ENVIRONMENT COMMITTEE

HIS WORSHIP, THE MAYOR
AND COUNCILLORS

SUBJECT: STILL CREEK WATERSHED INVASIVE SPECIES MANAGEMENT

RECOMMENDATIONS:

1. **THAT** Council endorse the proposed approach to invasive species management as outlined in Section 5.0 of this report.

2. **THAT** Council forward this report to the City Manager, City of Vancouver and the Chief Administrative Officer, Greater Vancouver Regional District.

REPORT

The Environment Committee, at its Open meeting held on 2006 June 13, received and adopted the *attached* report requesting approval of a proposed approach to invasive species management in the Still Creek Watershed. The Committee advised that the proposed approach includes the following elements:

1. mapping – understanding scope of invasives
2. prevention – public education
3. risk management – monitor and remove hazardous species
4. pilot projects to monitor native replanting
5. pilot projects to test natural area management approaches
6. continued invasive species and habitat monitoring.

:COPY – CITY MANAGER
DIRECTOR PLANNING & BUILDING
DIRECTOR ENGINEERING
DIR. PARKS, REC. & CULTURAL SERV.
DIRECTOR FINANCE

The Committee noted that the City will continue to monitor progress and report back to Council on an annual basis. The Committee concluded by advising that the proposed program can be accomplished within existing budgets at this time.

Respectfully submitted,

Councillor Dan Johnston
Chair

Councillor Pietro Calendino
Vice Chair

Councillor Lee Rankin
Member

City of Burnaby

Meeting 2006 June 13

COMMITTEE REPORT

TO:	CHAIR AND MEMBERS ENVIRONMENT COMMITTEE	**DATE:**	2006 June 8
FROM:	DIRECTOR PLANNING AND BUILDING DIRECTOR PARKS, RECREATION AND CULTURAL SERVICES DIRECTOR ENGINEERING	**FILE:** *Reference:*	PL 33000 – 30 *Biodiversity - Still Creek Invasive Species Management*

SUBJECT: STILL CREEK WATERSHED INVASIVE SPECIES MANAGEMENT

PURPOSE: To obtain Committee and Council approval to proceed on an approach to invasive species management in the Still Creek Watershed.

RECOMMENDATIONS:

1. **THAT** the Committee recommend that Council endorse the proposed approach to invasive species management as outlined in Section 5.0 of this report.

2. **THAT** the Committee recommend that Council forward this report to the City Manager, City of Vancouver and the Chief Administrative Officer, Greater Vancouver Regional District.

REPORT

1.0 INTRODUCTION

For many years, the City, streamkeepers, senior governments and developers have sought to promote native vegetation in Burnaby, following the 1998 City Official Community Plan and 1995 City Environmentally Sensitive Areas Strategy goals to "preserve ecological continuity ... plant native materials ... and protect micro habitats". Building on this work, over the past five years, the City of Burnaby has been a working partner in research and development of a draft Biodiversity Conservation Strategy for the GVRD. The draft strategy document is being written in consultation with partners and stakeholders over the next six months.

An important aspect of biodiversity conservation is maintenance of native planting and containment of invasive species. This report outlines findings from a pilot project from the Still Creek Watershed, that was developed as part of the draft Biodiversity Conservation Study and draft Still Creek Integrated Stormwater Management Planning processes. More information on these two larger projects appears elsewhere on the June Environment Committee agenda.

The following report provides background information on invasive species in the Still Creek Watershed and outlines a proposed pilot project to better manage this issue. The report is based on technical analysis from the following 3 recent studies, prepared under guidance of intergovernmental steering committees, including Burnaby staff:

1. Consultant Reports on Regional Biodiversity Conservation (Axys 2005);
2. Detailed Photo-Interpreted Habitat Mapping and Biodiversity Analysis for The Watershed (Axys 2005); and
3. Field Studies, Mapping, and Recommendations for Invasive Species Management in The Still Creek Watershed (Raincoast 2006).

2.0 HABITAT IN STILL CREEK WATERSHED

The watershed is heavily-urbanized, with only 20% of the land-base vegetated, and only 7% covered in natural vegetation (as opposed to grass and lawn). Most of these natural areas are along stream corridors (e.g., Still Creek, Renfrew Ravine, Beecher Creek, Guichon Creek, Chub Creek) or within Burnaby Lake Park. While the watershed lacks large habitat areas, it is adjacent to some regionally-significant habitat reservoirs and refuges – namely Burnaby Lake, Deer Lake, Burrard Inlet, and Burnaby Mountain. These adjacent areas increase the value and importance of habitat within the Still Creek Watershed, providing nesting, rearing and foraging habitat for native species found in the watershed. These species include great blue heron, red-tailed hawk, coopers hawk, and cut-throat trout.

The draft Still Creek ISMP envisages increasing the size and connections of the habitats within the watershed as part of a vision of improving environmental assets, reducing flood risk (by moving development further back from the creek), and providing accessible recreational corridors from town centres and neighbourhoods to Burnaby Lake. Key enhancement areas focus around creating a continuous conservation area along Still Creek and its tributaries.

3.0 INVASIVE SPECIES IN STILL CREEK WATERSHED

Ecologists note that after habitat loss, invasive species are the highest threat to global biodiversity. In the Lower Mainland, numerous non-native species have been introduced for gardening and landscaping purposes. Most of these species do not compete with native species in natural areas, but a small group of non-natives have succeeded in competing and sometimes dominating natural areas. These non-natives are termed "invasive species", and include Himalayan blackberry, English ivy, Japanese knotweed, purple loosestrife, and Scotch broom.

Invasive species are typically highly competitive, forming dense patches where they monopolize resources, greatly simplify the vegetation diversity and structure, and can kill or smother native vegetation. These invasive habitats are often inhospitable for native bird and wildlife nesting or foraging. Some species contain human health hazards, such

as giant hogweed, which produces a sap which burns human skin when exposed to light. Other species, such as policeman's helmet increases stream erosion as it dies back in the winter months, leaving bare exposed soil on stream banks. Once invasive species become established, removal can be resource-intensive. Proactive management is therefore far more cost effective.

In the fall of 2005, Raincoast Applied Ecology mapped invasive species in the streamside areas within the Still Creek Watershed. Raincoast found that although there is just a small number of invasive species, these plants have infested a third of all streamside vegetated areas. ***Table 1*** outlines the key invasive species found and comments on their ecological impacts. These invasive species typically enter natural areas along "edge habitat", such as neighbouring back-yard areas (particularly where neighbours dump garden waste into natural areas), utility lines, trails, roads, and streamside areas.

Table 1: Most Common Invasive Species In Still Creek Watershed Streamside Areas

Species	Presence as a percent of all streamside vegetation	Preferred habitat	Key ecological threats
Himalayan blackberry	20%	grasslands, forest edges, shrub communities, deciduous and mixed forest, riparian zones	▪ Smothers existing native vegetation (groundcover, shrubs, small trees) ▪ Fast invader (over 3.3m per year) ▪ Provides no shade to streams ▪ Creates monoculture thickets (favoured as rat habitat)
Reed canary grass	7%	wet fields, freshwater wetlands, riparian zones	▪ Smothers native wetland vegetation ▪ Changes diverse habitats into a monoculture ▪ Poor habitat for native mammals e.g., voles (an important part of food chain)
English ivy	3%	coniferous, deciduous and mixed forest, riparian zones	▪ Slowly strangles and kills trees and shrubs ▪ Outshades native ground cover
Policeman's helmet	1%	freshwater wetlands, riparian zones, forest edges	▪ Fast invader ▪ Dies back in winter months, leaving bare soils on streambanks, thus increasing erosion and sedimentation
Japanese knotweed	1%	grasslands, forest edges, shrub areas, riparian zones	▪ Over- shadows and outcompetes native plants (3.3m tall) ▪ Very difficult to control (spreads through root and stem shards)

Data source: Raincoast Applied Ecology, October 2005.
Note: Other species accounting for less than 0.3% of streamside areas per species include yellow lamimum, common hops, common tansy, common periwinkle, Scotch broom, and morning glory.

4.0 PREVIOUS INVASIVE SPECIES MANAGEMENT

For many years, the City, streamkeepers, senior governments and developers have sought to promote native vegetation in Burnaby, through replanting and invasive species

management initiative. However, to date, there has been no comprehensive landscape-wide, coordinated effort to manage invasive species.

Invasive species are an inevitable threat for natural areas adjoining urban areas, and completely removing and managing the threat would be resource-intensive. Nonetheless, management steps can be taken to reduce the impact of invasive species and protect native habitats wherever possible. To this end, Section 5.0 outlines ways that the City can integrate invasive species management into existing programs.

5.0 PROPOSED APPROACH TO INVASIVE SPECIES MANAGEMENT

It is proposed that the City advance invasive species management through a pilot project in the Still Creek Watershed. This pilot project would make use of the excellent partnerships already built with other agencies, through the ISMP, Biodiversity Conservation Strategy and other projects. It would also use the existing mapping as baseline information. The following section and ***Figure 1*** outline 6 steps for improving invasive species management. Some of these steps are already underway.

5.1 Mapping - Understanding Scope of Invasives

As outlined in previous sections, the City has completed excellent mapping of invasive species in the case-study watershed of Still Creek. This mapping allows prioritization of sites and areas for additional action.

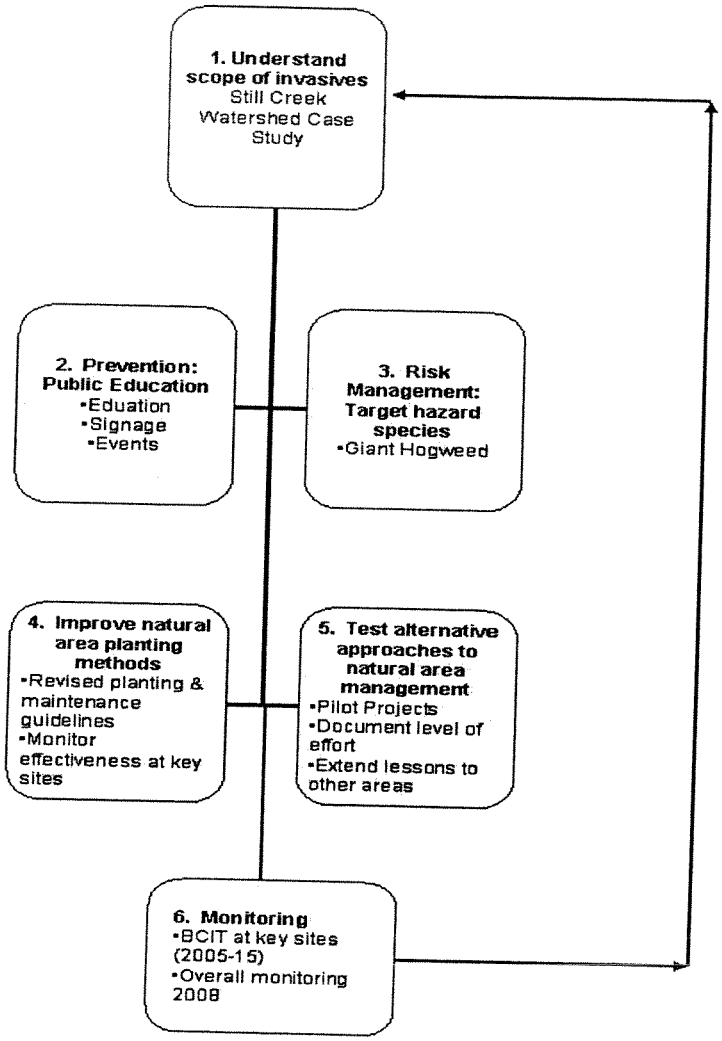
5.2 Prevention - Public Education

Preventing the release of invasive species is far more cost-effective than managing them once they are established. Public education is therefore a key component of invasive species management, and messages should be integrated into existing programs, such as the "Let it Grow Naturally" program, park signage, land development processes, environmental events, and City partnerships (e.g., streamkeepers, Burnaby Lake Park Association). Messages should include:

a. No dumping of yard and garden waste into natural areas (instead of using the City yard and garden waste pick-up service);
b. Education on which plants are invasive species, and strong advice to avoid planting invasive species within gardens (there are many beautiful native and non-native species that are not invasive); and
c. Removing invasive species wherever possible from private property, using appropriate removal and disposal techniques.

Excellent educational materials are available from the Invasive Plant Council of BC and can be adapted for Burnaby use (see ***Attachment A***).

Figure 1: Proposed Pilot Invasive Species Management Strategy



5.3 Risk Management - Monitor and Remove Hazardous Species

The primary species with risk management issues that could potentially be found in Burnaby is giant hogweed. It is a human health hazard, as its sap can burn human skin when exposed to light. Giant hogweed has been mapped on the North Shore, Vancouver, Coquitlam, and Surrey, and in 2006, the first Burnaby site was positively identified. Burnaby outside crews took immediate action and have been instructed to report any signs of further spread, so that it can be removed –

preventing infestation and human health risks. Staff will remain alert for any other hazardous invasive species.

5.4 Pilot Projects to Monitor Native Replanting Methods

During land development, considerable resources are often spent planting or enhancing natural areas (particularly if the development site is adjacent to a watercourse). Despite this investment, native plantings often fail as the site is overwhelmed by invasive species. As part of their Still Creek mapping, Raincoast Applied Ecology have recommended revised planting procedures for natural areas to improve native plant survival. These procedures include site preparation, species selection and site monitoring and maintenance. The procedures may increase upfront landscaping costs depending on the site and prescription, but will reduce long-term maintenance and management costs of addressing invasive species.

The Department of Fisheries and Oceans note that they have no objections to these guidelines updating the old senior government guidelines for streamside planting. Burnaby staff therefore recommend integrating the procedures into City planting guidelines, and closely monitoring the success of the procedures at seven selected sites in the Still Creek Watershed (see ***Figure 1*** and ***Table 2***).

Table 2: Proposed Native Replanting Monitoring Sites

Site		Owner	Size	Targeted Invasive Species	Management Approach
CC-2	Jim Lorimer Park	City Park	1 ha	Reed Canary Grass Himalayan blackberry	Park development funded through Brentwood Town Centre density bonusing.
SC13	Central Valley Greenway (s. 2) at Still Creek	City	170m^2	Himalayan blackberry	Removal of invasive, planting of large shading trees.
SC15	Costco	Costco	1ha	Reed Canary Grass Himalayan blackberry Policeman's helmet	Removal of existing invasives and native replanting, as part of Costco site redevelopment
SC15	Ardley Creek	City	0.5 ha	Reed Canary Grass Himalayan blackberry Policeman's helmet	Removal of existing invasives and native replanting, as part of City Works Yard off-site project
BC 5	Central Valley Greenway (s. 7) at Beecher Creek	City	240m^2	Reed Canary Grass Himalayan blackberry Japanese Knotweed	Removal of invasives, and replanting through CVG project
SC 19	Central Valley Greenway (s. 7) at Beecher Creek	City	740m^2	Reed Canary Grass Himalayan blackberry Japanese Knotweed	Removal of invasives, and replanting through CVG project
SC 20	Central Valley Greenway (s. 8) west of Sperling	City	1,512m^2	Reed Canary Grass	Removal of invasives, and replanting through CVG project

5.5 Pilot Projects to Test Natural Area Management Approaches

Ecologists recognize that sustaining native ecosystems in an urban context requires some management intervention, in order to control invasive species and regenerate native habitats. To date, there have been limited management interventions on naturalized City lands, beyond trail maintenance, tree hazard management, native replanting during special events, and volunteer stream stewardship initiatives. Tackling this issue City-wide would require a commitment of additional resources. In order to better evaluate levels of required effort, five 3-year partnership-based pilot projects are proposed within the Still Creek Watershed (***Figure 1*** and ***Table 3***). These projects address key invasive species, target areas with specific environmental gains, can be funded at present through existing City operational or partner budgets, and will allow the City to better evaluate the costs of realizing a long-term strategy for invasives management. All pilot projects use non-chemical control means, but staff recognize that an Integrated Pest Management (IPM) may be required in the future (e.g., for geotechnical reasons). The Environment Committee and Council will be further consulted prior to any pursuance of chemical options.

Table 3: Proposed Natural Area Management Pilot Sites

Site		Owner	Size	Targeted Invasive Species	Management Approach
SC-9	3900 block Still Creek Avenue Right of Way	City, Crown	0.03 ha	Japanese Knotweed, Himalayan blackberry	BCIT continued management (with City staff resources for vegetation disposal).
SC 13, 14	Still Creek mainstem	City (GVRD Right of Way)	1.3 ha	Policeman's helmet Japanese knotweed	Work with GVRD to remove Policeman's helmet to reduce erosion risk.
GC 6,7,8	Guichon Creek	BCIT	1.8 ha	Himalayan blackberry English ivy Japanese knotweed	BCIT forest enhancement as part of BCIT land management
-	Discovery Place Conservation Area (around Electronic Arts)	City	26 ha	Himalayan blackberry, English Ivy, Lamium	10 year forest enhancement plan funded by EA, including invasive species management component
BC 1,2,3	Beecher Creek Ravine	City	6 ha	Policeman's helmet Himalayan blackberry English Ivy	Streamkeepers' continued management (with City staff resource for vegetation disposal).

5.6 Continued Invasive Species and Habitat Monitoring

In 2005, BCIT embarked on a long-term monitoring strategy of the Still Creek corridor, supported by a number of partners, including the City of Burnaby. Monitoring will cover invasive species, small mammals, birds, fish and recreational use of the corridor. Data from this monitoring will assist in the long-term appraisal of invasives management.

6.0 CONCLUSION

Many of the streamside areas along the Still Creek watercourse system have been heavily impacted by invasive species. This report suggests a strategy for helping to prevent further incursions, manage risk, and test alternative planting and management strategies. Implementation requires strong partnerships with the City of Vancouver, GVRD, BCIT, landowners, developers and streamkeepers. The City should continue to monitor progress on an annual basis, to identify lessons that can be applied elsewhere in the City. Staff will report back to the Environment Committee and Council on an annual basis. The proposed program can be accomplished with existing budgets at this time.

J.S. Belhouse, Director
PLANNING AND BUILDING

K. Friars, Director
PARKS, RECREATION AND CULTURAL SERVICES

W.C. Sinclair, Director
ENGINEERING

RW:jc:sa
Attachment

Copied to: City Manager
Director Finance

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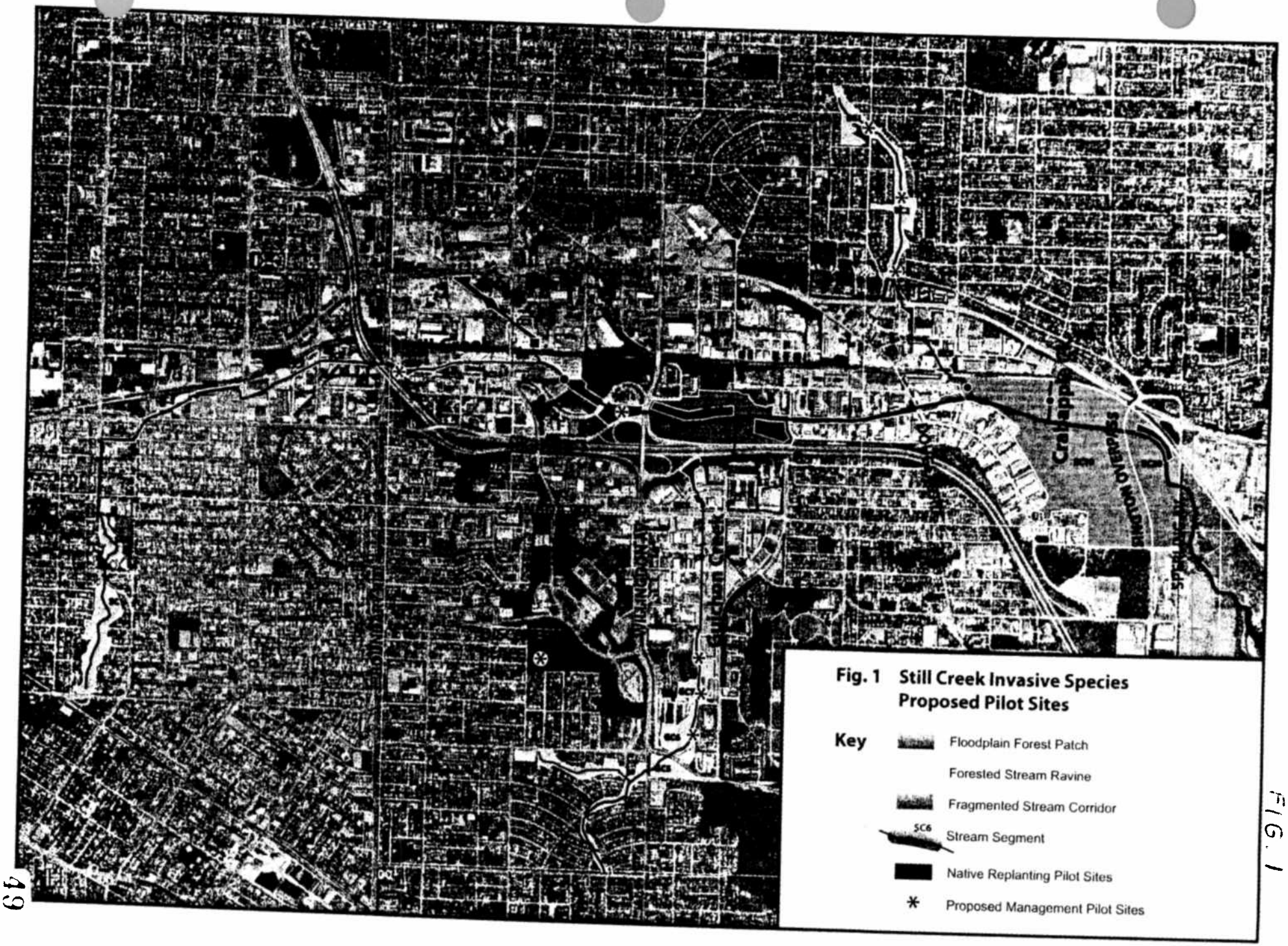
Fig. 1 Still Creek Invasive Species
Proposed Pilot Sites
Key
Floodplain Forest Patch
Forested Stream Ravine
Fragmented Stream Corridor
SC6
Stream Segment
Native Replanting Pilot Sites
Proposed Management Pilot Sites

FIG. 1

ATTACHMENT A

Attachment A

Native Species

Gardeners of British Columbia are rediscovering and appreciating the beauty and diversity of native plants. Native species are well-adapted to the local climate, which often helps to reduce water use, minimize weeding and other garden maintenance, and improve garden soil.

NPSBC Native Plant Society
of British Columbia
www.npsbc.org

Naturescape B.C.
http://www.hctf.ca/nature.htm

More Information on Invasive Plants

B.C. Ministry of Agriculture and Lands, Invasive Plant Alert
http://www.agf.gov.bc.ca/cropprot/invasiveplant.htm

E-Flora B.C.
www.eflora.bc.ca

Garry Oak Ecosystems Recovery Team
www.goert.ca

WeedsBC
www.weedsbc.ca

Alberta Invasive Plants Council
www.invasiveplants.ab.ca

Washington State Noxious Weed Board
www.nwcb.wa.gov/weed_info/escaped_ornamentals/Escaped_ornamentals_home.htm

Linking Ecology and Horticulture
www.centerforplantconservation.org/invasives/codes14.html

Common Hops
(*Humulus lupulus*)

Blueweed
(*Echium vulgare*)

Acknowledgements

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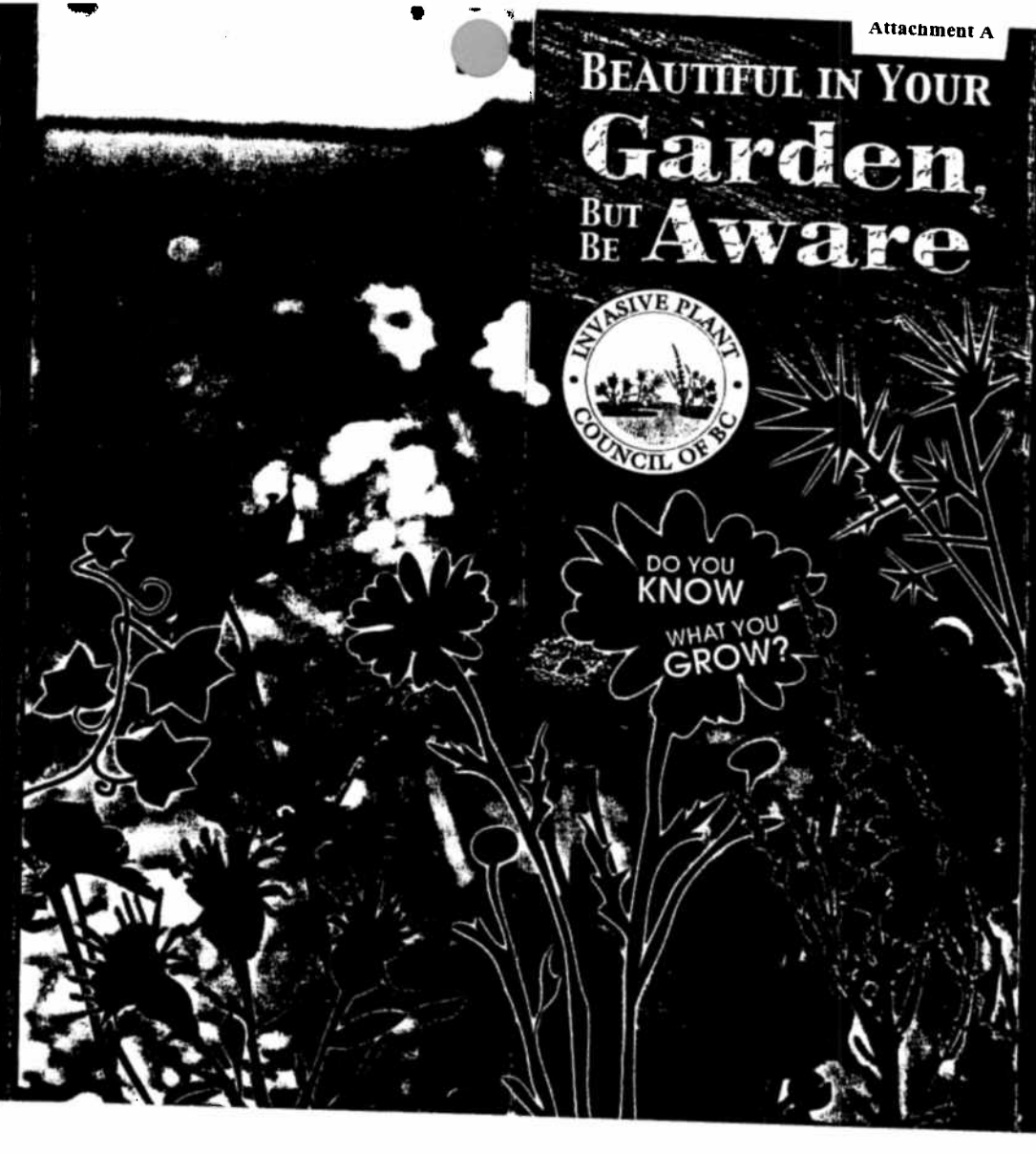
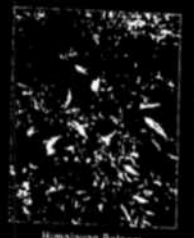


BEAUTIFUL IN YOUR Garden, BUT BE Aware

INVASIVE PLANT COUNCIL OF BC

DO YOU KNOW WHAT YOU GROW?

Traveller's Joy
(*Clematis vitalba*)



Himalayan Balsam
(*Impatiens glandulifera*)

Night-Flowering Catchfly
(*Silene noctiflora*)

Spanish Broom
(*Spartium junceum*)

What are Invasive Plants?

Everyone loves beautiful plan Flowers and shrubs adorn our gardens, homes, parks and p spaces. Canadians spend countless hours improving the sensory landscape around th homes, institutions and schoo And many plants attract bird butterflies and other wildlife seeking food and shelter.

Gardeners have a long tradit of moving plants to new regio and the popularity of gardeni has increased the importation plants into Canada from othe regions of the world. British Columbia's range of climates from the maritime climate on southeastern Vancouver Islan the varied continental regimes through the Interior—allow gardeners to grow a wide ran of interesting trees, shrubs and flowers.

Some plants that are sown or planted in gardens with ideal growing conditions, but witho the plant's natural pests and predators, are able to easily spread through their fruits, seed or roots. These invasive plants o alien species that have the potential to pose undesirable o detrimental impacts on human animals or ecosystems. Invasive plants grow rapidly, spread quickly, are tolerant of tough conditions and can form dense patches. Invasive plants may displace native species and disrupt natural ecological processes in adjacent parks an natural areas. The "invasiveness of a plant, however, may be affected by the planting zone i which it is grown.

ATTACHMENT A

Aggressive horticulture species spread from garden beds, hanging baskets and improperly disposed garden waste to invade adjacent parks and nearby natural areas.

Common Periwinkle
(Vinca minor 'Atropurpurea')

B.C. LANDSCAPE & NURSERY ASSOCIATION

BRITISH COLUMBIA
Ministry of Agriculture and Lands

BRITISH COLUMBIA
Ministry of Environment

Purple loosestrife invades wetlands and destroys important wildlife habitat.

Purple Loosestrife
(Lythrum salicaria)

English ivy climbs trees and shades out native forest floor plants.

English Ivy
(Hedera helix)

Dalmatian toadflax invades rangelands of the Interior.

Dalmatian Toadflax
(Linaria genistifolia ssp. dalmatica)

Scotch broom interferes with forest regeneration and significantly affects endangered native plant species.

Scotch Broom
(Cytisus scoparius)

Four Questions to Ask About a New Plant

Before you plant a new species in your garden—whether you bought it from a nursery or yard sale, or received it from a friend or neighbour—ask yourself these questions:

1. "Will the plant be invasive outside my garden?"
Many plant traits that are desirable to gardeners—such as easy germination and establishment, tolerance to drought and frost, rapid growth and abundant seed production—enable a plant species to become invasive.

2. "If I order a plant from outside British Columbia, could it be invasive in my environment?"
It is possible, although there may be a lag phase before a plant becomes invasive.

3. "What do I need to know from my local nursery or garden centre?"
(a) Find out if a plant is a "fast spreader" or a "vigorous self-seeder" in your planting zone. If so, these are warning signs that the species may be invasive.
(b) Investigate if the plant is known to be invasive elsewhere around the world.

4. "Is there an alternate plant I can use instead of one with the potential to become invasive?" Check the availability of alternative, non-invasive plants suitable for your area.

Butterfly Bush
(Buddleja davidii)

Daphne-laurel
(Daphne laureola)

Gardeners and Invasive Plants

Invasive plants are capturing the interest and concern of many gardeners. People want to avoid planting ornamental and food species that can spread out of control to other gardens and surrounding grasslands, forests and parks. They also want to eliminate invasive species and noxious weeds from their garden.

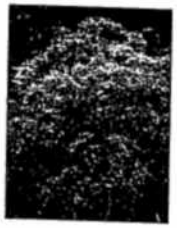
Some of the most harmful invasive plants in British Columbia, are:

- Purple loosestrife
- English ivy
- Dalmatian toadflax
- Scotch broom
- Oxeye daisy
- Giant hogweed
- Japanese knotweed
- Himalayan blackberry

There are often several alternate species for each of these invasive plants. For example, instead of English ivy, consider crinkle leaf creeper *(Rubus calycinoides)*, Siberian cypress *(Microbiota decussata)* or wintercreeper euonymous *(Euonymous x fortunei* cultivars). Nurseries, garden clubs and websites can provide more information about alternate species suitable for a specific growing area.

Invasive Plants are Introduced in Three Ways:

1. Through intentional introduction as an ornamental or food plant;
2. By natural dispersal from one area to another by birds, wildlife, livestock, vehicles, railway cars and wind; and
3. As an unintentional by-product of disposal, primarily by garden waste dumping.



Baby's Breath
(Gypsophila paniculata)

Queen Anne's Lace
(Daucus carota)

10 Things You Can Do About Invasive Plants

1. **Learn** about the potential invasiveness of new species before you grow them.
2. **Do not purchase or grow** invasive or legislated noxious weed seeds or plants.
3. If you identify an invasive species, **remove all of the plant parts and dispose** of them carefully.
4. **Avoid letting invasive plants fruit or set seed**, as birds and animals can spread the plants to other areas.
5. **Properly dispose of yard and garden waste and hanging baskets** into a properly functioning compost pile or facility, or by drying out any material sufficiently to kill remaining vegetative parts.
6. **Avoid using wildflower seed mixes**, as most consist of invasive species or species not adapted to local conditions.
7. **Avoid picking plants** from roadsides, gravel pits or other disturbed areas. Many of the prettiest wildflowers growing on roadsides are aggressive invasive species that should not be moved to new areas.
8. **Grow regional native plants** in your garden, as they are naturally adapted to the local environment and are non-invasive.
9. **Discourage propagation of invasive species** by friends and neighbours. Talk with them about the impacts of invasive plants and the use of suitable alternatives.
10. **Contribute to local efforts** to manage invasive plants. Contact your local invasive plant committee from information on the Invasive Plant Council of British Columbia website.

rail, and rights-of-way used for livestock grazing.

Oxeye Daisy
(Chrysanthemum leucanthemum)

Giant hogweed is a member of the carrot family that produces toxic sap.

Giant Hogweed
(Heracleum mantegazzianum)

Japanese knotweed shades out native species in riparian areas.

Japanese Knotweed
(Fallopia japonica)

Himalayan blackberry invades open, grassy areas and riparian zones and decreases native ground covers.

Himalayan Blackberry
(Rubus armeniacus)

51

Invasive
cause esti
crop losses
$50 million annu
B.C. Species s
knapweed
rangelan
reduce forage
and many
species outco
desired spe
cultivated

Yellow Lamiu
(Lamium galeob

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For more inform
please cont

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INVASIVE PL
COUNCIL O