



**COLUMBIA SHUSWAP  
REGIONAL DISTRICT**

## **MILFOIL CONTROL PROGRAM**



**2011 PROGRAM**

## **INTRODUCTION**

The Columbia Shuswap Regional District (CSRD) and the Ministry of Environment, Lands and Parks entered into annual cost-shared Eurasian Water Milfoil (EWM) control programs in 1981 for the Shuswap Lake system. The cost-shared funding ratio from 1981 to 1992 consisted of 75% Provincial and 25% Regional contributions for the function. After 1992, the Provincial contributions towards the program costs diminished every year until 1999 when no funding was received from the Province. In the spring of 1999, all of the Province's contractual responsibility for milfoil control work in the Shuswap was severed when ownership of the milfoil control equipment was signed over to the Regional District. The original initiatives of the program focused on prevention of spread and limiting expansion of established weed beds. Over several years, fragment-carrying boat traffic and downstream spread of naturally occurring fragments from the Salmon Arm and Sicamous area resulted in weed beds becoming evident in the outer arms and adjacent water bodies. Intensive control techniques (i.e. diver dredging, bottom barrier) were replaced with less expensive and less effective semi-intensive control techniques (i.e. de-rooting, harvesting) due to expanding Milfoil populations and funding constraints. Historically, the majority of the milfoil control work has been performed in the Salmon Arm, Sicamous and Mara Lake areas. From 1996 to 2006, the volume of work and number of treatment sites in the outer Arms expanded significantly.

From 2006 to 2009, there were significant declines in the density and presence of milfoil in the Shuswap Lake system due to environmental influences. There are many factors that impact the growth (fluctuating water levels, lower water temperature, high turbidity, available sunlight, nutrient uptake, algae blooms, etc.) but one of the least understood is the cyclical variability of its growth. The Okanagan Valley water shed has witnessed significant fluctuations of Milfoil growth thought to be cyclical, as has many other jurisdictions. The specific cause of these fluctuations is not identified.

In response to declines in the density and related nuisance impact of EWM, the scope of work and program funding were reduced in 2010 and 2011.

## **WATER USE PRIORITIES**

The Columbia Shuswap Regional District's priorities for aquatic weed control work are based on specific activities as listed below:

### **First Priority**

- High Use Swimming Beaches (ex. Canoe Beach)
- High Traffic Boating Areas (ex. Sicamous Channel)
- Boat Launches (ex. to prevent spread into other lakes)
- High Use Recreation (ex. water skiing, etc.)

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**HARVESTING**

The 1979 Altosaur Aquatic Plant Harvester (harvester) was utilized between 4 and 7 days per week, 10 hours a day depending on nuisance plant removal demands. The total volume of plant biomass harvested in 2011 was 34.5 tonnes.

The total volume of plant biomass declined for the fifth consecutive year. Although the distribution of EWM in the Shuswap and Mara Lake systems remains relatively consistent, the overall density has declined significantly. The combination of a large snowpack in the Shuswap watershed and the cool wet spring delayed lake freshet. The result of high water levels later into the recreation season reduced the nuisance impact of milfoil into August. Ultimately, the required operating days and volume harvested were less than previous years.

In 2011, the harvester operated a total of 22 days, treating 26.4 ha (Table 1) between August 3 and September 8, 2011. The harvesting component of the program in this year totalled \$39,821.08.

The harvesting component of the Milfoil Control Program maintains an inventory of small hand tools available for loan out. The objective of providing specialised weed removal equipment on a free loan out program is to enable the public to manage small milfoil beds adjacent to their waterfront homes. This fulfills a gap in the level of treatment that the large floating weed harvesters are unable to treat. Positive feedback has been received from the residents that have taken advantage of the service.



**CRANE TRUCK LOADING HARVESTED MILFOIL**

## DEROOTING

The 2011 rototilling treatments were planned to be conducted at a reduced scope of work to address the declines in EWM growth and program funding.

The program utilised two Milfoil Rototilling Vessels (MRVs) - the *M.R.V. Shuswap* and the red rototiller D1. The *M.R.V. Shuswap* was commissioned in 1990 as a joint project with the Province. The *M.R.V. Shuswap* operated 24 days for ten hours (Table 2). The red rototiller D1 operated 26 days for ten hours (Table 2). Total area treated was 35.2 ha at a cost of \$92,542.65.



**THE 'M.R.V. SHUSWAP' MILFOIL ROTOTILLING VESSEL**

**SURVEILLANCE**

Personnel from the CSRD performed an aquatic plant survey within the CSRD boundary of Adams Lake and Gardom Lake in September of 2011. As in all previous surveys, no EWM was found.

A total of \$1,680.00 was expended for surveillance in 2011.



**EURASIAN WATER MILFOIL**

**PUBLIC INFORMATION & OUTREACH**

The inventory of EWM boat launch warning signs and displays were checked and maintained as required. Information on the Milfoil Control Program and Annual Reports are available online at the CSRD website at [www.csr.bc.ca](http://www.csr.bc.ca).

A presentation was made at the BC Lake Stewardship Society Conference at Gardom Lake in June.

Two roofed displays had updated signage installed and were repainted.

The total public information expense in 2011 was \$1,840.70.

**WHITE LAKE/BOTTOM BARRIER**

An intensive control treatment technique was implemented at two sites in 1994 when EWM was first identified in White Lake. In 1995, 1996 and 1997, continued bottom barrier and handpicking treatments were successful in eradicating the Milfoil sites. Subsequent SCUBA and surface surveys in 1998 through 2011 inclusive have been unable to find any EWM plants in White Lake. This is the first of the over 100 British Columbia lakes infested with EWM to have the plant population eradicated. Due to the close proximity of White Lake to Shuswap Lake, the probability of EWM fragments being re-introduced into White Lake in the future is very high.

There were no bottom barrier applications in 2011. The maintenance cost was \$380.00.

**TOTAL CAPITAL EXPENDITURES (TCA)**

Gentech Engineering Inc. conducted site survey work at the new milfoil storage yard at a cost of \$2,432.00.



**Eurasian Water Milfoil  
Control Program**

**2011 Program Results**

		<b>EXPENSES</b>				
		<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
<b>1.</b>	<b><u>Supervision and Field Administration</u></b>					
1.1	Supervisor wages and fringe	\$34,145.78	\$37,835.23	\$37,944.69	\$33,845.88	\$32,063.69
1.2	Vehicle/boat operation and repair	2,316.08	2,935.23	2,105.15	1,901.56	2,997.28
	<b>SUBTOTAL</b>	<b>\$36,461.86</b>	<b>\$40,770.46</b>	<b>\$40,049.84</b>	<b>\$35,747.44</b>	<b>\$35,060.97</b>
<b>2.</b>	<b><u>Surveillance and Monitoring</u></b>					
2.1	Wages and fringe	\$6,245.00	\$11,289.02	\$3,792.48	\$2,290.00	\$1,680.00
2.2	Vehicle/boat operation and repair	3,301.50	8,345.42	2,463.91	445.01	0.00
	<b>SUBTOTAL</b>	<b>\$9,546.50</b>	<b>\$19,634.44</b>	<b>\$6,256.39</b>	<b>\$2,735.01</b>	<b>\$1,680.00</b>
<b>3.</b>	<b><u>Public Information</u></b>					
3.1	Wages and supplies	\$2,433.18	\$734.34	\$834.81	\$974.64	\$1,840.70
<b>4.</b>	<b><u>Derooting</u></b>					
4.1	Wages and fringe	\$39,032.02	\$41,022.67	\$47,197.66	\$25,804.67	\$39,692.51
4.2	Vehicle/boat operation and repair	44,041.31	41,474.82	41,895.65	20,859.85	43,281.18
4.3	Shared maintenance (tracking)	17,647.34	19,865.74	23,827.93	3,596.21	2,280.13
4.4	Equipment transport	6,300.64	7,127.41	4,666.25	1,329.03	7,288.83
	<b>SUBTOTAL</b>	<b>\$107,021.31</b>	<b>\$109,490.64</b>	<b>\$117,587.49</b>	<b>\$51,589.76</b>	<b>\$92,542.65</b>
<b>5.</b>	<b><u>Harvesting and Spoils Disposal</u></b>					
5.1	Wages and fringe	\$35,177.08	\$34,493.12	\$37,753.88	\$20,885.05	\$34,250.47
5.2	Vehicle/boat operation and repair	59,469.16	34,581.59	2,9971.82	14,001.99	5,570.61
	<b>SUBTOTAL</b>	<b>\$94,646.24</b>	<b>\$70,074.71</b>	<b>\$67,725.70</b>	<b>\$34,887.04</b>	<b>\$39,821.08</b>
<b>6.</b>	<b><u>Bottom Barrier (White Lake)</u></b>					
6.1	Wages and fringe	\$529.67	\$297.98	\$480.00	\$635.70	\$380.00
6.2	Vehicle/boat operation and repair	310.21	1,027.51	81.13	98.99	0.00
	<b>SUBTOTAL</b>	<b>\$839.88</b>	<b>\$1,325.49</b>	<b>\$561.13</b>	<b>\$734.69</b>	<b>\$380.00</b>
<b>7.</b>						
7.1	Administration	\$10,665.00	\$9,263.00	\$8,313.00	\$7,000.00	\$16,550.00
7.2	Director's Remuneration	827.27	1,154.81	1,201.73	617.44	801.75
7.3	Insurance & I.C.B.C.	8,264.00	8,223.00	8,940.00	7,965.88	8,073.00
7.4	Occupational Health and Safety	142.92	0	0.00	0.00	0.00
7.5	Building and Grounds	3,149.85	2,084.60	2,265.12	3,175.74	2,837.94
7.6	Communication/Telephone	1,799.81	2,399.81	2,222.32	1,138.67	1,555.72
7.7	Miscellaneous	6.10	33.66	0.00	1,929.43	708.53
	<b>SUBTOTAL</b>	<b>\$24,854.95</b>	<b>\$23,158.88</b>	<b>\$22,942.17</b>	<b>\$21,827.16</b>	<b>\$30,527.99</b>
<b>8.</b>	<b><u>Capital Expenditures</u></b>	0.00	0.00	\$35,838.07	\$21,504.08	\$2,432.08
<b>9.</b>	<b><u>Reserve Contributions</u></b>	\$30,000.00	\$22,000.00	\$0.00	\$20,000.00	\$0.00
	<b>TOTAL</b>	<b>\$305,804.22</b>	<b>\$287,188.96</b>	<b>\$291,795.60</b>	<b>\$182,807.40</b>	<b>\$203,542.50</b>
	ANNUAL BUDGET	\$313,524.56	\$287,601.97	\$292,577.60	\$198,899.77	\$234,050.00
	BALANCE	\$7,720.34	\$413.01	\$782.00	\$16,092.37	\$42,499.00

\*\* Denotes contracted work and surplus TCA funds

**TABLE 1: HARVESTING TREATMENTS**

	Site		Priority	Fish Designation	Plant Species	2011 Treatment Information			
	No.	Location				ALTO days	Area (ha)	Objective	Previously Treated
MAIN ARM	202.8 - 203	Scotch Creek to Lee Creek	1 & 2	Sp/MRear	EWM	1	1.1	SNR	2010
	207 to 210	Cinnemousun to Wildrose Bay	1&2	LRear	EWM	1	1.0	SPNR	2010
	201 - 202.5	Anglemont/Magna Bay/Celista	1 & 2	Sp/LRear	EWM	1.5	2.8	SNR	2010
	203	Cottonwood Campground – Little River Boat World Lee Creek	1 & 2	Sp/LRear	EWM	1	1.4	SNR	2010
	203.2/203.3	Sorrento area	1 & 2	LRear	EWM	3	3.3	SNR	2010
	203.4 - 205	Blind Bay to Eagle Bay	1 & 2	MRear	EWM	1	1.1	SR	2010
MARA LAKE (CSRD)	400 - 403	Northwest Mara to Black Point S.	1 & 2	HRear	EWM	.5	1.0	RS	2010
	410 - 418	Rest Area and North Mara	1 & 2	HRear	EWM	.5	.7	RS	2010
	418	Swansea Pt	1	HRear	EWM	1	1.2	SRN	2010
SICAMOUS	601 – 617	Channel Entrance to Kappel St	1	Sp/HRear	EWM	2	1.8	SRN	2010
SALMON ARM	701 - 706	Canoe Point to Herald's Park	1 & 2	Sp/LRear	EWM	1	1.0	RS	2010
	709 - 711	Sunnybrae	1 & 2	Sp/LRear	EWM	2	2.4	RS	2010
	712 - 714	Sky Blue Waters to Fraser's Beach	1 & 2	LRear	EWM	.5	.7	RS	2010
	715 - 719	Glen Echo to Salmon Arm Bay Marina	1 & 2	LRear	EWM	2	2.5	SRN	2010
	721 - 724	Captains Cove to East of Canoe Mill	1 & 2	MRear	EWM	2	2.4	SRN	2010
	724.3 - 727	Canoe to Annis Bay	1 & 2	MRear	EWM	1	1.7	SR	2010
MARA LAKE (NORD)	405.8	Mara Provincial Park (under contract)	1 & 2	HRear	EWM	1	1.1	SNR	2010
<b>TOTALS</b>						<b>22</b>	<b>26.4</b>		

**ALTOSAUR HARVESTER: 22 DAYS 10 HOURS/DAY, AUG 3 - SEPT 8**

Fisheries Designations	Treatment Priorities	Objectives
<b>Sp</b> - shore spawning zones <b>HRear</b> - high use juvenile rearing zone <b>MRear</b> – moderate use juvenile rearing zone <b>LRear</b> - low use juvenile rearing zone	<b>1</b> - high use beaches, boating areas/launches <b>2</b> - high use recreational areas <b>3</b> - low use recreational areas	<b>S</b> - safety (swimming) <b>N</b> – navigation <b>R</b> – recreation

**TABLE 2: DEROOTING TREATMENTS**

	Site		Priority	Fish Designation	D1 Days	2011 Treatment Information			
	No.	Location				MRV Days	Area (ha)	Objective	Previously Treated
MARA LAKE (CSRD)	416	Legacy to Bald Street	2	LRear	0	2	1.7	SRN	2009
SICAMOUS	605.1 - 617.5	Sicamous Beach to Kappel St	1	HRear	10	8	5.2	SRN	2009
SALMON ARM	716.9	Sandy Pt to Gleneden	1	LRear	8	4	8.9	SR	2009 & 2010
	721 / 723 / 724.1	Captains Cove to Canoe Mill	1	MRear	1	4	6.7	SRN	2010
MARA LAKE (NORD)	405.1 TO 406	Mara Park to Crystal Sands Resort (under contract)	1 & 2	HRear	7	6	12.7	SNR	2009
<b>TOTALS</b>					<b>26</b>	<b>24</b>	<b>35.2</b>		

**D1: 26 DAYS 10 HOURS/DAY, OCTOBER 12 TO DECEMBER 8**  
**MRV: 24 DAYS 10 HOURS/DAY, OCTOBER 18 TO DECEMBER 8**

Fisheries Designations	Objectives	Treatment Priorities	Equipment
Sp - shore spawning zones HRear – high use juvenile rearing zone MRear – moderate use juvenile rearing zone LRear - low use juvenile rearing zone	S - safety (swimming) N - navigation R - recreation	1 - high use beaches, boating areas/launches 2 - high use recreational areas 3 - low use recreational areas	MRV - MRV Shuswap DI - Red Rototiller