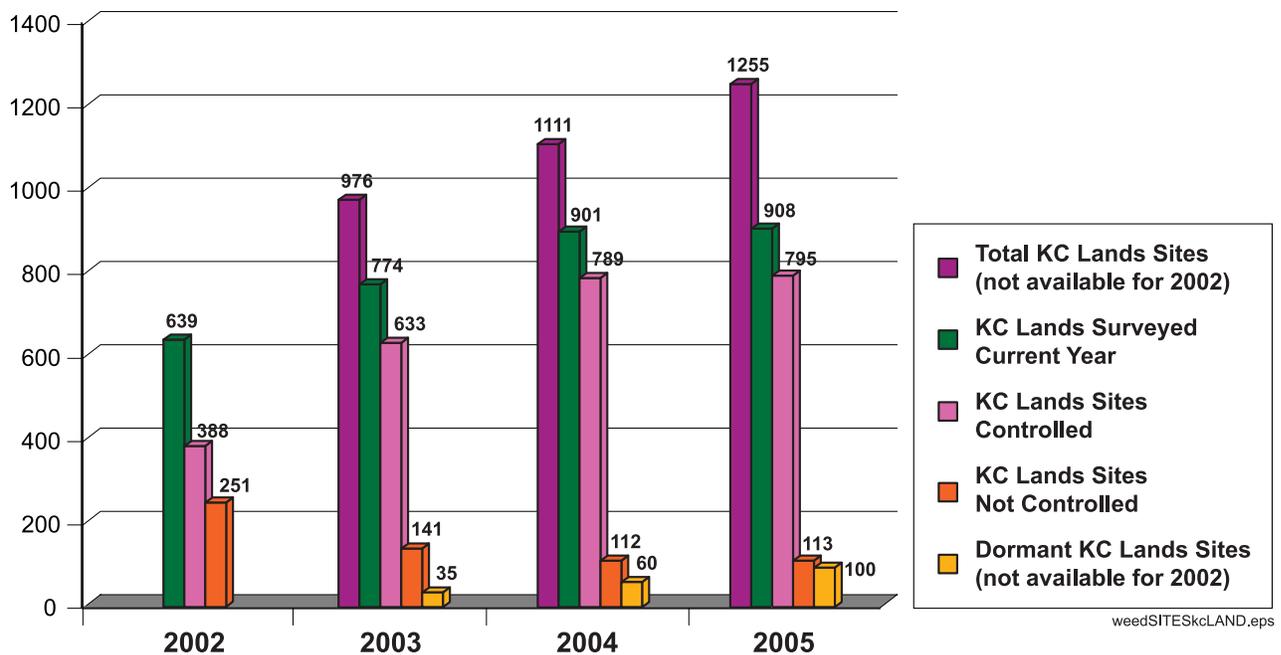
To increase the ability of land managers responsible for controlling noxious weeds in difficult-to-access areas, the KCNWCP paid for personnel within the Parks Division to receive pesticide training and licensing. This expenditure resulted in an increase in Parks' ability and commitment to effectively control several invasive aquatic plants (purple loosestrife, garden loosestrife and knotweed) in riparian areas.

### **2005 County Lands Highlights**

- There were 20 noxious weed complaints on county-managed lands. This was up from 11 complaints logged in 2004 and 12 complaints logged in 2003. The majority of complaints were for noxious weeds on road ROW, one in a stormwater retention pond and one on open space land. All complaints were checked within a week and were controlled by the responsible land managers or by the county lands weed specialist. All complaint areas were controlled prior to seed production.
- In total, 908 county-managed parcel and road noxious weed sites were surveyed during 2005. Of these surveyed sites, 795 sites (88%) were controlled up from 789 sites (88%) in 2004, 633 sites (82%) in 2003 and 388 (61%) in 2002 (Figure 5).

- A total of 447 unincorporated county roads were surveyed in 2005. An additional 72 roads were surveyed in incorporated areas that contract with King County Roads Maintenance. Surveys for noxious weeds on county roads documented 709 sites. Control was achieved on 88% (626) of these infestations.
- While conducting road surveys, a class B noxious weed previously not known to occur in King County was discovered. Mouseear hawkweed (*Hieracium pilosella*) was found on road ROW and adjoining private property near the Auburn area. Through a cooperative control effort by the private property owner and county roads crew excellent control was achieved. Rapid response and control of pioneering weed infestations such as this has the greatest chance for successful eradication.
- There are 79 known noxious weed infestations in storm water retention ponds documented in the program's database. Seventy sites were surveyed and control was achieved on 90% (63) of the sites. Control of the other five sites was not obtained due to being new sites found late in the year after the weeds had already gone to seed.
- During the 2005 season 199 county managed parcels were also surveyed for noxious weeds. These parcels included areas managed by King County Parks, Resource Lands, and Stormwater Services. Control was achieved on 85% of these sites. Many of these areas included difficult to control weeds growing in hard to access areas

**Figure 5: Number of Noxious Weed Sites on King County Lands 2002-2005**



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## Aquatic Areas

The invasion of noxious weeds in aquatic critical areas is a major source of degradation and habitat loss for a number of important wildlife species, including the endangered Puget Sound salmonids. The program's seasonal staff along with full-time staff surveyed and performed a range of weed control activities in aquatic critical areas during 2005. Aquatic noxious weed control activities in aquatic critical areas are shown in Table 5.

The control of aquatic and riparian infestations usually involves a high level of coordination, and often cooperation, between multiple landowners and jurisdictions. Education and outreach is particularly important in the first few seasons after the discovery of an aquatic weed infestation in order to develop a community understanding of the problem and an agreed-upon community standard of weed control. After this is achieved, the program then facilitates a coordinated community-wide control strategy to address the identified weed problem. This is the approach being applied to King County's small lakes, which are being systematically surveyed in an effort to protect both the individual resources as well as the lake ecosystems as a whole.

Overall, 79% of the recorded noxious weed infestation sites and 76% of the recorded area of noxious weeds in aquatic critical areas were controlled in 2005 (Table 5). These results show that there was a decrease in the number of sites controlled and an increase of the area controlled from 2004. The decrease in the number of sites controlled represents the loss of the dedicated staff position focusing on these areas. The increase in the area controlled is due to focusing control on a smaller number of larger infestations.

The program places a high priority on the early detection of pioneering infestations and responding rapidly to achieve control and eradication as efficiently as possible. This strategy is especially important with aquatic noxious weeds. A noxious weed infestation's size, impacts, and cost to control can increase exponentially in a short period of time and this effect is magnified for aquatic noxious weeds. Rapid response and control of aquatic noxious weeds continued to be a focus during 2005. Two examples follow:

- A rapid response control program for Brazilian elodea (*Egeria densa*) in Dolloff lake initiated in 2004 was continued during 2005.
- A pioneering infestation of water primrose in a county property previously thought to be *Ludwigia hexapetala* during 2004, was positively identified by Washington

Department of Ecology and an aquatic plant specialist with the Missouri Botanical Gardens as *Ludwigia peploides*. This noxious weed is new to Washington and has the ability to severely impact aquatic areas. Due to its invasiveness and its presence in only one site in the state, the KCNWCP requested the State to include this species as a Class A noxious weed. The State Noxious Weed Board agreed and placed this species on the 2005 weed list. Program staff treated the infestation for the second year with an EPA-approved aquatic herbicide formulation and surfactant. Only 11% of the infestation returned after the 2004 treatment and it is hoped that this infestation will be eradicated in the near future.

**Other 2005 Highlights:**

- KCNWCP continued to foster cooperative working relationships with other county programs. Partnerships included work with the Lake Stewardship Program on aquatic weed control Pipe Lake/Lake Lucerne and on Spring Lake.
- Provided technical support to King County Parks for controlling purple loosestrife and garden loosestrife on several Parks’ managed properties. Also funded pesticide training and licensing for 10 Parks personnel. KCNWCP staff also assisted Parks personnel in controlling purple loosestrife.
- For the first time, in cooperation between private business and property owners, 100% of the garden loosestrife (*Lysimachia vulgaris*) infestations found at Rutherford Slough was controlled. This large infestation next to the Snoqualmie River poses a significant threat to the Snoqualmie River watershed aquatic habitat.

**Table 5: Aquatic Critical Area Weed Control in 2005**

<b>Aquatic Weed</b>	<b>Number of Sites</b>	<b>Area Found (sq ft)</b>	<b>% Sites Controlled</b>	<b>% Area Controlled</b>
Brazilian Elodea	2	2330	100%	100%
Common Reed	17	203,890	24%	2%
Garden Loosestrife	78	447,047	86%	91%
Hairy Willowherb	2	20,020	100%	100%
Parrotfeather	1	0	100%	100%
Policeman’s Helmet	161	792,771	77%	83%
Purple Loosestrife	470	698,795	80%	81%
Water Primrose	2	575	50%	87%
<b>Total</b>	<b>733</b>	<b>2,165,428</b>	<b>79%</b>	<b>76%</b>

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- Surveys on 14 lake systems: (Spring, Pipe, Lucerne, Cottage, Dolloff, Moss, Burien, Borst, Joy, Spring, Killarney, Brook, Yellow, Bellevue).
  - Surveys on 16 creeks or river segments: (Longfellow, Miller, Thornton, Kelsey, Issaquah, Green, Cross Landing, Daniels, Des Moines, Laughing Jacobs, Ober, Sammamish, Slaughters, Taylor, Walker, Wallace Swamp).
  - Surveys on 10 wetland systems: (Rutherford Slough, Bassett Pond, Heyer Point Park (KVI beach), Robinson Point Park, Dumas Bay, Peasley Canyon, Poverty Bay/Lakota, Foster Island/Marsh Park, Tracy Owen Park, Swamp Creek Park).



**Program staff conducted weed surveys on 14 lake systems including Lake Dolloff (below).**



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## State and Federal Lands

The State of Washington and the Federal Government are among the largest landholders in King County with over 3,700 parcels comprising 38% of the total area within King County. The State and Federal Lands Noxious Weed Specialist is responsible for coordinating and improving noxious weed control on publicly managed lands including state highways, parks, conservation areas, resource lands, and ports of entry.

### Washington State Department of Transportation (WSDOT)

An annual survey of 18 state routes and interstate highways was conducted covering 660 total miles (330 linear miles). In 2005, 839 priority noxious weed infested sites were observed along roadsides; and 555 (67%) of these sites were controlled. The accumulation of 118 new noxious weed sites and the late season proliferation of tansy ragwort decreased the percentage controlled by 7% from 2004. However, the number of controlled sites increased by 159 in 2005. Over the last four years, WSDOT has averaged 70% control of priority noxious weed sites along its roadsides. The results have been summarized in the Table 6.

In addition to roadside weed control, WSDOT staff participated in weed control projects in wetlands and riparian areas along Mill Creek near Auburn in a collaborative project with KCNWCP staff and the City of Auburn as well as Miller Creek near City of Burien. These projects resulted in excellent weed control, improved inter-agency relationships, and delineated property boundaries for future reference. The weed control along Miller Creek was an important component in a watershed-scale project to prevent the movement of noxious weeds downstream where restoration efforts are underway.

**Table 6: Washington State Department of Transportation Sites**

<b>WSDOT Sites 2002-2005</b>				
Year	New Sites	Infested Sites	Controlled Sites	Percent Controlled
2005	118	839	555	67%
2004	87	540	396	74%
2003	88	819	589	72%
2002	100	701	472	67%

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## **Washington Department of Fish and Wildlife (WDFW)**

In 2005, 24 surveys were conducted at WDFW boat launches and 100% of the weeds found were controlled. Program staff assisted WDFW staff in the control of purple loosestrife at Panther Lake, North Lake, Lake Desire, and along the Snoqualmie River south of Carnation.

## **Washington State Parks**

A joint effort between KCNWCP, King County Parks, and Washington State Parks resulted in comprehensive treatment of 30,000 square feet of combined purple and garden loosestrife at Lake Sammamish State Park. The second year of treatment for invasive knotweed at Flaming Geyser State Park and portions of Auburn Narrows was completed. Survey and control of noxious weed infestations at Saltwater State Park, State Parks Headquarters in Auburn and Iron Horse Trail were also completed in 2005.

## **Washington State Department of Natural Resources (WDNR)**

WDNR staff completed the second year of treatment of a 3-acre infestation of yellow hawkweed along Maple Valley-Black Diamond Rd (SR-169).

## **Port of Seattle**

In 2004 and 2005, KCNWCP staff surveyed and worked with Port of Seattle staff and consultants to develop a management plan for noxious weed control along Miller Creek

within the mitigation area for the expansion of the Seattle-Tacoma International Airport. In 2005, Port of Seattle began streambank restoration and controlled 100% of the combined 19,370 square feet of noxious weeds on site.



*Knotweed project manager Monica Walker inspects plants treated with special aquatic-safe herbicides to determine the effectiveness of the control at a site along the Green River.*

Program staff worked extensively with Port of Seattle landscape staff to control 48 noxious weed infestations on park lands along the Duwamish River, industrial sites adjacent to Sea-Tac Airport, and Tyee Valley Golf Course.

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## Geographic Information System (GIS) Technology

The collection and analysis of spatial data has been an invaluable tool for the ongoing control of noxious weeds. Program staff use ArcView GIS software to plan surveys, determine property ownership, map noxious weed infestations, identify problem areas, and visually communicate the impacts of noxious weeds to a variety of stakeholders.

Since 2004, program staff has collaborated with the King County GIS Center to post noxious weed geospatial data on King County's iMAP website, allowing users to view noxious weed distribution data in a web-based format for free. This web-based application can also be used to create and print maps at any scale selected by the user. The noxious weed data set (called

map set) is classified by four habitat categories: aquatic, urban, open space, and pasture/agriculture. The noxious weed iMAP map set is also linked to the noxious weed program website where the user can learn about the weeds during their mapping session. The noxious weed iMAP page can be found at:

**[http://www.metrokc.gov/gis/Mapportal/iMAP\\_main.htm](http://www.metrokc.gov/gis/Mapportal/iMAP_main.htm)**

Through the use of GIS and Global Positioning Systems (GPS) the program has improved the accuracy and efficiency of locating noxious weed sites throughout King County especially on roadsides, parks, forested lands and other sproperties where access is difficult or there are few landmarks. In 2005, 175 surveys were conducted utilizing GPS technology.

Noxious weed spatial data has been useful for program planning including revising seasonal specialist routes, tracking where new infestations have been detected and where known locations have become dormant after several years of control work. In 2005, an analysis of noxious weed infestations by sub-watershed basins was conducted to describe the distribution and impact of a number of weed species. The resulting maps for tansy ragwort, giant hogweed, purple loosestrife, and spotted knapweed have been included in Appendix D.



***Global Positioning System (GPS) technology is used by staff to record noxious weed locations.***

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## Planning and Coordination

Achieving sustainable, long-term reductions in weed impacts requires large-scale coordination of weed control effort. Weed control at the individual project or property level usually fails in the long run if neighboring infestations are not also treated and are allowed to provide a source for re-infestation. Program staff worked to achieve coordinated weed control in a number of ways:

- 1) Working with communities to develop community standards for weed control in a neighborhood. This involves a process of landowner contact and community outreach, aiming to raise awareness of the impacts of noxious weeds and to seek voluntary control of infestations. Where a high community standard of weed control is established, landowners with weed infestations clearly outside those standards may then be targeted for enforcement action under the regulatory compliance provisions of RCW 17.10.
- 2) Development and implementation of weed management plans through active participation of stakeholders. Specific weed management plans have been developed for the high priority Class A noxious weeds garlic mustard (*Alliaria petiolata*), milk thistle (*Silybum marianum*) and goatsrue (*Galega officinalis*). Work continued in 2005 on the development of a county-wide management plan for the Class B noxious weed tansy ragwort (*Senecio jacobaea*).

- 3) Participation in broader county planning and programming efforts regarding noxious weed issues, such as the development and implementation of the Water Resources Inventory Area (WRIA) plans and the Critical Areas Ordinance (CAO).

- 4) Development of Cooperative Weed Management Areas (CWMA). A CWMA refers to a local organization that integrates all noxious weed management resources on a large scale across jurisdictional boundaries in



**One of several large knotweed rhizomes removed during a control project on the Green River.**

order to benefit entire communities. The purpose is to facilitate cooperation and increase the efficiency and effectiveness of the weed control efforts of participants.

In addition to the implementation of the first CWMA project in King County in the Green Duwamish watershed, the program also participated in the initiation of additional CWMA's in the South Fork of the Skykomish watershed, the Middle Fork of the Snoqualmie River and in the Hylebos Creek watersheds.



*Noxious weed specialist Amy Yahnke tackles invasive knotweed using a specially designed knotweed herbicide injector gun as part of the Green River Watershed CWMA knotweed control project.*

Major operational activities were undertaken in two of these CWMA project areas, focusing on the noxious weed Japanese knotweed (*Polygonum cuspidatum*) and its hybrids, which are having a substantial impact on riparian ecosystems in the county :

- a) Green Duwamish CWMA. In cooperation with CWMA partners, the watershed was extensively surveyed for Japanese knotweed and its hybrids and an action plan was developed. This action plan defined high priority sites for control. Thirty-one sites were selected for treatment in 2005 in the Green/Duwamish watershed. Control was achieved on 30 of these sites.

These sites were treated with a variety of methods including stem injection, foliar application of the herbicide glyphosate and shading with geotextile fabric. In total, 8.96 net acres of invasive knotweed was treated in 2005 within 23.3 gross infested acres. This project was implemented with a grant of \$34,600 from the USDA Forest Service and \$10,000 from the Washington State Department of Agriculture.

- b) Skykomish CWMA. Using a similar strategy to the Green Duwamish CWMA, the watershed was surveyed for Japanese knotweed and its hybrids and an action plan developed. In total, 9.3 net acres of invasive knotweed was treated in 2005 within 21.2 gross infested acres. Treatment was either by stem injection or foliar application of the herbicide glyphosate. This project was implemented with a grant of \$10,000 from the USDA Forest Service.

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## Integrated Pest Management

Since its inception, the program has applied an Integrated Pest Management (IPM) approach to fulfill the requirements of the Washington State Noxious Weed Law, RCW 17.10, and the King County Executive order on Integrated Pest Management. Integrated Pest Management, as defined by RCW 17.15, is a coordinated decision-making process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner to meet pest management objectives. Table 7 summarizes the range of control techniques used by landholders on noxious weed infestations in 2005.

**Table 7: Comparison of 2005 Landholder Noxious Weed Control Methods (Percent of Infestation Sites where Control Method is Known)**

<b>Control Method</b>	<b>Parcel Sites</b>	<b>Road Sites</b>	<b>All Sites</b>
Biological	1%	0%	0%
Chemical	30%	58%	38%
Manual	51%	19%	42%
Mechanical (Mowing)	14%	12%	14%
Cultural	0%	1%	0%
Combination of Techniques	4%	10%	6%

Biological control is an important element in our IPM control strategy. This control method is used for controlling large weed populations often in difficult-to-access areas. One noxious weed in particular that fits into this category is purple loosestrife. Biological agents are also a good match for controlling noxious weeds that are pervasive in the county and are not selected for control due to their pervasiveness. If biological control agents successfully establish over time, the weed populations can be decreased to manageable levels. Some additional widespread noxious weeds for which biological controls have been released include tansy ragwort, Canada thistle, poison hemlock, Scotch broom and St. Johnswort.

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## 2005 Biological Control Highlights:

- Biocontrol projects begun in conjunction with Washington State University King County Extension in 2004 were continued in 2005. Projects included collecting and releasing suitable biological control agents. Additionally, a mapping project marking release locations with GPS coordinates was initiated.
- In 2005, there were two releases of *Galerucella* beetles at established purple loosestrife sites. Releases were conducted in May and August to better guarantee that a population of *Galerucella* would be present throughout the growing season.
- In May, 950 *Galerucella* beetles were released at Auburn Supermall and Marymoor park. During the August release, 3,200 *Galerucella* were released at Mercer Slough, Lake Forest Park, Sammamish Wilmot Gateway Park, Magnuson Park, Lake Desire and Auburn Supermall.
- During the 2005 season, a St. Johnswort site was selected for the release of *Chrysolina* beetles. A suitable location at Spring Lake Park was selected and 388 beetles were released. Additionally, surveys were conducted for suitable sites to release Canada thistle and bull thistle biological agents in 2006.



***Galerucella* beetles are released to help with the control of purple loosestrife, a Class B noxious weed.**



**Biological agents include the cinnabar caterpillar that helps control tansy ragwort plants.**

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## Conclusions

The public investment in noxious weed control by the King County Noxious Weed Control Program is creating significant public value for the citizens of King County. This is achieved by reducing impacts of noxious weeds on the environment, recreation, public health and economic resources of the county. Continued progress was made towards the operational goals of eradication of Class A noxious weeds and the control of designated Class B noxious weeds.

Engaging citizens as active participants in weed control activities through education and outreach lies at the foundation of the program's success. The program continues to achieve extremely high levels of voluntary compliance by landowners with noxious weed control responsibilities as required under the State Weed Law RCW 17.10. Citizen satisfaction regarding the program performance is high, with 72% of surveyed respondents giving the program an "A" grade.



**Noxious weed specialist Sean MacDougall removes a large phragmites plant during an Earth Day weed pull at Herrings House Park on the Duwamish River.**

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