Comox Valley REGIONAL DISTRICT

Staff Report

DATE: June 3, 2019

FILE: 6130-04

TO: Chair and Directors
Electoral Areas Services Committee

FROM: Russell Dyson
Chief Administrative Officer

Supported by Russell Dyson
Chief Administrative Officer

R. Dyson

RE: Chemical Treatment of Invasive Plant Species

Purpose
The purpose of this report is to provide information comparing treatments for invasive plant removal including a financial comparison of mechanical versus chemical treatments. This is for information purposes only.

Executive Summary
This report builds upon the staff report on pesticide use in regional parks presented at the May 13, 2019 Electoral Areas Services Committee meeting.

Invasive plant species are classified as noxious, invasive or alien invasive where "alien" refers to a species that is not native. Noxious weeds are plants (and their seeds) legislatively designated under the *Weed Control Act* as provincially or regionally noxious.

The removal of invasive plant species is often best managed through an integrated approach that involves the use of a variety of treatment techniques. In most cases chemical treatments are more cost effective but in parks chemical treatments are rarely used. Careful consideration for the use of herbicides includes:

- financial costs;
- species containment;
- disposal;
- public relations considerations.

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Background/Current Situation

For clarity of terminology, an invasive plant species generally refers to 'any invasive alien plant species that has the potential to pose undesirable or detrimental impacts on humans, animals, or ecosystems' (ISC, 2018). This includes all plant species that are noxious, invasive or alien invasive where "alien" refers to a species that is not native.

Invasive plant species are generally characterized as being prolific seed producers; having seeds that spread easily and effectively; quick to establish and thrive on disturbed sites; and lack natural predators. They can be a huge threat to biodiversity and can be expensive to control. Non-native invasive plant species 'pose a threat to our environment, health, safety and economy due to their ability to spread quickly and overwhelm native species, creating monocultures that can damage existing flora and fauna' (ISC, 2018). Current high priority invasive plant species for the parks department include knotweed (Fallopia sp), giant hogweed (Heracleum mantegazzanium), and yellow-flag iris (Iris pseudacorous).

Noxious weeds are plants (and their seeds) designated under the *Weed Control Act* as provincially or regionally noxious. As per this legislation, these plants must be controlled by the occupiers of the land. A list of the noxious weeds are listed in Appendix A.

According to the Invasive Species Council of BC (ISC), the following integrated pest management tools are available to control invasive species:

- Mechanical
- Cultural
- Biocontrol
- Burning
- Herbicides
- Grazing

Each of the above treatments have pros and cons. The treatments are listed in the table below. Using a combination of the treatments is referred to as an integrated approach.

Treatment	Pros	Cons
Mechanical (mowing, digging, etc)	Effective on annual species and small sites	May foster rather than suppress growth (species dependant)
Cultural (modifying habitat to promote desired plants)	Natural process	Long-term control method, species specific
Biocontrol (using insects)	Cost effective on large sites	Long-term control method, usually slow to take effect
Burning (use of fire)	Natural process	Some seeds may be fire resistant, uncontrolled fire possible, other desirable plants could be killed
Herbicides (chemicals)	Time-efficient, cost effective on large sites	Timing is important, research on health effects on-going
Grazing (use of animals)	Natural process	Species specific, other desirable plants could be killed

Disposal of invasive plant species also needs to be considered. Since invasive plants are proficient at spreading and often only require small fragments to regrow, proper disposal planning is required. Preventing the spread of existing invasive plant species is an important consideration.

Removal of invasive plant species as part of park development projects or natural area restoration projects is considered a best management practice.

Policy Analysis
The Comox Valley Regional District has a policy on pesticide use on regional district property (Policy 5280-05). This policy states there shall be no cosmetic use of pesticides on regional district properties with the exception of golf courses.

Financial Factors
In terms of economic impacts, invasive plant species have the potential to harm agricultural and forestry lands in the Comox Valley. The ISC suggest that if left uncontrolled, invasive plants can 'increase their distribution area on average 14 per cent annually' (ISC, 2018).

Data from the 2018-2019 'Invasive Plant Transfer Payment Agreement Annual Reporting' shows an average cost for chemical treatment of $192.41 per site and the average cost of mechanical treatment of $267.09 per site. In the Comox Valley there were 157 sites totalling 17.4ha that were chemically treated (these were all noxious weeds), whereas 111 sites totally 94.1 ha were mechanically treated (this included noxious weeds and non-native invasive plants). A breakdown of treatments used and targeted species in the Comox Valley can be found in Appendix B.

Comparison of non-native invasive plant species treatment options for the Hardy Road parking area project (mechanical versus chemical) can be found in Appendix C. In summary, chemical treatment with mechanical scraping and leaving the material on site would cost approximately $8,500 compared to $52,500 for mechanical treatment and removal to a disposal site. This difference in cost is largely due to the costs of trucking and disposal. Additional future costs could be also be incurred if some of the plants and/or seeds were not effectively contained during transport and led to new infestations.

Legal Factors
Legally, the *Weed Control Act* (administered by the province) places a duty on land occupiers to control the noxious weeds listed under the regulation.

Citizen/Public Relations
Recent chemical treatment used in the Hardy Road parking area project created some concerns from the adjacent landowners.

Attachments: Appendix A – "List of Noxious Weeds"
Appendix C – "Information on Treatments Used and Species Comparison"
Appendix B – "Hardy Road parking area –Invasive removal cost comparison"

References:
ISC Invasive Species Council of BC. Invasive Species Toolkit for Local Government, Real Estate Professionals and Land Managers. November 2018.

Appendix A

List of Noxious Weeds

REGULATION: PROVINCIALLY NOXIOUS

- Bur Chervil *(Anthriscus caucalis)*
- Canada Thistle *(Cirsium arvense)*
- Common Reed *(Phragmites australis* subsp. *australis)*
- Cordgrass, Dense-flowered *(Spartina densiflora)*
- Cordgrass, English *(Spartina anglica)*
- Cordgrass, Saltmeadow *(Spartina patens)*
- Cordgrass, Smooth *(Spartina alterniflora)*
- Crupina *(Crupina vulgaris)*
- Dodder *(Cuscuta* spp.*)*
- Flowering Rush *(Butomus umbellatus)*
- Garlic Mustard *(Alliaria petiolata)*
- Giant Hogweed *(Heracleum mantegazzianum)*
- Giant Mannagrass/Reed Sweetgrass *(Glyceria maxima)*
- Gorse *(Ulex europaeus)*
- Hound's-tongue *(Cynoglossum officinale)*
- Jointed Goatgrass *(Aegilops cylindrica)*
- Knapweed, Diffuse *(Centaurea diffusa)*
- Knapweed, Spotted *(Centaurea stoebe)*
- Knotweed, Bohemian *(Fallopia x bohemica)* Knotweed, Giant *(Fallopia sachalinensis)*
- Knotweed, Himalayan *(Polygonum polystachyum)*
- Knotweed, Japanese *(Fallopia japonica)*
- Leafy Spurge *(Euphorbia esula)*
- Milk Thistle *(Silybum marianum)*
- North Africa Grass *(Ventenata dubia)*
- Nutsedge, Purple *(Cyperus rotundus)*
- Nutsedge, Yellow *(Cyperus esculentus)*
- Purple Loosestrife *(Lythrum salicaria)*
- Rush Skeletonweed *(Chondrilla juncea)*
- Scentless Chamomile *(Matricaria maritima)*
- Sow-thistle, Annual *(Sonchus oleraceus)*
- Sow-thistle, Perennial *(Sonchus arvensis)*
- Tansy Ragwort *(Senecio jacobaea)*
- Toadflax, Common / Yellow *(Linaria vulgaris)*
- Toadflax, Dalmatian *(Linaria genistifolia)*
- Velvetleaf *(Abutilon theophrasti)*
- Wild Oats *(Avena fatua)*
- Yellow Flag Iris *(Iris pseudacorus)*
- Yellow Starthistle *(Centaurea solstitialis)*

Appendix B

Invasive plant species treatment comparison as found in the 2018-19 annual reporting of the Invasive Plant Transfer Payment Agreement. This report summarizes invasive plant management for the region and is provided to the province.

In this reporting period within the CVRD Parks, inventories, surveys and treatments of invasive plants targeted the following species:

- Hogweed
- Vinca
- Lamium
- Ivy
- Yellow flag-iris
- Purple loosestrife
- Blackberry

Overview of treatment and targeted species breakdown for all jurisdictions in the Comox Valley:

Invasive Plant Treatment Summary (consider all jurisdictions)						
Invasive Plant Species	**Chemical Trt.**		**Mechanical Trt.**		**Biological Trt.**	
(insert more rows as needed)	Total Area (ha)	Total # sites	Total Area (ha)	Total # sites	Total # releases	Total # sites
City of Courtenay - Knotweed	2.5	33				
City of Courtenay - G. Hogweed			0.02	6		
CVRD - Knotweed	11	84				
CVRD - G. Hogweed			0.02	10		
Village of Cumberland - Knotweed	2.7	30				
Village of Cumberland – G. Hogweed			0.002	2		
Town of Comox - Knotweed	1.2	10				
Town of Comox - Knotweed			0.002	2		
Morrison Creek - yellow flag-iris			1.0200	2		
Area 6: Courtenay River Estuary - yellow flag-iris, purple loose-strife			21.0001	3		
Area 2: Courtenay River Slough - purple loose-strife			7.3600	1		
Area 3: Millard Creek/Airpark - yellow flag-iris, purple loose-strife			0.0011	2		
Area 5: Tsolum River - yellow			11.0500	3		

flag-iris, purple loose-strife						
Area 4: Courtenay River (walkway) - purple loose-strife			0.0241	7		
Argyle Road - purple loose-strife			1.0000	1		
Little River Nature Park - broom			1.0000	1		
Portuguese Creek – G. hogweed			2.4600	8		
Bear Creek Nature Park – G. hogweed			0.0008	1		
Ship Peninsula and Ships Point Parks – G. hogweed, vinca, ivy			0.0010	2		
Nob Hill Greenway - hogweed			0.0047	1		
Lazo Wildlife Park – yellow flag-iris			1.4000	1		
Ruth Masters Park – holly, ivy, vinca			0.6200	3		
Melda's Marsh - purple loose-strife			0.0001	1		
Harwood Estates – gorse, broom			0.4200	1		
Royston Seaside Trail – lamium, vinca			0.0100	1		
Seal Bay Park - holly			3.0000	15		
Glover Park - Ivy			0.0050	1		
Dyke Road Park – blackberry			0.1400	1		
One Spot Trail (Spike to Headquarters Road - broom			0.1200	1		
One Spot Trail (Macaulay Road) - broom			0.0750	1		
Tsolum River Commons – Canada thistle, oxeye daisy			1.000	1		
Public Roadsides (Denman Is.) - broom			22.4735	27		
Public and Private properties (Hornby Island) – daphne, bull thistle*1			19.84	5		
Totals:	17.4ha	157sites	94.0694ha	111sites		
Average cost of treatment/site*:	**$192.41*/site Chemical** *Coastal ISC only		**$267.09/site Mechanical** Does not include Coastal ISC = 192.41/site		$_____/site Biological	

Appendix C

Hardy Road parking area – Non-native invasive plant species removal cost comparison

Area of invasive material to be removed = 9400 m2

Assumptions:

- Mowable plant material = 8 metric tonnes (as per ISC conversation)
- Biomass sod layer = 470 cubic metres (based on sod layer being 2 inches thick)
- 1 cubic metre of biomass = 1.25 metric tonnes (based on loose moist soil conversion)
- Amount of invasive material (plant and biomass) = 8 + 588 = 596 metric tonnes
- Dump truck capacity = 8.5 cubic metres
- Each load would require an hour of trucking at a rate of $105/hour.
- Landfill disposal fee = $65/metric tonne

Treatment Comparison Table – Projected Costs

Treatment	**Projected Cost**					**Totals**
	Application	Mow Plant Material	Scrape Biomass	Trucking (approx. 60 loads)	Landfill Charge	
Mechanical	0	$1500	$6000	$6300	$38,740	$52,540
Chemical	$1016.50	$1500	$6000	$0	$0	$8,516.50

Notes:

- Transport of invasive material off-site has inherent risk of spreading the invasive and creating new infestations. Best management practices would suggest the material being removed off-site should be bagged, but given the volume of material this would be impractical.
- The treated material could be left on-site to decompose. Leaving the material onsite reduces the risk of spreading.