

2006 Invasive Plant Program Chemical Treatment Summary, Okanagan Region

FOR

Ministry of Transportation and Ministry of Environment



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1 Introduction

Invasive plants can be found throughout the Okanagan Region, introduced by travel, trade, gardening and agricultural practices. Non-native species introduced to the area are free of the natural predators and pathogens that would otherwise keep their populations in check in their natural habitats. The often aggressive and competitive nature of invasive plant species makes them difficult to control, and often results in the displacement of natural plant communities and disruption of natural ecosystem functions. Invasive plants of concern to the Okanagan Region may or may not be designated as noxious weeds under the *BC Weed Control Act*.

This is the first year a co-ordinated effort was made between the Ministry of Transportation (MoT) and Ministry of Environment (MoE) to address invasive plants along transportation corridors adjacent to and within provincial parks, protected areas and The Nature Trust Lands within the Okanagan Region. This joint effort was highly successful, resulting in the treatment of nineteen additional areas.

The Okanagan Region for each ministry has an approved Pest Management Plan (PMP). The PMP outlines problem weeds within the region, describes management initiatives, provides treatment options and strategies and outlines the treatment decision process. The majority of the treatments were completed with Tordon 22K. Vanquish, Grazon and Roundup were used in a limited number of situations, based on treatment objectives and site specific conditions.

A total of \$52,000 was spent on chemical treatments and \$13,000 on contract monitoring in the Okanagan Region this year. Of that, \$45,000 was contributed by MoT and \$20,000 by MoE. Funds were distributed as follows:

- \$26,000 on highways
- \$25,000 in parks protected areas and The Nature Trust Lands
- \$13,000 on contract monitor

MoE staff will complete the pesticide use report as required under the PMP and all treatment records and spatial data will be entered into the Ministry of Forests and Range Invasive Alien Plant Program (IAPP) database.

2 Okanagan Region Invasive Plant Strategy

It is the Environmental Stewardship Division's (ESD) mission to maintain and restore the natural diversity of provincial ecosystems and fish and wildlife species and their habitat; and to provide park, fish and wildlife recreation services and opportunities to British Columbians and visitors. Designing and implementing an effective Invasive Plant Program within the Okanagan Region is critical in fulfilling this mission and to ensure the long-term protection of our natural spaces.

The Okanagan Region's Invasive Plant Strategy was updated in 2006. This document outlines the programs strategic goals and prioritizes areas for treatment using the *Decision Tool to Prioritize Invasive Plant Program Projects*. These areas were initially selected based on existing conservation values, risk or threat of invasive plant establishment, priority invasive plant species and/or wildfire disturbance. Once priority areas were determined, inventory and treatment (chemical, mechanical and biological) projects were selected and implemented to meet Strategic Goals.

2.1 Okanagan Region Invasive Plant Program Budget

Table 1. Program budget including sources of funds, amounts and projects completed.

Project	Funding Source/Partnership	Date of Implementation	Project Details	Location	Total Cost 2006	Comments
Mechanical Control	Ministry of Environment The Nature Trust of BC	April-October 2006	Mechanical control	Okanagan Region	\$10,000.00	2005 funds
Chemical Control	Ministry of Environment: Regional Base Budget	June-October 2006	Spot-treatment of invasive plants throughout the Okanagan Region	Okanagan Region	\$7,000.00	Contractor: DJ Silviculture
	Ministry of Environment: Regional Base Budget	June-October 2006	Chemical treatment contract monitor	Okanagan Region	\$13,000.00	Contractor: Stewart Craig
	Ministry of Transportation	June-October 2006	Spot-treatment of invasive plants throughout the Okanagan Region	Okanagan Region	\$45,000.00	Contractor: DJ Silviculture
Inventory	Ministry of Environment: Regional Base Budget	August-October 2006	Inventory completed for all invasive plant species in 11 protected areas	Okanagan Region	\$22,000.00	Contacto: Wade Alcock
Data entry into IAPP application	Ministry of Environment: Regional Base Budget	October-March 2006	Enter all 2006 invasive plant data into the IAPP application	Okanagan Region	\$5,000.00	Auxiliary hire
TOTAL IP Program Costs - 2006					\$102,000.00	

2.2 Chemical Treatment Workplan

Table 2. Workplan for all chemical treatment operations completed under both the MoE and MoT Pest Management Plans.

2006 CHEMICAL CONTROL WORKSHEET FOR CONTRACTOR					
Date: July 4, 2006					
BCPARKS AREA	HWYS & PP/PA/ER/WMA/TNT	Number of Days Req'	Invasive Plant Species	Prescription	Timing
S	SOG - Kilpoola North - Hwy 3, Osoyoos	1	sulphur cinquefoil	Spot-treat sulphur cinquefoil	June
S	HWYS - WLGL Lot 106 (Orofino) - Willowbrook	1		As per MOT PMP	
S	WLGL - Lot 106 (Orofino) - Willowbrook	2	Russian thistle	Spot-treat Russian thistle rosettes	June
S	WLGL - Macdonald Dam - Willowbrook	1	sulphur cinquefoil	Spot-treat sulphur cinquefoil	cattle in till July 10
S	HWYS - WLGL Old Equestrian & Scout Camp / WHWO Site #1 - Willowbrook	0.5		As per MOT PMP	
S	WLGL - Old Equestrian Area/Boy Scout Camp Area / WHWO Site #1 - Willowbrook	2	sulphur cinquefoil	Spot-treat sulphur cinquefoil; find out who is responsible for gasline treatments	June/September, cattle in WHWO Site 1 till July 10
S	HWYS - WLGL Seacrest Area - Willowbrook	0.5		As per MOT PMP	
S	WLGL - Seacrest Area - Willowbrook	1	sulphur cinquefoil	Monitor 2003/2004/2005 treatments (sulphur cinquefoil) and spot-treat as necessary	June/September
S	HWYS - Haynes Lease Eco Reserve - Black Sage Road, Osoyoos	1		As per MOT PMP	
S	HWYS - South Okanagan Wildlife Management Area - SOWMA - Osoyoos	2		As per MOT PMP	
S	HWYS - TNT- Schneider - Allendale Lk Rd, OK Falls	0.5		As per MOT PMP	
S	TNT - Schneider - Allendale Lk Rd, OK Falls	3	sulphur cinquefoil	Treat sulphur cinquefoil with Tordon 22K (continue with historical treatments - monitor for effectiveness)	June/September, no grazing cattle

S**	TNT - Brock - Allendale/Oliver Ranch Road, OK Falls - (Upper Restoration Area) - Invoice TNT separately VFRDP HCTF funding - Rose/Sara/Carl will attend treatments	0.5	sulphur cinquefoil	Spot treat sulphur cinquefoil (outside of experimental plots) approximately 10m around plots.	June/September
S**	TNT - Brock - Allendale/Oliver Ranch Road, OK Falls - (Upper Restoration Area) - Invoice TNT separately VFRDP HCTF funding - Rose/Sara/Carl will attend treatments	0.5	All invasive plant species	Complete any treatments as recommended by Lynn Atwood and Rose Gunoff. Treat roadway up to powerline and the trail to the upper bench area.	June/September
S	HWYS - TNT - Wainwright - Newton Road, Cawston	0.5		As per MOT PMP	
S	HWYS - TNT - Skaha Eastside, Eastside Rd - Penticton/OK Falls	0.25		As per MOT PMP	
S	HWYS - TNT - Thomas McLean Crk - OK Falls	1		As per MOT PMP	
S	HWYS - TNT - Sublot 3 & 35 - Hwy 97, Vaseux	0.5		As per MOT PMP	
S	HWYS - TNT - Sublot 15 - Hwy 97, Vaseux	0.5		As per MOT PMP	
S	HWYS - TNT - Emery - Hwy 97, Vaseux	0.5		As per MOT PMP	
S	HWYS - TNT - Franmar - Hwy 97, Vaseux	0.5		As per MOT PMP	
S	CANCELLED - HWYS - TNT - Green Lake Road - OK Falls	0.5	CANCELLED - THIS AREA SCHEDULED TO BE TREATED BY MOT CONTRACTOR	CANCELLED - THIS AREA SCHEDULED TO BE TREATED BY MOT CONTRACTOR	
E	HWYS - Boundary Creek - 4K west of Greenwood, 9K east of Midway	1		As per MOT PMP	
E	Boundary Creek - 4K west of Greenwood, 9K east of Midway	3	spotted knapweed, hound's-tongue	Spot treat knapweed and hound's-tongue rosettes after mechanical control is completed	July
E	HWYS - Kettle River PP - 5K north of Rock Creek	1		As per MOT PMP, Barb Steward requests leafy spurge and scentless camomille be treated along this portion of the Kettle River Hwy R/W.	

E	Kettle River PP - 5K north of Rock Creek	1	sulphur cinquefoil, common anchusa, leafy spurge	Spot-treat SC and common anchusa along the KVR and trails; spot-treat leafy spurge along fenceline near hwy 33 (in coordination with Barb Stewart); monitor and follow-up 2003/2004 treatments; re-inventory park focusing on Eastern boundary <i>* This site is high priority - only leafy spurge and common anchusa infestations in the Region and they are both very small; coordinate with Barb Stewart</i>	June/September
E	HWYS - Okanagan Mountain PP - Kelowna	1		As per MOT PMP	
E	Okanagan Mountain PP - Kelowna and Gemmill Lake Area	2	diffuse knapweed, sulphur cinquefoil, St.John's-wort	Monitor 2005 treatment and re-treat as necessary (Lakeshore Parking Lot spot-spray sulphur cinquefoil down to the lake and up along the trail to Deeper Creek)	June/September
			tansy ragwort	Continue 2004/2005 control (mechanical and chemical) program for tansy ragwort (coordinate with SOSIPS fire task team); prioritize isolated infestations	June/September
E	CANCELLED - HWYS - Johnstone Creek - Hwy 3, 5K west of Rock Creek	0.5	CANCELLED - THIS AREA SCHEDULED TO BE TREATED BY MOT CONTRACTOR	CANCELLED - THIS AREA SCHEDULED TO BE TREATED BY MOT CONTRACTOR	
E	HWYS - Christina Lake - Christina Lake	0.5		As per MOT PMP	
E	HWYS - Gladestone - NE Grand Forks	1		As per MOT PMP	
E	Myra-Bellevue PP	0.5	sulphur cinquefoil, diffuse knapweed	as per ranger inventory	
N	HWYS - Campbell Brown ER - 5K north of Oyama, W side of Kal Lake	0.5		As per MOT PMP	
N	Campbell Brown ER - 5K north of Oyama, W side of Kal Lake	2	All species		
N	HWYS - Ellison PP - OK Landing, Vernon	0.5		As per MOT PMP	
N	Ellison PP - OK Landing Road, Vernon	2	sulphur cinquefoil	Treat sulphur cinquefoil along old access roads and trails as completed 2003-2005	June/September
N	HWYS - Kalamalka Lake - Vernon	2		As per MOT PMP	
N	Kalamalka Lake PP - Vernon	2	scotch thistle, rush skeletonweed (if found), leafy spurge (if found)	Mechanically control mature scotch thistle to reduce seed production; spot-spray scotch thistle rosettes a (use mechanical control methods if in pesticide free zone)	June/September

			sulphur cinquefoil	Draw containment line(s) and only treat sulphur cinquefoil "outside" of the containment line to reduce spread into uninfested areas	June/September
			scotch thistle	Go over previously treated area to ensure no scotch thistle missed	
N	HWYS - Kekuli PP - Hwy 97, Vernon	2		As per MOT PMP	
N	HWYS - Silver Star - Silver Star Road, Vernon	2		As per MOT PMP	
N	Vance Creek ER	0.5	sulphur cinquefoil	treat locations as per ranger inventory	
C	HWYS - Bear Creek PP - Westside Road, Kelowna	1		As per MOT PMP	
C	Bear Creek PP - Westside Road, Kelowna	1	sulphur cinquefoil	Assess historical treatment effectiveness and recommend treatments for 2006-2007	June/September
C	HWYS - Fintry PP - Westside Road, Kelowna	1		As per MOT PMP	
C	Fintry PP - Westside Road, Kelowna	1	diffuse knapweed	Spot-spray diffuse knapweed rosettes around groupsite and trails	June/September
C	HWYS - Trepanier - Trepanier Bench Road, Peachland	1		As per MOT PMP	
C	Trepanier - Trepanier Bench Road, Peachland	1	sulphur cinquefoil	Spot-spray sulphur cinquefoil (see 2005 treatment) along trail	June/September
C	HWYS - Okanagan Lake, Hwy 97, Summerland	1		As per MOT PMP	
C	HWYS - TNT - Trust Creek, Naramata Road, Naramata	0.5		As per MOT PMP	
W	HWYS - Manning PP - Hwy 3, Princeton	3		As per MOT PMP	
W	HWYS - Stemwinder PP - Hwy 3, Hedley	0.5		As per MOT PMP	
W	HWYS - Bromley PP - Hwy 3, Princeton	0.5		As per MOT PMP	
W	HWYS - Allison PP - Hwy 5A - 28K north of Princeton	0.5		As per MOT PMP	
W	HWYS - Otter Lake PP - Hwy 5A, 33K north of Princeton	0.5		As per MOT PMP	
W	HWYS - Kentucky-Aleyne PP - Hwy 5A, 38 km south of Merritt or 11 km south of Aspen Grove, just off Hwy 5A	1		As per MOT PMP	

3 Summary of Chemical Control Activities

3.1 Contract Monitor

The services of SMC Consulting were acquired to monitor the chemical treatments conducting by DJ Silviculture. SMC Consulting was responsible for conducting on-site inspections for each treatment completed by the pesticide applicator including aspects such as signage, herbicide use.

SMC Consulting ensured that DJ Silviculture was posting signs advising of the treatments at visible access points to the treatments areas where pedestrian traffic was likely to occur. The signs were required to be maintained for a minimum of two weeks following the treatment and included information such as:

- Name of the plan holder;
- Plan number;
- Purpose of the herbicide use;
- Trade and common name of herbicide used;
- Date(s) of herbicide application; and
- Telephone number of plan holders office.

The contract monitor verified that herbicide application was being carried out by or under the direct supervision of an individual with a valid BC pesticide applicator certificate in the Industrial Vegetation/Noxious Weed category. The monitor also checked for the following details:

- No herbicide shall be applied within 30 meters of domestic water intakes or wells.
- With the exception of glyphosate (see Active Ingredient Specific Standards), a 10 meter pesticide-free zone shall be maintained along all water bodies.
- Applicators shall provide adequate buffer zones to ensure that the 10 meter pesticide-free zone is maintained.
- All use of herbicides shall be carried out using ground operated low nozzle pressure (less than 300kPa) application equipment.
- Release sites of biological weed control agents shall be determined and avoided during herbicide application.
- Herbicide shall be applied on a spot-treatment only basis to weeds designated as noxious under the BC Weed Control Act. For the purposes of the two PMP's, spot treatment includes treatment of an area up to 1.5 meters in radius around each noxious weed for seed source control.
- Appropriate precautions shall be taken to ensure that herbicides are used in a manner that will not result in contamination of aquifers, damage non-target plant species or to the contamination of soil used for agricultural crop production, gardening or landscaping purposes.

Adherence by DJ Silviculture to specific operating standards for restrictions on use of picloram (Tordon 22K) and glyphosate (Roundup) in riparian areas and aquatic ecosystems were monitored by SCM Consulting. The contract monitor also ensured that data sheets were being filled out correctly and in a timely manner.

The inspection report form used through out the treatment program was developed by SCM Consulting. The form included information such as:

- Name of on-site supervisor and applicators
- Assessment of equipment condition and calibration history
- Use of protective equipment, availability of first aid supplies and a spill plan on-site
- Adherence to procedures for herbicide transport, storage, mixing, loading and application
- Environmental protection procedures in place
- Completion of weather monitoring

An example of the monitoring form used is included in appendix 1

Table 3. Works completed by the chemical treatment contract monitor.

<i>Ministry of Transportation</i>					
Region	Area	Dates	Days	Value	
North	Campbell Brown ER	June 26 to August 31	2.00	\$1,064.00	
	Kalamalka Lake PP				
	Kekuli PP				
	Silver Star PP				
	Ellison PP	September 1 to 19	0.50	\$266.00	
East	Boundary Creek PP	June 26 to August 31	2.00	\$984.00	
	Kettle River PP				
	Johnstone Creek PP				
	Christina Lake PP				
	Gladstone PP				
		June 26 to August 31	0.50	\$266.00	
South	Lot 106 (Orofino)	June 26 to August 31	2.00	\$784.00	
	Scout Camp/Old Equestrian Area				
	WLGL Seacrest/Willowbrook				
		SOWMA	June 26 to August 31	2.00	\$858.00
		Black Sage Rd/Haynes Lease ER			
		TNT Schneider/Allendale Road			
		Newton Road	June 26 to August 31	3.00	\$1,176.00
		Skaha Eastside Road			
		Thomas/McEan Creek Road			
		Vaseux/Sublot 3 and 35			
		Vaseux/Sublot 15			
		Vaseux/Emery			
		Vaseux/Franmar			
West	Manning PP	June 26 to August 31	4.00	\$2,128.00	
	Stemwinder PP				
	Bromley Rock PP				
	Allison Lake PP				
	Otter Lake PP				
	Kentucky-Alleyne PP				
Central	Bear Creek PP	June 26 to August 31	1.00	\$429.00	
	Fintry PP				
	Trout Creek	September 1 to 19	0.33	\$141.57	
	Okanagan Lake PP/Hwy 97	September 1 to 19	0.33	\$141.57	
	Trepanier PP	September 1 to 19	0.50	\$214.50	
MoT TOTAL			18.16	\$8,452.64	
<i>Ministry of Environment</i>					
Region	Area	Dates	Days	Value	
North	Campbell Brown ER	June 26 to August 31	2.00	\$1,064.00	
	Kalamalka Lake PP				
	Kekuli PP				
	Silver Star PP				
	Ellison PP				
		September 1 to 19	0.50	\$266.00	
East	Boundary Creek PP	June 26 to August 31	0.50	\$246.00	
	Kettle River PP				
	Okanagan Mountain PP				
South	Lot 106 (Orofino, Willowbrook)	June 26 to August 31	2.50	\$980.00	
	Scout Camp/Old Equestrian Area				
	Seacrest Area				
		SOG Kipoola North	June 26 to August 31	1.00	\$429.00
		TNT Schnieder	June 26 to August 31	1.00	\$392.00
		WLGPA/MacDonald Dam	September 1 to 19	1.00	\$392.00
Central	Bear Creek PP	June 26 to August 31	1.00	\$429.00	
	Fintry PP				
	Trepanier PP				
		September 1 to 19	0.50	\$214.50	
MoE TOTAL			10.25	\$4,510.50	

3.2 Pesticide Applicator

DJ Silviculture completed all chemical treatments for the Okanagan Region Invasive Plant Program and MoT works. In summary, **25.54 hectares** were spot-treated with **66.631L** herbicides at a cost of \$50,674.39.

- 60.031L of Tordon 22K/14.41kg of picloram (Tordon 22K active ingredient).
- 4.000L of Grazon/1.99kg triclopyr/picloram (Grazon active ingredients).
- 0.100L of Roundup/0.041kg glyphosate (Roundup active ingredients).
- 2.500L of Vanquish/1.205kg dicamba (Vanquish active ingredients).

The following tables summarize the areas treated and costs for treatments. A complete chemical summary is included in appendix 2.

Table 4. Timing, target species and value of chemical treatment activities completed.

Ministry of Transportation						
Region	Area/Park	Date	Species	Prescription	Hours	Value
North	Ellison Rd	14-Jul-06	all species present	as per MOT PMP	1.0	\$318.75
	Silver Star Road	19-Jul-06	all species present	as per MOT PMP	3.5	\$831.25
	Kal Park Road	19-Jul-06	all species present	as per MOT PMP	3.0	\$637.50
	Hwy 97/Kekuli PP	19-Jul-06	all species present	as per MOT PMP	10.0	\$1,781.25
	Kal Park Road	20-Jul-06	all species present	as per MOT PMP	2.5	\$796.87
East	Hwy 3/Gladstone/Christina Lake	17-Jul-06	all species present	as per MOT PMP	8.5	\$2,018.75
	Hwy 3/Boundary Creek	18-Jul-06	all species present	as per MOT PMP	2.0	\$475.00
	Hwy 3/Johnstone Creek	18-Jul-06	all species present	as per MOT PMP	2.0	\$475.00
	Hwy 33/Kettle River PP	18-Jul-06	all species present	as per MOT PMP	2.5	\$593.75
	Hwy 97/Okanagan Mt PP	29-Aug-06	all species present	as per MOT PMP	3.0	\$356.25
South	Lot 106 (Orofino)	4-Jul-06	all species present	as per MOT PMP	8.0	\$1,984.00
	Black Sage Rd/Haynes Lease ER	6-Jul-06	all species present	as per MOT PMP	5.0	\$1,240.00
	Meadowlark Rd	7-Jul-06	all species present	as per MOT PMP	8.0	\$1,984.00
	WLGL Seacrest/Willowbrook	10-Jul-06	all species present	as per MOT PMP	3.5	\$997.50
	TNT Allendale Rd/ Schneider	11-Jul-06	all species present	as per MOT PMP	1.5	\$178.12
	TNT McLean Crk Rd/ Thomas	12-Jul-06	all species present	as per MOT PMP	9.5	\$1,692.18
	Hwy 97/Vaseux Lake	13-Jul-06	all species present	as per MOT PMP	5.0	\$1,550.00
West	Hwy 3/Manning	17-Jul-06	all species present	as per MOT PMP	12.0	\$3,562.50
	Hwy 3/Bromly Rock	18-Jul-06	all species present	as per MOT PMP	7.0	\$1,246.87

	PP/Stemwinder PP					
	Otter Lk/Kentucky-Alleyne Rd	18-Jul-06	all species present	as per MOT PMP	9.0	\$1,068.75
Central	Westside Rd/Fintry PP	20-Jul-06	all species present	as per MOT PMP	2.0	\$712.50
	Westside Rd/Bear Creek PP	21-Jul-06	all species present	as per MOT PMP	5.0	\$593.75
	Trepanier Bench Rd/Trepanier PP	29-Aug-06	all species present	as per MOT PMP	4.0	\$475.00
	TNT Naramata Rd/ Trust Crk	29-Aug-06	all species present	as per MOT PMP	3.5	\$415.62
MoT Chemical Treatment TOTALS					121.0	\$25,985.16
Ministry of Environment						
Region	Area/Park	Date	Species	Prescription	Hours	Value
North	Ellison PP	14-Jul-06	Sulphur cinquefoil	treat along old access roads and trails	8.5	\$2,709.37
	Kal Lake PP	19-Jul-06	Scotch thistle	spot spray scotch thistle rosettes	4.5	\$956.25
	Campbell Brown ER	21-Jul-06	Sulphur cinquefoil	treat as per ranger inventory	2.0	\$212.50
	Silver Star PP (Vance Creek ER)	11-Oct-06	Sulphur cinquefoil	treat as per ranger inventory	4.5	\$801.56
	Kal Lake PP	11-Oct-06	Scotch thistle	retreat previous areas	2.5	\$398.43
East	Kettle River PP	18-Jul-06	Sulphur cinquefoil, common anchusa, leafy spurge	SC and CA along KVR and trails; LS along fence line	2.0	\$475.00
	Boundary Creek PP	18-Jul-06	Spotted knapweed, hound's tongue	spot treat after mechanical control is completed	2.0	\$475.00
	Okanagan Mt PP	31-Aug-06	Tansy Ragwort	continue 2004/2005 program; prioritize isolated infestations	10.0	\$1,062.50
	Okanagan Mt PP	1-Sep-06	Diffuse knapweed, sulphur cinquefoil, St. John's wort	retreat 2005 areas as necessary	10.0	\$1,062.50
	Okanagan Mt PP	11-Oct-06	Tansy Ragwort	continue 2004/2005 program; prioritize isolated infestations	6.0	\$637.50
	Myra Belleveu PP	12-Oct-06	Sulphur cinquefoil	treat as per ranger inventory	7.0	\$743.75
South	WLGL - Lot 106 (Orofino)	5-Jul-06	Russian thistle	spot treat rosettes	8.0	\$1,984.00
	SOG - Kilpoola North	6-Jul-06	Sulphur cinquefoil	spot treat	3.5	\$798.00
	WLGL - Old Equestrian area	8-Jul-06	Sulphur cinquefoil	spot treat	6.0	\$1,488.00
	WLGL - Seacrest/Willowbrook	10-Jul-06	Sulphur cinquefoil	spot treat as necessary	4.5	\$1,282.50
	WHWO Site #1 - Willowbrook	20-Jul-06	Sulphur cinquefoil	spot treat	12.0	\$1,488.00
	WHWO Site #1 - Willowbrook	10-Oct-06	Sulphur cinquefoil	spot treat	4.5	\$558.00
	Haynes Lease ER	10-Oct-06	Puncture vine	spot treat	3.0	\$372.00

	Schneider-Allendale subplot 3/35	11-Jul-06	Sulphur cinquefoil	continue with historical treatments; monitor for effectiveness	9.0	\$2,671.87
Central	Fintry PP	20-Jul-06	Diffuse knapweed	spot spray rosettes around group site and trails	2.0	\$712.50
	Bear Creek PP	21-Jul-06	Sulphur cinquefoil	assess historical treatment effectiveness and recommend treatments for 2006-2007	10.0	\$1,187.50
	Fintry PP	21-Jul-06	Diffuse knapweed	spot spray rosettes around group site and trails	7.5	\$1,781.25
	Trepanier PP	29-Aug-06	Sulphur cinquefoil	spot spray along trails; see 2005 treatment	7.0	\$831.25
MoE Chemical Treatment TOTALS					136.0	\$24,689.23

4 Summary of Mechanical Control Activities

Table 5. Location and prescription for control activities completed by The Nature Trust Lands BC Conservation Crew.

TNT Crew Schedule

PP/PA/ER	Management Strategy	Management Method	Involvement	Number of Days Req'	Invasive Plant Species	Prescription
Cathedral	Control/Contain	Mechanical	TNT Crew (Rangers?)	2	burdock	Control burdock throughout Lakeview campground area including around facilities, trail head (bridge) and access road as well as between parking lot and road/river
Cathedral	Control/Contain	Mechanical	TNT Crew	1	All invasive plant species	Along Ewert Creek access road and up trail from bridge; Mechanically control all invasive plant species around Buckhorn Campground
Hayne's Lease ER	Control	Mechanical	TNT Crew	2	puncturevine	Pull and bag puncturevine throughout ecological reserve
Mahoney ER	Control	Mechanical	TNT Crew	2	sulphur cinquefoil, bull thistle, blueweed, Russian knapweed	Hand-dig/cut all weed species (except Dalmatian toadflax and Canada thistle due to biological control agents released) around Mahoney Lake (follow-up 2003/2004/2005 treatments)
WLGL - Macdonald Dam & other site identified by Wade	Eradicate	Mechanical	TNT Crew	1	blueweed; hound's-tongue	Hand-dig/pull; cut/bag old hound's-tongue seeds
WLGL - McIntyre Bluff	Control/Contain	Mechanical	TNT Crew	1	All invasive plant species within PFZs	To be determined onsite
McIntyre (TNT Property)	Unknown	Inventory	TNT Crew	1	sulphur cinquefoil	Re-inventory and treat sulphur cinquefoil with Tordon 22K
WLGL - Old Equestrian Area/Boy Scout Camp Area	Control/Contain	Mechanical	TNT Crew	2	burdock, Canada thistle	Cut burdock; hand-cut Canada thistle flowers to reduce seed spread
WLGL - Lot 106 (Orofino)	Control/Contain	Chemical	TNT Crew	3	Russian thistle	remove dead plants/plant parts from site or burn
Hayne's Point PP	Contain	Mechanical	TNT Crew	1	Russian thistle, baby's breath, Russian knapweed	Bag Russian thistle plants containing seeds and pull all plants found; dig baby's breath throughout PP; cut Russian knapweed prior to seed seed (weed whack) *leave Canada thistle as there is a biorelease there...
Okanagan Mtn PP	Control/Contain	Mechanical	TNT Crew	2	tansy ragwort	PFZ areas as identified by Senior Ranger
TOTAL DAYS				19		
TOTAL COST (\$440/day)					\$8,360.00	

5 Summary of Biological Control Activities

Biological control agents were released in:

- Haynes Point PP (Canada thistle)
- Mahoney Lake ER (Canada thistle)
- Myra Bellevue PP (Dalmatian toadflax)
- White Lake Grassland PA (Diffuse knapweed)
- Anarchist PA (Diffuse knapweed)
- Okanagan Mountain PP (Diffuse knapweed)
- Chopaka West (Diffuse knapweed)
- Cathedral PP (Hound's tongue)

In total, 11 biological control releases (3800 biological control agents) were completed in the Okanagan Region:

- *Larinus planus*-2 releases of 200 (400 agents)
- *Mecinus janthinus*-2 releases of 400 (800 agents)
- *Cyphocleonus achates*-2 releases of 200, 1 release of 400 (800 agents)
- *Larinus minutus*-3 releases (1700 agents)
- *Mogulones cruciger*-1 release of 100 agents

Table 6. Locations for biological agent releases and number of agents released.

Invasive Plant Species	PP/ER/PA (actual)	Biological Control Agent	# of agents/ release	# of releases	Release Site Description
Canada thistle	Haynes Point PP	<i>Larinus planus</i>	200	1	South of Wetland Loop Trail
	Mahoney Lk ER	<i>Larinus planus</i>	200	1	South of Green Lk Rd towards Mahoney Lk
Dalmatian toadflax	Myra Bellevue PP	<i>Mecinus janthinus</i>	400	1	North of Stewart Rd East parking lot
	Myra Bellevue PP	<i>Mecinus janthinus</i>	400	1	South of Fortis Substation, Stewart Rd East
	Fintry PP	<i>Larinus minutus</i>	800	1	Parking area on road to campsites
Diffuse knapweed	WLGL - PA	<i>Larinus minutus</i>	500	1	Secret/Equestrian Area
	Anarchist PA	<i>Larinus minutus</i>	400	1	Southern Site
	Okanagan Mt PP	<i>Cyphocleonus achates</i>	200	1	Wildhorse Canyon Trail north of Goode Crk
	Okanagan Mt PP	<i>Cyphocleonus achates</i>	200	1	Wildhorse Canyon Trail south of Goode Crk
	Chopaka West	<i>Cyphocleonus achates</i>	400	1	West of Night Hawk Rd bw Hwy 3 and US Border
Hound's tongue	Cathedral PP	<i>Mogulones cruciger</i>	100	1	Lakeview Creek trailhead parking lot

6 Recommendations for 2007

- Continue with the chemical control treatment priorities which include those MoT lands adjacent to or within parks, protected areas and TNT lands
- Continue to engage a private contract monitor to conduct onsite reviews and reporting for duration of chemical treatment works
- Improve communications with MoT regarding treatment priorities in the south Okanagan to insure a more consistent approach as per MoE and South Okanagan Similkameen Invasive Plant Society (SOSIPS) priorities and actions (e.g. use of bioagents for Dalmation toadflax and other species instead of chemical treatment)
- Work to increase the participation of MoT in SOSIPS initiatives and the level of co-operation between the two groups
- Increase the joint review with MoT and Regions of workplan to ensure areas are within MoT PMP and if not develop a strategy to deal with those lands not included in the PMP (e.g. Manning PP not included in MoT PMP for Okanagan Region)
- Increase communication with MoT to more closely review chemical treatment areas and agency workplans to ensure no duplication of treatment (e.g. two contractors had Chute Lake Road on their workplan)

7 Appendix 1

Herbicide Inspection Report

Safety, Equipment and Environmental Protection

Dates of Inspections: _____ **Inspector:** _____

Location of Inspections _____

Licensee Undertaking Herbicide Applications: _____

On-Site Supervisor: _____ **Applicator Certificate: (#, Category and Expiry Date)** _____

Applicators Applying Herbicides: (Name, Certificate #)

Non-Applicators Applying Herbicides:

Copy of PMP and Confirmation on site: **YES** **NO**

Application Equipment: _____

Equipment Suitability and Condition:

Equipment Calibration History: _____

Applicators Knowledge of Herbicide Label Directions: _____

Protective Equipment Being Used: _____

Spill Plan in Place: **YES** **NO**

Supervisor Knowledgeable of Spill Response Procedures: **YES** **NO**

First Aid Equipment and Attendant: **YES** **NO**

First Aid Training: (List all qualified personnel and their qualifications): _____

Operational Information

Procedures for Herbicide Transport, Container and Spray Mix Disposal: _____

Herbicide Being Stored on Site (including mobile storage): **YES** **NO**

Details of Storage Facilities: _____

Procedures for Mixing, Loading and Applying Herbicides: **YES** **NO**

Describe Procedures: _____

Environmental Protection Procedures and Strategies

Describe Procedures for Locating Domestic and Agricultural Water Sources, Wells, Water Bodies and other Environmentally Sensitive Features Within 30 meters of Herbicide Use:

Will These Areas Be Identified Prior to Herbicide Use: YES NO

Procedures and Strategies Being Used for Their Protection: (flagged, staked, ribboned) _____

Applicators Aware of Procedures to be Followed: YES NO

Procedures and Strategies Being Used for Protection of Riparian Areas, Fish and Wildlife and Wildlife Habitat: _____

Applicators Aware of Procedures to be Followed: YES NO

Food Intended for Human Consumption Located within 30 meters of herbicide use YES NO

Procedures and Strategies Being Used for Their Protection: (flagged, staked, ribboned) _____

Applicators Aware of Procedures to be Followed: YES NO

Weather Monitoring Being Undertaken: YES NO

Describe Weather Monitoring Procedures Being Used: (What is being measured, How is it being measured and the frequency of monitoring) _____

Spray Records being Maintained in Compliance with the IPMR: **YES** **NO**

If NO, describe any deficiencies : _____

Treatment Area Boundaries Marking Procedures in Place: **YES** **NO**

Pre-Treatment Meeting Held with All Applicators: **YES** **NO**

Applicators Aware of the Requirements/Their Responsibilities Under the PMP, Integrated Pest Management Act and Regulations, other Applicable Legislation: **YES** **NO**

Describe any Deficiencies and What Must Be Done to Correct Them: _____

Additional Comments

Compliance with Treatment Notice Form/Content/Posting Requirements: YES NO

Describe Deficiencies: _____

Comments: _____

Compliance with PFZ and NTZ Requirements: YES NO

Describe Locations, How Identified, Deficiencies: _____

Comments: _____

Summary/Comments/Recommendations on the Results of Post-Treatment Inspection(s)

Photographs Attached: YES NO

8 Appendix 2

Product Name	Pesticide (AI)	Target Weed Species	Total Chemical Used (L)	Application Rate (L chemical/ha)	Quantity of AI Used (Kg)	Area Treated (ha.)	Date	Agency	Location of Treatment
Vanquish	dicamba	Russian Thistle; Diffuse Knapweed; Dalmation Toadflax; Houndstounge; Sulphur Cinquefoil; Puncture Vine	2.500 L	4.5	1.205	0.56 ha.	07-Jul-06	MoT	Meadowlark Road
Roundup	glyphosate	Russian Thistle; Diffuse Knapweed; Dalmation Toadflax; Houndstounge; Sulphur Cinquefoil; Puncture Vine	0.100 L	6	0.041	0.02 ha.	07-Jul-06	MoT	Meadowlark Road
Tordon	picloram	Russian Thistle; Diffuse Knapweed; Dalmation Toadflax; Houndstounge; Sulphur Cinquefoil; Puncture Vine	2.000 L	2.50	0.48	0.80 ha.	07-Jul-06	MoT	Meadowlark Road
Tordon	picloram	Russian Thistle; Knapweed	1.250 L	2.50	0.30	0.50 ha.	4-Jul-06	MoT	WLGL - Orofino - Willowbrook
Tordon	picloram	Russian Thistle; Diffuse Knapweed; Sulphur Cinquefoil; Puncture Vine	1.500 L	2.50	0.36	0.60 ha.	6-Jul-06	MoT	Hwys - Black Sage Rd

Product Name	Pesticide (AI)	Target Weed Species	Total Chemical Used (L)	Application Rate (L chemical/ha)	Quantity of AI Used (Kg)	Area Treated (ha.)	Date	Agency	Location of Treatment
Tordon	picloram	All noxious weeds	0.500 L	2.50	0.12	0.20 ha.	10-Jul-06	MoT	HWYS - WLGL - Seacrest, Old Equestrian & Boy Scout Camp
Tordon	picloram	All noxious weeds	1.000 L	2.50	0.24	0.40 ha.	11-Jul-06	MoT	HWYS - TNT - Schneider - Allendale Lk Rd
Tordon	picloram	All noxious weeds	2.000 L	2.50	0.48	0.80 ha.	12-Jul-06	MoT	HWYS - TNT - multiple sites
Tordon	picloram	All noxious weeds	3.000 L	2.50	0.72	1.20 ha.	13-Jul-06	MoT	Hwy #97 - Vaseaux Lk - Emery & Franmar
Tordon	picloram	Diffuse Knapweed; Houndstounge; Common Toadflax; Sulphur Cinquefoil	0.500 L	2.50	0.12	0.20 ha.	14-Jul-06	MoT	HWYS - Ellison PP
Tordon	picloram	Common Toadflax; Dalmation Toadflax; Yellow Toadflax; Spotted Knapweed; Diffuse Knapweed; Houndstounge	2.000 L	2.50	0.48	0.80 ha.	17-Jul-06	MoT	Manning Park - various sites
Tordon	picloram	Diffuse Knapweed; Spotted Knapweed; Dalmation Toadflax	1.000 L	2.50	0.24	0.40 ha.	17-Jul-06	MoT	Hwy #3 - Gladstone
Tordon	picloram	All noxious weeds	0.080 L	2.50	0.02	0.04 ha.	18-Jul-06	MoT	Hwy - Boundary Creek Provincial Park
Tordon	picloram	All noxious weeds	0.150 L	2.25	0.04	0.06 ha.	18-Jul-06	MoT	Hwy - Johnstone Creek Provincial Park
Tordon	picloram	All noxious weeds	0.180 L	2.25	0.04	0.08 ha.	18-Jul-06	MoT	Hwys - Kettle River Provincial Park

Product Name	Pesticide (AI)	Target Weed Species	Total Chemical Used (L)	Application Rate (L chemical/ha)	Quantity of AI Used (Kg)	Area Treated (ha.)	Date	Agency	Location of Treatment
Tordon	picloram	Sulphur Cinquefoil; Dalmation Toadflax; Diffuse Knapweed; Spotted Knapweed; Houndstounge; Common Toadflax	1.500 L	2.50	0.36	0.60 ha.	18-Jul-06	MoT	HWYS - Bromley Rock & Stemwinder Provincial Parks; TNT - Wainwright
Tordon	picloram	Diffuse Knapweed; Spotted Knapweed; Dalmation Toadflax; Houndstounge; Common Toadflax	1.150 L	2.50	0.28	0.46 ha.	18-Jul-06	MoT	Hwys - Otter Lake & Kentucky-Alleyne Provincial Parks
Tordon	picloram	All noxious weeds	0.330 L	2.25	0.08	0.15 ha.	19-Jul-06	MoT	Silver Star PP sign past Sovereign Lake turn off
Tordon	picloram	All noxious weeds	0.330 L	2.25	0.08	0.15 ha.	19-Jul-06	MoT	Silver Star PP sign past Sovereign Lake turn off
Tordon	picloram	All noxious weeds	0.540 L	2.25	0.13	0.24 ha.	19-Jul-06	MoT	Near Cousins Bay
Tordon	picloram	All noxious weeds	0.540 L	2.25	0.13	0.24 ha.	19-Jul-06	MoT	Near Cousins Bay
Tordon	picloram	All noxious weeds	3.500 L	2.50	0.84	1.40 ha.	19-Jul-06	MoT	Hwys - Kekuli Bay PP
Tordon	picloram	All noxious weeds	0.570 L	2.25	0.14	0.25 ha.	20-Jul-06	MoT	Westside Road - Fintry PP area
Tordon	picloram	All noxious weeds	0.450 L	2.25	0.11	0.20 ha.	20-Jul-06	MoT	Cousins Bay area
Tordon	picloram	All noxious weeds	0.450 L	2.25	0.11	0.20 ha.	20-Jul-06	MoT	Cousins Bay area
Tordon	picloram	All noxious weeds	0.570 L	2.25	0.14	0.25 ha.	20-Jul-06	MoT	Westside Road - Fintry PP area

Product Name	Pesticide (AI)	Target Weed Species	Total Chemical Used (L)	Application Rate (L chemical/ha)	Quantity of AI Used (Kg)	Area Treated (ha.)	Date	Agency	Location of Treatment
Tordon	picloram	All noxious weeds	0.500 L	2.50	0.12	0.20 ha.	21-Jul-06	MoT	Hwys - Bear Creek PP
Tordon	picloram	All noxious weeds	0.200 L	2.50	0.05	0.08 ha.	29-Aug-06	MoT	HWYS - TNT - Trust Creek
Tordon	picloram	All noxious weeds	2.000 L	2.50	0.48	0.80 ha.	29-Aug-06	MoT	Hwys - Trepanier PA
Tordon	picloram	All noxious weeds	1.500 L	2.50	0.36	0.60 ha.	29-Aug-06	MoT	Hwys - Okanagan Lk PP
Tordon	picloram	Russian Thistle	3.000 L	2.50	0.72	1.20 ha.	5-Jul-06	MoE	WLGL - Willowbrook/Oliver
Tordon	picloram	Sulphur Cinquefoil; Common Toadflax	0.500 L	2.50	0.12	0.20 ha.	5-Jul-06	MoE	SOG - Kilpoola North Site
Tordon	picloram	Sulphur Cinquefoil	1.500 L	2.50	0.36	0.60 ha.	8-Jul-06	MoE	WLGL - Boy Scout Camp/Old Equestrian
Tordon	picloram	Sulphur Cinquefoil	1.000 L	2.50	0.24	0.40 ha.	10-Jul-06	MoE	WLGL - Seacrest - Willowbrook
Tordon	picloram	Sulphur Cinquefoil	2.500 L	2.50	0.60	1.00 ha.	11-Jul-06	MoE	TNT - Schneider - Allendale Lk Rd
Tordon	picloram	Sulphur Cinquefoil; Diffuse Knapweed	4.000 L	2.50	0.96	1.60 ha.	12-Jul-06	MoE	TNT - Brock - Oliver Ranch Rd
Tordon	picloram	Sulphur Cinquefoil; Common Toadflax	1.200 L	2.50	0.29	0.48 ha.	14-Jul-06	MoE	Ellison PP
Tordon	picloram	Spotted Knapweed; Dalmation Toadflax	0.260 L	2.25	0.06	0.12 ha.	18-Jul-06	MoE	Kettle River PP
Tordon	picloram	Spotted Knapweed; Dalmation Toadflax	0.010 L	2.25	0.00	0.004 ha.	18-Jul-06	MoE	Boundary Creek PP

Product Name	Pesticide (AI)	Target Weed Species	Total Chemical Used (L)	Application Rate (L chemical/ha)	Quantity of AI Used (Kg)	Area Treated (ha.)	Date	Agency	Location of Treatment
Tordon	picloram	Scotch Thistle; Sulphur Cinquefoil	1.320 L	2.25	0.32	0.59 ha.	19-Jul-06	MoE	Kal Park - red gate
Tordon	picloram	Diffuse Knapweed	0.720 L	2.25	0.17	0.32 ha.	20-Jul-06	MoE	Fintry Provincial Park
Tordon	picloram	Sulphur Cinquefoil	2.500 L	2.50	0.60	1.00 ha.	20-Jul-06	MoE	WHWO #1 & Macdonald Rim
Tordon	picloram	Sulphur Cinquefoil	3.500 L	2.50	0.84	1.40 ha.	21-Jul-06	MoE	Bear Creek PP
Tordon	picloram	Sulphur Cinquefoil	0.420 L	2.25	0.10	0.19 ha.	21-Jul-06	MoE	Hwy 97 by Lake Country sign
Tordon	picloram	Diffuse Knapweed	1.800 L	2.25	0.43	0.80 ha.	21-Jul-06	MoE	Fintry Provincial Park
Tordon	picloram	Sulphur Cinquefoil; Diffuse Knapweed	1.500 L	2.50	0.36	0.60 ha.	29-Aug-06	MoE	Trepanier PA
Tordon	picloram	Sulphur Cinquefoil; Diffuse Knapweed; Tansy Ragwort; Common Toadflax	0.500 L	2.50	0.12	0.20 ha.	31-Aug-06	MoE	Okanagan Mtn Park (south)
Tordon	picloram	Sulphur Cinquefoil; Diffuse Knapweed; Common Toadflax	1.000 L	2.50	0.24	0.40 ha.	1-Sep-06	MoE	Okanagan Mtn Park (Wildhorse Canyon)
Tordon	picloram	Sulphur Cinquefoil	0.009 L	2.25	0.00	0.004 ha.	11-Oct-06	MoE	Kal Lake Park
Tordon	picloram	Sulphur Cinquefoil	0.002 L	2.25	0.00	0.001 ha.	11-Oct-06	MoE	Vance Creek ER
Tordon	picloram	Sulphur Cinquefoil	0.500 L	2.50	0.12	0.20 ha.	10-Oct-06	MoE	WHWO Site #1
Tordon	picloram	Puncture Vine	0.200 L	2.50	0.05	0.08 ha.	10-Oct-06	MoE	Haynes Lease ER - Black Sage Rd

Product Name	Pesticide (AI)	Target Weed Species	Total Chemical Used (L)	Application Rate (L chemical/ha)	Quantity of AI Used (Kg)	Area Treated (ha.)	Date	Agency	Location of Treatment
Tordon	picloram	Common Toadflax; Tansy Ragwort	0.300 L	2.50	0.07	0.12 ha.	11-Oct-06	MoE	Okanagan Mtn Park - Gemmill Lake
Tordon	picloram	Sulphur Cinquefoil; Diffuse Knapweed	2.500 L	2.50	0.60	1.00 ha.	12-Oct-06	MoE	Myra-Bellevue PP Access Rd
Grazon	triclopyr picloram	Sulphur Cinquefoil; Diffuse Knapweed; Tansy Ragwort; Common Toadflax	1.000 L	7.00	0.50	0.14 ha.	31-Aug-06	MoE	Okanagan Mtn Park (south)
Grazon	triclopyr picloram	Sulphur Cinquefoil; Diffuse Knapweed; Common Toadflax	3.000 L	7.00	1.49	0.43 ha.	1-Sep-06	MoE	Okanagan Mtn Park (Wildhorse Canyon)
		Totals	66.631 L		17.646 kg	25.54 ha			

9 Appendix 3

Attached: Letter from SMC Consulting re: recommendations for future contracts involving pot-treatment herbicide monitoring.