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Attachment A

2007-362

Report, Evaluation and Recommendations  
of Noxious Weed Control by  
County Land Managers



*Garden loosestrife invading wetlands at Marymoor Park*

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**King County**  
Department of  
Natural Resources and Parks  
Water and Land Resources Division  
**Noxious Weed Control Program**

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## **Introduction**

This report is submitted in accordance with Proviso 1 in Section 72 of the 2007 King County Budget, Ordinance 15652, which requires that the executive submit a report on noxious weed control by county land managers. This report provides: 1) a summary list of county lands and the responsible land manager; 2) an evaluation of the land manager's effort to control noxious weeds with an emphasis on county lands with repeated infestations and 3) recommendations on how county land managers might better control noxious weeds.

## **Background**

A noxious weed is defined by state law (RCW 17.10) as a plant that when established is highly destructive, competitive, or difficult to control by cultural or chemical practices. Noxious weeds can severely impact agricultural production, reduce wildlife habitat and other environmental values, impair recreational use of open space and aquatic areas and pose public health risks.

Noxious weeds have generally been introduced to the region through human activities. They have been introduced into environments in which they did not evolve and they generally have few natural enemies to limit their reproduction and spread. Of the tens of thousands of introduced plant species, only a small fraction presents a sufficient threat to justify noxious weed status. The 2006 King County Noxious Weed List contains 118 plant species (Appendix 1). The purpose of the state noxious weed law is "to limit economic loss and adverse effects to Washington's agricultural, natural and human resources due to the presence and spread of noxious weeds on all terrestrial and aquatic areas in the state."

Noxious weeds are broken into three categories. Class A noxious weeds are not native to the state, are of limited distribution or are unrecorded in the state, and pose a serious threat to the state. Class B noxious weeds are not native to the state, are of limited distribution or are unrecorded in a region of the state, and pose a serious threat to that region. Class C noxious weeds are all other noxious weeds. RCW 17.10 requires all landowners to eradicate Class A noxious weeds. It also empowers the State and County Noxious Weed Board to require landowners to control Class B and Class C noxious weeds. The majority of Class B and some Class C noxious weeds are regulated in King County in this way. A complete list of the regulated and unregulated noxious weeds in King County is provided in Appendix 1.

As of 2006, a total of 11,774 regulated noxious weed infestations have been recorded in King County. Of these sites, 1,830 are Class A noxious weeds; 9,801 are Class B noxious weeds; and 143 are Class C noxious weeds. Far more extensive, but less well surveyed, are the unregulated noxious weeds, some of which are very widespread (such as Scotch broom, English ivy, reed canary grass, Canada thistle and Japanese knotweed).

King County's Noxious Weed Control Program (KCNWCP) works with all county agencies to minimize noxious weed impacts and ensure that control obligations are met under the State Weed Law. County land managers are required to meet the same standards of weed control as those applied to private lands. KCNWCP staff systematically survey all of King County, including county owned lands, to identify noxious weed infestations on an annual basis. Small infestations are immediately controlled by program staff at the time of survey. Larger

infestations are referred to the property owner – including county land managers – for control. Once controlled, infestations are monitored to ensure weed control was effective. Education, training, planning, regulatory and technical support services are also provided.

### **County Lands—A Summary**

King County manages an extensive network of public lands consisting of approximately 4,000 parcels. These total 32,100 acres, or 2 percent of the land area in the county. These lands include transit, wastewater and solid waste facilities, as well as parks, trails, open space, and stormwater retention ponds. The county also owns or manages approximately 1,800 linear miles of roads and rights-of-way (ROW). As a land owner, King County is responsible for controlling the regulated noxious weeds found on its property.

County lands vary greatly in area, condition and land use and are managed by a range of county agencies. The major agencies are: Department of Transportation (Road Services Division and Metro Transit Division), Department of Natural Resources and Parks (Parks and Recreation Division, Water and Land Resources Division, Solid Waste Division and Wastewater Division) and the Department of Executive Services (Facilities Management Division). A summary and description of the county lands for each county land manager is provided in Table 1. The detailed parcel listing of these county lands used to derive this summary is an extremely large document and is available on request.

A number of county agencies are also actively purchasing lands to add to the county's inventory, while a smaller area of land is being divested. Major changes in 2006 included acquiring 899 acres of Natural Resource Lands, while 136 acres of King County Parks were transferred through annexation.

Table 1: Summary of County Lands and Level of Infestation with Noxious Weeds

Division Name	Number of Parcels	Area of Land Management (Acres)	% of Area Infested with Regulated Noxious Weeds	% of Area with High Noxious Weed Density (Regulated & Unregulated)	% of Area with Medium Noxious Weed Density (Regulated & Unregulated)	% of Area with Zero or Low Noxious Weed Density (Regulated & Unregulated)	Noxious Weed Control Expenditures
Parks and Recreation Division	711	15629	0.02%	2.45%	19.59%	77.96%	\$62,091
Road Services Division (Parcels only)	229	1,392	0.08%	0.60%	17.20%	82.2	\$100,368 Includes control on ROW
Road Services Division (ROW's)	736	4364 (Estimated)	0.14% (Estimated)	No data	No data	No data	Included above
Water & Land Resources Division Natural Resource Lands	530	9478	0.11%	5.32%	8.04%	86.64%	\$39,476
Water & Land Resources Division Storm Water Services	790	267	2.54% Based on averaged data from KCNWCP	No data	No data	No data	\$63,999
Water & Land Resources Division River and Floodplain Management	94	505	0.42% Based on averaged data from KCNWCP	0.00%	2.20%	97.80%	\$1,272
Wastewater Treatment	59	299	0.26% Based on averaged data from KCNWCP	1.52%	0.78%	97.69%	\$55,440
Solid Waste	13	1,389	0.31% Based on averaged data from KCNWCP	8.31%	11.81%	79.88%	\$5,244
Metro Transit	53	301	0.07%	36.36%	7.52%	56.11%	\$80,562.
Facilities Management	340	1,068	0.14% Based on averaged data from KCNWCP	0.01% Based on KCNWCP data only	0.07% Based on KCNWCP data only	99.92% Based on KCNWCP data only	\$1,416

## Noxious Weeds on County Lands

A wide variety of noxious weeds infest county lands. These weeds are broadly representative of the weeds that occur in the non-urban parts of the county. There are 966 known infestation sites of regulated noxious weeds on county lands or about 8.2 percent of the total number of sites in the county. A breakdown of the major weeds of county lands is given in Table 2. In general, the areas of unregulated noxious weeds (those not required to be controlled by law) are far more extensive than the area of regulated noxious weeds.

Table 2: The Most Common Noxious Weeds on County Lands—A Summary

Division	Regulated Noxious Weeds	Non-Regulated Noxious Weeds
Road Services Division—parcels only	Tansy ragwort, Purple loosestrife, spotted Knapweed, Sulfur cinquefoil, Orange hawkweed	St Johnswort, Common tansy, Scotch broom, Reed canary grass
Road Services Division—ROWs	Tansy ragwort, Spotted knapweed, Orange hawkweed, Yellow hawkweed, Smooth hawkweed, Purple loosestrife, Sulfur cinquefoil, Goatsrue, Meadow knapweed	St Johnswort, Common tansy, Scotch broom, Reed canary grass, Canada thistle, Bull thistle, Common groundsel, Knotweed, Butterfly bush
Parks and Recreation Division	Tansy ragwort, Purple loosestrife, Garden loosestrife, Spotted knapweed, Sulfur cinquefoil	English ivy, Reed canary grass, Herb Robert, Scotch broom, Common tansy, Canada thistle, St. Johnswort, Knotweed
Water & Land Resources Division—Natural Resource Lands	Tansy ragwort, Purple loosestrife, Spotted knapweed	English ivy, butterfly bush, reed canary grass, Canada thistle, bull thistle, Scotch broom, herb Robert, common tansy, St Johnswort
Water & Land Resources Division—Drainage	Tansy ragwort, Purple loosestrife, Sulfur cinquefoil, Perennial sowthistle	Butterfly bush, St Johnswort, Reed Canary grass, Canada thistle, Bull thistle, Scotch broom
Water & Land Resources Division—River and Floodplain Management	Tansy ragwort, Purple loosestrife, Garden loosestrife	Scotch broom, Butterfly bush, Reed canary grass, Knotweed, Canada thistle, English ivy
Solid Waste	Tansy ragwort, Spotted knapweed, Orange hawkweed	Scotch broom, Common tansy, St Johnswort, Knotweed, Butterfly bush, English ivy
Wastewater Treatment	Purple loosestrife, Garden loosestrife, Tansy ragwort, Policeman's helmet	English ivy, Knotweed, Scotch broom, Reed canary grass, Canada thistle, Bull thistle, Poison hemlock
Facilities Management	Giant hogweed, Meadow knapweed, Tansy ragwort (Based on KCNWCP data only)	Knotweed, English ivy, Scotch broom,
Metro Transit	Tansy ragwort, Purple loosestrife, Dalmatian toadflax	English ivy, Scotch broom, St Johnswort, Canada thistle, Bull thistle

## **Evaluation of County Land Manager Effort**

The objectives of noxious weeds control (as defined by the State Noxious Weed Law RCW 17.10 and elaborated on by the King County Noxious Weed Control Program Strategy) are to minimize the impacts of noxious weeds by: 1) eradicating existing infestations and preventing new infestations of Class A noxious weeds, 2) controlling Class B and other regulated noxious weeds to below levels of significant impact, and 3) increasing land manager and citizen engagement and participation in general noxious weeds control.

This report evaluates the effectiveness and efficiency of each county land manager in achieving these noxious weed control objectives. Effectiveness of noxious weed control was evaluated by comparing key performance measures with benchmark levels of other county and non-county land managers. Where significant variations from these benchmarks occurred, the reasons for these were analyzed and discussed. The level of input resources utilized by land managers to achieve these performance measures was then considered to analyze the efficiency of this effort. There is considerable variation in the approach land managers take to control noxious weeds due to the nature of the agencies and the lands they maintain. As a result, there is variation in the effectiveness and efficiency of weed control achieved.

A small number of Class A noxious weeds are known to occur on county lands. County land managers respond very effectively to Class A noxious weed infestations. Only 13 Class A infestations have ever been recorded on county lands and these infestations have been either eradicated or are actively managed with this objective.

Overall, the level of control of regulated noxious weeds (weeds that the landowner is legally required to control) on county managed lands slightly exceeds the level of control by non-county land managers (Figure 1). Control of a noxious weed infestation is defined as the elimination of seeding and prevention of spread. In 2006, 89 percent of the 966 known regulated noxious weed sites on county lands were controlled. The percentage of regulated noxious weeds sites controlled in 2006 by each management agency is shown in Table 3. There is a trend over time of generally increasing levels of control for regulated weeds for both county lands and all other lands. Despite this, there are still occurrences where county lands have uncontrolled regulated noxious weeds, while nearby private lands have achieved high levels of noxious weed control. This scenario commonly is a source of citizen concerns and complaints (Appendix B).

The improving trend in the control of regulated noxious weeds on county lands is a direct outcome of a King County Council proviso in the 2002 Adopted Budget, which resulted in the hiring of a dedicated County Lands Noxious Weed Specialist to focus on weed control on county lands. This staff member surveys county owned lands and works with county land managers to achieve control. He also responds to, investigates, tracks and resolves noxious weed complaints.



Figure 1: Control of Noxious Weeds—County, Non-County Lands Comparison

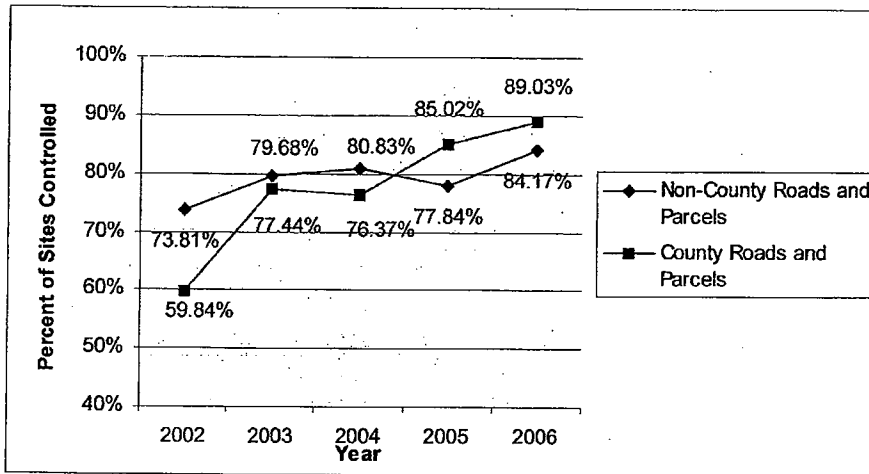


Table 3: Control of Regulated Noxious Weed Sites by the Land Managers in 2006

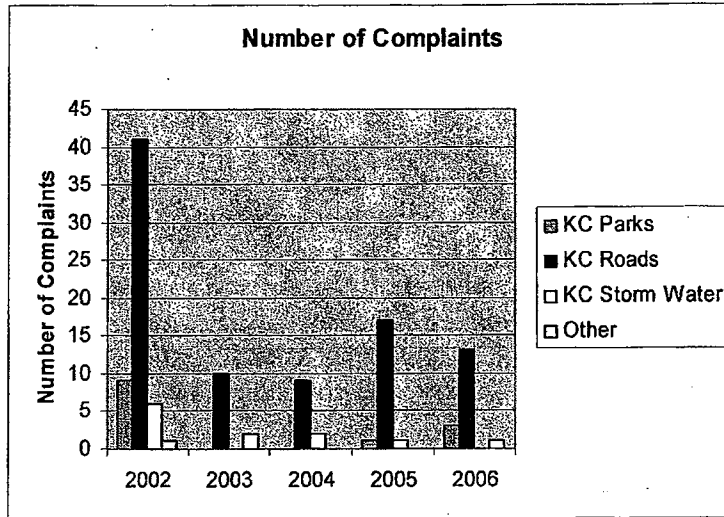
Division	Number surveyed	Number Controlled	Percent Sites Controlled
King County - Stormwater Services	88	81	92.05%
King County - River and Floodplain Mgmt	7	6	85.71%
King County - Parks & Natural Resource Lands	71	46	64.79%
King County Facilities Management	4	3	75.00%
King County Road Parcels	17	14	82.35%
King County Road ROW	738	683	92.55%
King County Solid Waste Division	2	2	100.00%

County lands also contain extensive infestations of unregulated noxious weeds. The relative extent of these infestations is described in Table 1. The major areas of these infestations are in King County Parks and Natural Resource Lands. These are infestations of Class B and Class C noxious weeds that are not designated for control in King County and, therefore, landowners are not required to control them.

#### ***County Lands Citizen Complaints and Concerns***

Citizen complaints about noxious weed control have remained reasonably constant in recent years (Figure 2), after a significant decline in 2003 due to the efforts of the full-time County lands noxious weed specialist. In 2006, for example, 17 complaints were received relating to all 32,100 acres of county-owned land. The majority of complaints are on King County roads rights-of-way. Occasional complaints are received about Natural Resource Lands, parks and stormwater retention ponds. In addition, the King County Noxious Weed Control Program annually surveys citizens for feedback about program activities and effectiveness. Citizen concerns about the quality of noxious weed control on county lands and the discrepancy between this and the control of private lands is commonly received as part of this feedback (Appendix B).

Figure 2: Citizen County Lands Noxious Weed Complaints for 2002-2006



***Parks and Recreation Division***

Parks and Recreation Division is the biggest land manager in the county. The division is directly responsible for 15,629 acres of land in two management categories: active recreation (supporting ball fields, organized recreation activity and regional trail systems) and multi-use sites (supporting active and passive recreation with less intensely developed facilities and natural areas.) In addition, Parks and Recreation staff implement maintenance activities for 9,478 acres of ecological lands and working resource lands that are under the policy and custodial responsibility of the Natural Resource Lands Program of the Water and Land Resources Division (these lands are generally referred to as Natural Resource Lands). The King County Open Space System Plan describes overall policies for all Parks and Natural Resource Lands sites.

The Parks and Recreation Division is responsible for a large proportion of county lands vulnerable to noxious weed impacts to environmental and recreation values. Many of the lands were acquired by general obligation bonds in the late twentieth century. The noxious weeds present reflect both the historic distribution of weeds at the time of the acquisition and the subsequent weed management by the Parks and Recreation Division.

The Parks and Recreation Division noxious weed control budget is extremely small in relation to the area of land managed and the extent of noxious weeds infesting this land. The 2006 total noxious weed control expenditure was \$62,091 for both active recreation and multi-use sites. In addition, Parks and Recreation spent \$39,476 on noxious weed control on Natural Resource Lands that are under the policy and custodial responsibility of the Water and Land Resources Division, Natural Resource Lands Program. Additional valuable noxious weed control activities are undertaken by volunteer labor forces through the Adopt-a-Park, Park Ambassador and other volunteer-based programs. Roughly 3,800 hours of volunteer weed control was provided in 2006 for Parks and Natural Resource Lands. This effort is valued at approximately \$50,000.

In general, noxious weed control is not explicitly budgeted, but is a discretionary part of the general parks maintenance budget. The Parks and Recreation Division noxious weed control budget is similar in total size to other county land management agencies responsible for far smaller land areas and with less significant weed burdens.

The Parks and Recreation Division is achieving variable levels of control of regulated noxious weeds. The overall level of compliance for the control of regulated noxious weeds is lower than the general standards achieved by other agencies in the county. This is partly a result of the low level of resources available for the extensive areas of land. In addition, many of these infestations are difficult to access and control, especially in sensitive riparian and aquatic areas. There is scope for improved performance by the division regarding the control of regulated noxious weeds. Response to complaints and notifications from KCNWCP is usually good. The efficiency with which they respond given their low level of resources per acre managed is high.

A number of Parks and Recreation Division managed sites have had a history of repeat infestations. Nine sites have had recorded repeated infestations of regulated noxious weeds, ranging from five to 11 years in duration. The site with the longest history—11 years—of infestation is the Burke Gilman Trail. It has been especially challenging to control noxious weeds on the trail given its size and heavy use by the public.

It is apparent that Parks and Recreation Division managed lands are extensively infested with unregulated noxious weeds. On average, 2.5 percent of King County parks have a high noxious weed density and 19.6 percent a medium density. In addition, 5.3 percent of Natural Resource Lands have a high noxious weed density and 8.0 percent a medium density. The management of unregulated noxious weeds is generally given a low priority by Parks and Recreation Division. The overall level of resources applied to control these extensive infestations of unregulated noxious weeds is extremely small in relation to the scale of the problem. This level of infestation significantly impairs the environmental and recreational use values of these infested lands.

### ***Road Services Division***

Roads Services Division (RSD) is responsible for the maintenance of county roads in unincorporated King County. They also maintain roads on a contract basis for the cities of Burien, Covington, Kenmore, Lake Forest Park, Maple Valley, Newcastle, Sammamish, SeaTac, Shoreline, and Woodinville. RSD is responsible for maintaining 1,800 linear miles of rights-of-way (ROW), as well as managing approximately 1,390 acres of other property. These properties include easements, mitigation sites, stormwater ponds, gravel pits and maintenance facilities.

Noxious weed control on roadsides is undertaken by the Vegetation Management Program, which resulted from a 2006 internal re-organization to better address the division's vegetation management needs. Regulated noxious weeds are specifically targeted for control as part of this process. Unregulated noxious weeds are controlled less comprehensively on a complaint basis and as required as part of the general roadside maintenance activities.

King County roadsides are extensively infested with noxious weeds due the high degree of disturbance found on these sites and the significant movement of weed seeds along these corridors. The 755 regulated noxious weed sites on RSD maintained lands constitute 76 percent of the total number of regulated noxious weed infestation sites on King County lands. Due to the significant levels of infestation and the high visibility of these sites, weeds on county roads also constitute the largest proportion of noxious weed control complaints received (Figure 2).

In 2006, there were approximately six acres of regulated noxious weeds spread over 738 sites on RSD managed ROW and 17 infestation sites, totaling an estimated 18.3 acres of regulated weeds on RSD managed parcels. Overall, 92 percent of these ROW infestations and 82.4 percent of the known parcel infestations were effectively controlled in 2006 before seed production and spread.

RSD does not have a comprehensive inventory of the total (regulated and unregulated) noxious weed coverage on their property and ROW areas. Based on the RSD parcels, it is estimated that 0.6 percent of RSD land has a high total noxious weed density and 17.2 percent has a medium density. Noxious weed densities for ROWs are not known, but it is estimated that regulated noxious weed infestations cover 0.14 percent of ROWs (Table 1).

Some of the RSD lands have a history of repeat infestations. This is partly due to nature of roadside weed management. Many roads extend for long distances and weeds (often the same species) can be controlled in certain areas of the road, only to reappear farther down the ROW. Also, roadsides are some of the most disturbed sites in the county and are prone to invasion of noxious weeds from surrounding areas or from seeds transported by vehicles.

Even though RSD achieves a high level of regulated noxious weed control, its performance still results in community concern. The large number of infestations on county roads results in significant numbers of uncontrolled infestations, despite the high rates of control being achieved. On several occasions, response to requests to control regulated noxious weeds has been insufficient. Flowering and seeding noxious weeds adjacent to private lands have been a significant source of landowner complaint (Figure 2). As a result, the King County Noxious Weed Control Program has issued four Notices of Violation to the Roads Maintenance Section between 2004 and 2006. All violations were subsequently resolved.

The effectiveness of control by RSD of regulated noxious weeds is generally very high (92.5% on roads and 82.35% on parcels). This has been achieved despite significant challenges facing the division such as the pernicious nature of weeds along roadways and the fact that noxious weed control competes with safety and maintenance responsibilities. For example, in 2006 there were three federally declared weather disasters in King County, requiring vegetation staff to prioritize danger tree removal, slope stabilization, and other emergency activities.

Nonetheless, there are areas for improvement. For the last several years, late assignments have led to late starts for controlling noxious weeds. These delays have allowed noxious weeds to flower and become highly noticeable to surrounding property owners and those traveling in the area, prompting complaints (see Appendix B).

The persistence of regulated noxious weeds on some RSD managed lands also reflects the use of some inefficient weed control strategies. The efficiency with which roads maintenance crews undertake noxious weed control may be improved in the following ways:

1) Upgrading weed control equipment. RSD has access to only one computerized herbicide application truck to cover the entire county (by comparison, Washington State Department of Transportation has three of these vehicles that operate in King County on a much shorter length of road). The RSD is currently evaluating renting an additional herbicide application truck for use during the three to four month high demand season. Sprayer trucks are used for large infestations. For control of small infestations of regulated noxious weeds, RSD uses 150 and 300 gallon battery powered spray pumps, in addition to hand-held sprayers.

2) Improved coordination between mowing and spraying operations. For most of the perennial and biannual noxious weeds, mowing alone will not provide acceptable control for the season. There are still enough energy reserves in the roots to flower and seed again in the same season. If noxious weeds are mowed, the land manager will either need to plan for continued mowing throughout the season or return a couple of weeks afterward to spray with a suitable herbicide. A two-week wait is usually necessary to provide enough leaf area for the herbicide to work properly.

Additionally, if noxious weeds have been sprayed, mowing operations cannot take place until the sprayed vegetation has died and turned brown. Mowing too soon after an herbicide application may not allow sufficient time for the herbicide to be translocated to the roots.

Overall, the level of noxious weed control resources is small in relation to the areas managed and the level of infestation when compared to other similar agencies. The total expenditure for noxious weed control on RSD managed lands was \$100,368 in 2006. Additional strains are placed on RSD's budget by the need to continually return to many of the noxious weed sites year after year. This is inherent when managing weeds on roadsides due to high levels of disturbance and the influx of weed seeds.

#### ***Water and Land Resources Division***

Water and Land Resource Division (WLRD) is the second largest land manager in King County. Programs within WLRD with land management responsibilities include Natural Resource Lands (NRL) with 9478 acres, Stormwater Services with 267 acres and River and Floodplain Management Program with 505 acres. Total area managed by WLRD is approximately 10,249 acres. Managed parcels include open space areas, natural areas, storm water ponds and flood buyout properties. WLRD through its NRL program is adding more

property into county ownership than any other division. During 2005, the area of land in the NRL inventory increased by 899 acres or 10.5 % through acquisitions and donations.

#### *1) Natural Resource Lands*

These lands, under policy and custodial responsibility of WLRD, are maintained by the Parks and Recreation Division. Evaluation of noxious weed control effectiveness and efficiency on these lands has, therefore, been included in the Parks and Recreation evaluation. In summary, regulated weeds on NRL are managed to a variable standard and generally below the benchmark levels of control set by other land managers. In addition, there are insufficient resources directed towards the control of unregulated noxious weeds. As a result, there exists a large backlog of control work for managing the unregulated noxious weeds and other invasive vegetation infesting these lands.

The KCNWCP has particular concerns about the ability of the county to control noxious weeds in new acquisitions of NRL Lands. Despite some provision for maintenance in the 2004 Parks Levy, funding is generally insufficient to provide for the increased maintenance requirements of this growing land inventory. As a consequence, maintenance funding on a per acre basis is decreasing. The ability of land managers to control the regulated noxious weeds is increasingly stretched and often minimal resources are available to control unregulated noxious weeds on new acquisitions. Another concern is the capacity to increase volunteer numbers and effort to assist controlling noxious weeds in new NRL acquisitions.

#### *2) Stormwater Services*

Stormwater Services (SWS) is responsible for the maintenance of 267 acres. Many of their 790 parcels do not exceed an acre in size. The parcels are primarily storage areas for stormwater runoff and are located in residential areas with high visibility. Most unregulated noxious weed control is done during general maintenance (mowing) of the facilities, which is contracted through RSD. All maintenance on these facilities is contracted out as there is no staff available to conduct any needed vegetation control. Until 2006, these facilities were on a twice per year mowing rotation. During 2006, the mowing rotation was cut back to a single site visit per year. For regulated noxious weed control initiated through contact by the Noxious Weed Control Program, SWS contracts with Department of Corrections or RSD.

SWS does not have a complete inventory of all noxious weeds (regulated and unregulated) on its lands. However, the SWS noxious weed control budget appears adequate in relation to the area of land managed and extent of noxious weed infestation. Unlike most county land managers, noxious weed control is specifically identified and tracked as part of the general SWS maintenance budget. Currently, SWS is achieving acceptable control of the regulated noxious weeds. The level of compliance for the control of regulated noxious weeds broadly matches the general standards achieved in the county. Response to complaints and notifications from KCNWCP is good. The efficiency with which they achieve noxious weed control is good. In some instances, response time of required noxious weed control has been slow. This is usually associated with a delayed response of their contractor.

### *3) River and Floodplain Management Program*

Presently the River and Floodplain Management Program (RFMP) has a small number of parcels with management responsibilities. Many of these parcels were brought into their inventory as flood mitigation projects or buyouts of flood-prone residences and turned into open spaces. The process of removing structures brings intensive site disturbance, exposing the area to noxious weed invasion. This exposure is mitigated by incorporating native plantings after any structure is removed. But until the plantings become established, there is a significant need for maintenance.

RFMP is responsible for maintaining 505 acres of property. The area of known regulated noxious weeds is low. Overall, there are virtually no areas with high noxious weed density and 2 percent with medium weed density. RFMP has mostly low densities of unregulated noxious weeds.

Currently, RFMP efficiency is adequate for controlling their regulated noxious weeds. Because RFMP does not have vegetation maintenance staff available for controlling their noxious weeds, it depends on contractors to supply noxious weed control when needed.

There is a possibility that noxious weed control needs may increase with any potential increase of property acquisitions as a result of the new adopted flood plan. Also disturbances created during levee repair can lead to new noxious weed infestations.

Weed control responsiveness by the RFMP is generally good. At times, control work is slow to be implemented because of restricted availability of contractors (typically RSD) to do the work. With limited contractor availability, timely noxious weed control suffers.

### *Wastewater Treatment Division*

Wastewater Treatment Division (WTD) manages approximately 299 acres in the county. Most parcels are small in size (under an acre) and usually contain pumping apparatus. Treatment plants are on the larger parcels.

WTD's budget for regulated noxious weed control and unregulated weed control is adequate for their land ownership and the division is able to achieve the requirements for noxious weed control, as well as control of other unregulated noxious weeds. Much of WTD's maintenance responsibilities involve manicured planting areas that contain regulated and unregulated noxious weeds; these are controlled as part of routine landscape duties.

On average, approximately 1.5 percent of WTD property has a high noxious weed density and 0.8 percent has a medium weed density. The combination of dedicated property management staff and sufficient budget produce low noxious weed infestations.

### *Solid Waste Division*

Solid Waste Division (SWD) has only a small number of parcels in their inventory, with the Cedar Hills Landfill as their largest holding. The remaining parcels they manage are made up of transfer station sites or closed landfill operations.

SWD sites are moderately infested with noxious weeds. On average, 8.3 percent of SWD property has a high noxious weed density and 11.8 percent of the properties have a medium noxious weed density.

Generally, SWD has sufficient budget for controlling the amount of regulated noxious weeds infesting their managed parcels. Prior to 2006, their responsiveness to controlling regulated noxious weeds on closed landfills has been slow at times. This was due to staffing and equipment issues at Cedar Hills and closed custodial landfill sites. Typically, regulated noxious weeds were controlled using manual and mechanical control methods. As a result of SWD heightened awareness of noxious weed infestations, SWD commenced implementation in 2006 of a more aggressive weed control approach. This included the procurement of new mechanical control equipment and more widespread use of manual and spot spraying weed control methods. Continuing this approach and the wider adoption of KCNWCP Best Management Practices will further improve control results for regulated weeds. Non-regulated noxious weeds are, however, not generally targeted for control and therefore, these infestations will persist under the current approach.

#### ***Metro Transit Division***

Metro Transit Division (MTD) also has a small number of parcels to manage as well as one of the smallest land areas to manage. Management responsibilities include parcels used for transit bases, park and ride lots, trolley overhead substations and transit centers. Much of MTD's maintenance responsibilities involve manicured planting areas. Regulated and unregulated noxious weeds are controlled as part of their landscape duties.

MTD parcels are extensively infested with noxious weeds. Approximately 36.4 percent of their property has high densities of noxious weeds and 7.5 percent has a medium density of noxious weeds. The high density is due to the English ivy that was planted during the construction of many facilities in the late 1970s and early 1980s. MTD, however, provides sufficient budget for the amount of property requiring noxious weed control activities. The level of compliance for the control of regulated noxious weeds broadly matches the general standards achieved in the county.

#### ***Facilities Management Division***

Facilities Management Division (FMD) is a large land manager. Parcels managed vary in size from 432 square feet to 85 acres. Many of their holdings are odd-sized properties next to streets, as well as tidelands that are completely inundated by water. FMD's other responsibilities include buildings and offices owned by the county.

FMD does not have vegetation management staff to complete any kind of systematic vegetation management activities. FMD does not track the vegetation coverage on most of its parcels or potential noxious weed problems. They do respond to complaints from citizens and notification of needed noxious weed control work from the Noxious Weed Control Program by hiring contractors.

Their 2006 annual weed control expenditure of \$1,415 is small and reflects the small number of regulated weed infestations and FMD's minimal management of unregulated weeds. Total



amount of known regulated noxious weeds is 625 sq ft distributed between five parcels. Control of regulated weeds by FMD has been good and is implemented efficiently.

## **Key Strategic Issues and Recommendations**

### **1. Budget consistency (reflecting recognition by all land managers that noxious weed control is an essential, ongoing land management responsibility)**

Noxious weed management must compete with numerous other high priority demands on county budgets. Many divisions do not explicitly budget for noxious weed control and therefore appear to view this expenditure as discretionary. Avoiding noxious weed control, however, is a false economy. The need for noxious weed control management is predictable and on-going. Infestations that are allowed to seed and spread will cost substantially more to control than if they were controlled efficiently. Budgeting on a consistent basis for regular noxious weed management is usually the most cost effective approach.

#### ***Recommendation:***

Require county land managers who do not do so already to consistently budget for noxious weed control and that these budgets be explicit and externally transparent.

### **2. Insufficient data on the distribution and impacts of unregulated noxious weeds**

As this report indicated, we have generally good data on the distribution of regulated noxious weeds throughout the county. In contrast, our knowledge of the precise distribution and impact of unregulated noxious weeds is poor. This provides an insufficient basis for planning and implementation of control work.

***Recommendation:*** A systematic survey of the distribution and impacts of all noxious weeds on King County-owned large natural areas be funded and commissioned for 2008. This would be funded by a proportion of a proposed 2008 increase in the King County Noxious Weed Parcel Assessment.

### **3. Better planning**

Noxious weed management by county land managers is often implemented on a year-to-year basis with no clearly defined direction or long-term objectives. A planned approach is needed when dealing with the significant infestations present on many county lands. While the scale of the challenge is large, a long-term vision and a consistent approach can bring significant progress over time.

This approach has been demonstrated by the Green Seattle Partnership. Through the development and implementation of a 20-year strategy, this program aims to restore 2,500 acres of degraded, weed infested, urban native forest in Seattle. King County needs a similar plan. Existing plans such as the King County Open Space System Plan and the Natural Resource Lands Site Management Plans do not, in general, comprehensively address the noxious weed issue.

**Recommendation:** The major land management divisions each develop a noxious weed management plan defining noxious weed objectives, management priorities, performance measures, targets, key activities and budgets. These plans should be linked to an overarching strategy to be prepared by the King County Noxious Weed Control Program with an associated accountability and reporting mechanism. These plans should be completed by May 31, 2009, and should utilize data from the survey described in Recommendation 2.

#### **4. Insufficient resources for noxious weed control by some county lands managers**

Most county land managers provide sufficient resources for the control of regulated noxious weeds. However, this report has found that the level of investment in the management of unregulated noxious weeds is insufficient to effectively tackle this problem. It is probable that the impacts of unregulated noxious weeds in the existing infested areas are intensifying and that these areas are spreading.

The under-funding of unregulated noxious weed control is most pronounced in large natural areas, particularly King County Parks and Natural Resource Lands. This is being compounded by new acquisitions of Natural Resource Lands without proportionate increases in noxious weed control funding (or funding for other maintenance).

This reflects a structural budget problem in which considerable funding is available for acquisitions but resources for the management of these lands is limited. The lack of funding stability for Parks management has been recognized in 2003 by the Metropolitan Parks Task Force and resulted in the 2004 Parks Levy. In the short term, the 2008 Parks Levy process may provide an opportunity to address the need for additional funding. In the long term, this structural funding problem still needs to be addressed.

Funding required for the eradication of large areas of unregulated weeds will be significant. Weed control of these areas is more similar to a capital-intensive restoration project than a maintenance activity. It is important that this work is conducted as part of a carefully planned, priority-based process. It is also important that this weed control is associated with the restoration of desirable vegetation for the site.

**Recommendation:**

That the 2009 county budget identify increased levels of funding for the management of unregulated noxious weeds in King County Parks and on Natural Resource Lands. These funds should be sufficient to implement control of high priority infestations identified in the noxious weed management plans (Recommendation 3).

#### **5. Consideration of noxious weed issues before undertaking new acquisitions**

Significant new areas of land are being added to the county lands inventory every year. These lands are generally areas of high conservation or open space value. In particular, the Natural Resource Lands inventory is increasing. It is important that the capacity of the relevant land manager to adequately maintain this land is considered in the acquisition process.

***Recommendation:***

Ensure that proposed acquisitions are effectively surveyed for noxious weeds and any increased noxious weed management requirement is budgeted accordingly. Specifically, an accelerator should be included in the proposed 2008 Parks Levy to fund noxious weed control and other high priority maintenance activities on projected new acquisitions, and that funds be allocated for this purpose.

**6. Improve weed management technologies and methods by some agencies**

This report has identified several areas where agencies could improve their approaches to noxious weed control: 1) the inappropriate use and timing of mowing operations; 2) poor timing of weed control operations; 3) avoidance of the use of effective, low toxicity herbicides that could greatly assist weed control; and 4) lack of availability of weed control crews and resources at critical times for efficient weed control.

***Recommendation:***

RSD, SWD and WLRD Stormwater services review their weed control technologies and methods and ensure that the appropriate equipment and resources are available at the optimal time to control the target weeds. As a high priority, RSD will evaluate acquisition, through rental or purchase, of a second spray truck or an equivalent solution for additional roadside weed control by May 31, 2008. This equipment and the resources required to operate it will be obtained by May 31, 2009, consistent with the management plan described in Recommendation 3.

**7. Increase focus on Parks and Natural Resource Lands user communication and citizen participation**

Informed and committed citizens are an essential part of effective management of noxious weeds in county parks and Natural Resource Lands. Park users need to become more informed about the spread and impacts of noxious weeds and how they can help to minimize this. To effectively control the large areas of unregulated noxious weeds in King County parks and on Natural Resource Lands, increased volunteer effort and community stewardship is needed.

***Recommendation:***

Expand communication and outreach activities raising awareness of the noxious weed problem and increase participation in volunteer and stewardship activities on King County parks. The capacity to accommodate increased numbers of volunteers also needs to be expanded.

## Appendix A

### 2006 King County Noxious Weed List

<b>REGULATED CLASS A NOXIOUS WEEDS (eradication required throughout Washington State including King County)</b>	
Common Name	Scientific Name
velvetleaf	<i>Abutilon theophrasti</i>
garlic mustard	<i>Alliaria petiolata</i>
Italian thistle	<i>Carduus pycnocephalus</i>
slenderflower thistle	<i>Carduus tenuiflorus</i>
purple starthistle	<i>Centaurea calcitrapa</i>
bighead knapweed	<i>Centaurea macrocephala</i>
Vochin knapweed	<i>Centaurea nigrescens</i>
common crupina	<i>Crupina vulgaris</i>
eggleaf spurge	<i>Euphorbia oblongata</i>
goatsrue	<i>Galega officinalis</i>
reed sweetgrass	<i>Glyceria maxima (New)</i>
Texas blueweed	<i>Helianthus ciliaris</i>
giant hogweed	<i>Heracleum mantegazzianum</i>
yellow devil hawkweed	<i>Hieracium floribundum</i>
hydrilla	<i>Hydrilla verticillata</i>
dyers woad	<i>Isatis tinctoria</i>
floating primrose-willow	<i>Ludwigia peploides (New)</i>
wild four o'clock	<i>Mirabilis nyctaginea</i>
kudzu	<i>Pueraria montana var. lobata</i>
Mediterranean sage	<i>Salvia aethiopis</i>
clary meadow	<i>Salvia pratensis</i>
sage clary	<i>Salvia sclarea</i>
milk thistle	<i>Silybum marianum</i>
silverleaf nightshade	<i>Solanum elaeagnifolium</i>
buffalobur	<i>Solanum rostratum</i>
lawnweed	<i>Soliva sessilis</i>
johnsongrass	<i>Sorghum halepense</i>
dense flower cordgrass	<i>Spartina densiflora</i>
salt meadow cordgrass	<i>Spartina patens</i>
Spanish broom	<i>Spartium junceum</i>
spurge flax	<i>Thymelaea passerina</i>
Syrian bean-caper	<i>Zygophyllum fabago</i>

<b>REGULATED CLASS B NOXIOUS WEEDS (control required in King County)</b>	
Common Name	Scientific Name
Russian knapweed	<i>Acroptilon repens</i>
camelthorn	<i>Alhagi maurorum</i>
blackgrass	<i>Alopecurus myosuroides</i>
annual bugloss	<i>Anchusa arvensis</i>
common bugloss	<i>Anchusa officinalis</i>
wild chervil	<i>Anthriscus sylvestris</i>
hoary alyssum	<i>Bertoroa incana</i>
white bryony	<i>Bryonia alba</i>
fanwort	<i>Cabomba caroliniana</i>
plumeless thistle	<i>Carduus acanthoides</i>
musk thistle	<i>carduus nutans</i>
longspine sandbur	<i>Cenchrus longispinus</i>
spotted knapweed	<i>Centaurea biebersteinii</i>
diffuse knapweed	<i>Centaurea diffusa</i>
brown knapweed	<i>Centaurea jacea</i>
meadow knapweed	<i>Centaurea jacea x nigra</i>
black knapweed	<i>Centaurea nigra</i>
yellow starthistle	<i>Centaurea solstitialis</i>
rush skeletonweed	<i>Chondrilla juncea</i>
yellow nutsedge	<i>Cyperus esculentus</i>
blueweed; viper's bugloss	<i>Echium vulgare</i>
Brazilian elodea*	<i>Egeria densa</i>
leafy spurge	<i>Euphorbia esula</i>
polar hawkweed	<i>Hieracium atratum</i>
orange hawkweed	<i>Hieracium aurantiacum</i>
yellow hawkweed	<i>Hieracium caespitosum</i>
queen-devil hawkweed	<i>Hieracium glomeratum</i>
smooth hawkweed	<i>Hieracium laevigatum</i>
mouseear hawkweed	<i>Hieracium pilosella</i>
policeman's helmet	<i>Impatiens glandulifera</i>
kochia	<i>Kochia scoparia</i>
perennial pepperweed	<i>Lepidium latifolium</i>
Lepyrodiclis	<i>Lepyrodiclis holosteoides</i>
Dalmatian toadflax	<i>Linaria dalmatica ssp. dalmatica</i>
water primrose	<i>Ludwigia hexapetala</i>
garden loosestrife**	<i>Lysimachia vulgaris</i>
purple loosestrife**	<i>Lythrum salicaria</i>
parrotfeather	<i>Myriophyllum aquaticum</i>
yellow floating heart	<i>Nymphoides peltata</i>
Scotch thistle	<i>Onopordum acanthium</i>

**REGULATED CLASS B NOXIOUS WEEDS (control required in King County)**

Common Name	Scientific Name
hawkweed oxtongue	<i>Picris hieracioides</i>
sulfur cinquefoil	<i>Potentilla recta</i>
Austrian fieldcress	<i>Rorippa austriaca</i>
grass-leaved arrowhead	<i>Sagittaria graminea</i>
tansy ragwort	<i>Senecio jacobaea</i>
perennial sowthistle	<i>Sonchus arvensis</i>
smooth cordgrass	<i>Spartina alterniflora</i>
common cordgrass	<i>Spartina anglica</i>
swainsonpea	<i>Sphaerophysa salsula</i>
saltcedar	<i>Tamarix ramosissima</i>
hedgeparsley	<i>Torilis arvensis</i>
gorse	<i>Ulex europaeus</i>
* Brazilian elodea is designated for control throughout King County except in Lake Washington, Lake Sammamish, Lake Union and Lake Fenwick.	
** Purple and garden loosestrife are county-selected for control in all areas of King County including those excluded by WAC 16-750	

**REGULATED CLASS C NOXIOUS WEEDS (control required in King County)**

Common Name	Scientific Name
hairy willowherb	<i>Epilobium hirsutum</i>
hawkweeds, non-native and invasive	<i>Hieracium</i> spp.
common reed (non-native genotypes)	<i>Phragmites australis</i>

**UNREGULATED NOXIOUS WEEDS (Class B and C weeds from the State Noxious Weed List; control recommended but not required in King County.)**

Common Name	Scientific Name
absinth wormwood	<i>Artemisia absinthium (Moved)</i>
butterfly bush	<i>Buddleia davidii</i>
Canada thistle	<i>Cirsium arvense</i>

<b>UNREGULATED NOXIOUS WEEDS (Class B and C weeds from the State Noxious Weed List; control recommended but not required in King County.)</b>	
Common Name	Scientific Name
bull thistle	<i>Cirsium vulgare</i>
old man's beard	<i>Clematis vitalba</i>
poison-hemlock	<i>Conium maculatum</i>
field bindweed	<i>Convolvulus arvensis</i>
<b>Scotch broom*</b>	<b><i>Cytisus scoparius (Moved)</i></b>
herb Robert	<i>Geranium robertianum</i>
<b>Atlantic ivy</b>	<b><i>Hedera hibernica</i> 'Hibernica' (New name)</b>
English ivy cultivars 'Baltica', 'Pittsburgh' and 'Star'	<i>Hedera helix</i> 'Baltica' <i>Hedera helix</i> 'Pittsburgh' <i>Hedera helix</i> 'Star'
common St. Johnswort*	<i>Hypericum perforatum</i>
yellow flag iris	<i>Iris pseudacorus</i>
<b>yellow toadflax</b>	<b><i>Linaria vulgaris (Moved)</i></b>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
fragrant water lily	<i>Nymphaea odorata</i>
reed canarygrass	<i>Phalaris arundinacea</i>
Bohemian knotweed	<i>Polygonum bohemicum</i>
Japanese knotweed	<i>Polygonum cuspidatum</i>
Himalayan knotweed	<i>Polygonum polystachyum</i>
giant knotweed	<i>Polygonum sachalinense</i>
curly-leaf pondweed	<i>Potamogeton crispus</i>
common groundsel	<i>Senecio vulgaris</i>
common tansy	<i>Tanacetum vulgare</i>
* Control of Scotch broom is required on <b>King County's</b> section of SR-2 and on I-90 between mile marker 34 and the King/Kittitas County line.	
*Permit from KC Weed Board required to grow St. Johnswort as a crop in King County	

<b>WEEDS OF CONCERN (Formerly known as Obnoxious Weeds; widespread invasive plants that are not included under the State Noxious Weed Law.)</b>	
Common Name	Scientific Name
<b>hedge bindweed</b>	<b><i>Calystegia sepium (New)</i></b>
English holly	<i>Ilex aquifolium</i>
<b>yellow archangel</b>	<b><i>Lamium galeobdolon (New)</i></b>
English laurel	<i>Prunus laurocerasus</i>
Himalayan blackberry	<i>Rubus discolor</i>
evergreen blackberry	<i>Rubus laciniatus</i>

**WEEDS OF CONCERN (Formerly known as Obnoxious Weeds;  
widespread invasive plants that are not included under the State  
Noxious Weed Law.)**

Common Name	Scientific Name
bittersweet nightshade	<i>Solanum dulcamara</i>



## Appendix B

### Annual Customer Survey, Complaints about County Land

Date Received	Weed	Grade	Comments
11/20/2006	Tansy	None Given	You need to spend more time cleaning roadsides and parks of tansy before you require private property owners.
11/9/2006	Ragwort	A	Now that I recognize this weed, I'm seeing it all along the shoulder of the Issaquah-Hobart Rd. Who kills these?
11/14/2006	Tansy	A	Maybe to notify all neighbors in the spring. This would cover new residents. Also check the sides of the roads and detention ponds more often. It grows fast!!!
11/8/2006	Tansy	B	We clipped the new flowers and sprayed rosettes of new plants. That won't solve the tansy problems, however, because new seeds are blown in from tansy growing on public lands and alongside all highways.
11/28/2006	Purple loosestrife	B	More attention should be made to King County Road "rights away"
12/5/2006	Tansy ragwort	B	It would be nice if the letters sent out were not so threatening. They seem to assume resistance and non-compliance and made me very nervous. It is also annoying to be threatened with fines, etc. and then see roadsides covered with tansy.
1/5/2006	Tansy ragwort	C	It seems to me that your enforcement is rather arbitrary. I for years have driven by pastures with lots of tansy (never controlled) and especially driving rural roads I see tansy everywhere on the shoulders. Seems government should clean up its act first.
11/8/2006		C	I don't understand--all over the island I see this weed growing along Vashon Hwy, etc. No one takes time to eliminate these. Why individual homeowners then?
11/8/2006		C	King County did not spray roadway for noxious weeds but we sprayed these on our property.
11/14/2006	Tansy	C	I took care of the weeds on my property but they failed to take care of all the weeds along the county roads in the Maple Valley area. These weeds will be spread by traffic to all properties in this area.
11/8/2006	Tansy	F	Only got threatening notice. Very small amount of tansy on my property which we eliminated. Large amounts on right of ways which should be priority before threatening homeowners.
11/8/2006		F	I think it is reprehensible that this office threatens property owners with severe actions but does nothing at all about much larger rampant spread of the same noxious weed on King County property!
11/8/2006		F	I would like the County to control weeds on Road RW. I am trying to eliminate all birds that spread seeds.
11/20/2006	Tansy	F	This weed comes onto our property from County property on roadside. They should be controlling these things too.
11/22/2006	Tansy	F	The main problem here is that this noxious weed grows along the County road right of way and is not dealt with allowing airborne seeds to spread out of control. If the county would do its part, the problem could be eradicated. As it is the problem will never be solved. The County and its minions need to walk their talk or shut up. Also thanks and threats do not mix. Chose a message, preferably not a fascists one.
11/28/2006	Tansy	F	You have more tansy on public ROW than most pastures. Your data re: animals deaths is inaccurate [sic] and outdated. Horse and cows do not eat tansy.