



 Fisheries and Oceans Canada Pêches et Océans Canada

## 2008 Predator Control to Enhance Sockeye Salmon Freshwater Survival in Cultus Lake

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## Abstract

Adult northern pikeminnow (*Ptychocheilus oregonensis*) are a predator of the endangered juvenile sockeye salmon (*Oncorhynchus nerka*) in Cultus Lake. In an effort to reduce predation on the juvenile sockeye, a predator control program has been conducted in Cultus Lake in since 2005. In 2008, between May 1 and July 2, a small-mesh purse seine net was fished from a modified gillnetter. It captured 8 677 adult pikeminnow ( $\geq 200$  mm) and 3 667 juveniles. Seventy one percent of the adult catch was female. As in past years, the majority of the catch occurred in the northern portion of the lake, but this year there was also considerable catch in the southern end. The catch rate varied throughout the fishing period with the daily average ranging between 0 to 590 pikeminnow/set with an overall average of 57 pikeminnow/set . Catch rates declined from the beginning of the program to the end, peaking in early to mid June at 3 500 northern pikeminnow per day and 1845 on one set. The majority (70%) of the catch was in the adult category ( $\geq 200$  mm) although 3 667 juvenile pikeminnow were also caught. The modal length of the adult northern pikeminnow was about 224 mm. Since the population of adult pikeminnow was estimated to be between 62 000 and 72 000 individuals in 2004, the total catch of 43 000 since 2005 is a large proportion of the total adult population size even with annual recruitment from younger age classes. The effects of predator removal using the purse seine on the survival of juvenile sockeye can be assessed from the 2008 smolt run and in the 2009 return year. We recommend northern pikeminnow removal using seine gear be continued in 2009 to further reduce the adult population size and offset recruitment into the adult size category.

## Introduction

Cultus Lake sockeye salmon (*Oncorhynchus nerka*) were emergency listed in 2002 as endangered by the Committee on the Status of Endangered Wildlife in Canada (<http://www.cosewic.gc.ca/>). Predator control has the potential to increase freshwater survival of juvenile Cultus Lake sockeye salmon and speed the recovery of the population. The potential role of predators in affecting sockeye production was first identified by Ricker and Foerster in the 1930s (Foerster 1937; Ricker 1933; Ricker 1941) and led to an extensive removal program that lasted for over a decade. The COSEWIC status report for Cultus sockeye salmon identified predation by northern pikeminnow as a threat to recovery (COSEWIC 2003). In the National Conservation Strategy for Cultus Lake sockeye salmon, predator control is identified as an approach to improve freshwater survival and assist recovery (Cultus Sockeye Recovery Team 2005). Thus, predator control is consistent with management plans to enhance freshwater survival and aid in the recovery of this population. Furthermore, under SEF funding envelope #3, the 2007 call notes that *“The Fraser Panel believes it is prudent to begin to investigate small scale enhancement, habitat, and where applicable, predator control projects to boost spawning success and juvenile production in these (Cultus and other diminished) stocks.”*

Adult pikeminnow (those  $\geq 200$ mm) are able to consume juvenile sockeye salmon. In a mark-recapture experiment conducted in 2004 and 2005, Fisheries and Oceans Canada (DFO) estimated the adult pikeminnow population to be between 62 000 and 71 000 individuals (Bradford et al. 2007). Pikeminnow distribution has been shown to overlap during the day with that of juvenile sockeye salmon only during the winter months and pikeminnow may feed at low rates during this time (Ricker 1941). However sockeye may be vulnerable to northern pikeminnow predation at dusk and dawn during other times of the year when the juvenile sockeye are actively feeding in surface waters. Due to the large number of pikeminnow in Cultus Lake, the consumption of juvenile sockeye salmon could be appreciable even if the individual predation rate is small.

In 2005, roughly 5 000 pikeminnow were removed with a combined trapnet and angling program lasting nearly 4 months. In 2006, the commercial fishing vessel, the Rumours I, modified to operate a small-mesh purse seine was used in the lake. After an initial period

of experimentation, the vessel captured nearly 13 000 adult pikeminnow over a 5 week period, increasing the capture rate over the previous methods. After the success of the 2006 program the removal program was continued in 2007 using the same methods and removed a further 16 258 adult pikeminnow over a 7 week period (Tovey et al 2007). The objective of the 2008 program was to continue and expand the use of purse seining equipment to capture northern pikeminnow from spawning and feeding areas in Cultus Lake.

In the spring and summer the northern pikeminnow congregate near the surface of the water mainly in the near-shore waters in order to feed and to spawn (Ricker 1941). During this time the northern pikeminnow are readily available to seining. In 2007, seining operations began on May 6 and ran until June 26. Seining could not continue beyond this date safely due to the increase in the number of recreational vessels on the lake. By the time that the predator removal program began, the pikeminnow were already in their inshore distribution accessible to seining. Therefore, in 2008, seining was planned to begin a week in the season.

Continued removals at the rates seen in 2007 should significantly decrease the size of the adult pikeminnow population and lower the rate of predation on juvenile sockeye salmon. The northern pikeminnow population was again estimated by mark recapture methods in 2008. Before seining commenced in 2008 approximately 600 northern pikeminnow were tagged using trapnets and set lining. Recaptures in the purse seine operation were recorded and will be used to estimate the current adult population. Results were not available at the time of this report. The abundance of juvenile sockeye salmon is being monitored by DFO with acoustic and trawl estimates of fry abundance and counts of smolts leaving the lake in the spring. The survival of salmon broods affected by predator control will be compared to the long time series of pre-control data. As well, the effect of the predator removal program will be assessed by using the survival of fry released from the hatchery program directly into the lake as they are subject to predation during the fall and winter months in the lake.

## **Methods**

The 36' gillnetter, "Rumours I" was modified to fish as a table seiner through the addition of a boom and power block. The vessel fished a small mesh (3/8") 250 m long purse seine net. The relatively small size of the boat, compared to other purse-seiners, ensured its suitability for the lake given: the limited launching facilities, confined navigable waters, and the extensive recreational boating use of the lake. A picture of the boat and net in operation is included (Title page, Fig. 1, 2). More photos are available on the web at: [http://www-sci.pac.dfo-mpo.gc.ca/mehsd/photogallery/purse\\_seining\\_e.htm](http://www-sci.pac.dfo-mpo.gc.ca/mehsd/photogallery/purse_seining_e.htm) .

The project required a crew of four, including the captain, Regan Birch, two deckhands, Kit Taggart (vessel owner) and Rod Taylor, and an observer, Dustynn Diack. Most of the crew had experience from the pikeminnow removal program from the previous year, and the skipper had experience from a predator control program operated on Cultus Lake in 1990 and 1991. Christine Tovey and Stephanie Wall provide logistical support and advice from DFO.

In the pikeminnow removal project of 2006, it was found that the pikeminnow were most accessible to the purse seine net in the early morning and evenings. Therefore in 2007 and 2008 the crew fished both morning (roughly 06:00 to 09:00) and evening (18:00 to 21:00) sets from Sunday evening through Friday morning. During each fishing trip, the crew would drive the vessel around the margin of the lake looking for characteristic schools of pikeminnow to show on the echo sounder. When a school of pikeminnow was identified on the sounder, the net was set, the bottom rings were brought up, and the codend of the net holding the captured fish was brought to the side of the boat. A brailer was used to dip any non-target species out of the net so that they could be released alive. The pikeminnow were then brailed aboard the boat for counting, sampling and disposal.

The observer recorded the set information including the location name and coordinates (from a GPS), and time of day. He also recorded the number of non-target species caught and the number of pikeminnow in each of two size classes (adult:  $\geq 200$  mm and juvenile:  $< 200$  mm) caught in each set. He would then sample up to 200 of the adult pikeminnow for total length (to the nearest 0.5 cm) and tag presence. He would then cut them in half to obtain the sex and deflate their swim bladders and then return them to the lake. It was found that deflating the swim bladders caused the dead pikeminnow to sink

to the bottom of the lake where the carcasses could contribute to the lake ecosystem. The remainder of the pikeminnow catch was cut in half and returned to the lake without further processing.

## Results

Fishing for northern pikeminnow by the Rumours I and her crew occurred in morning and evening trips on Cultus Lake (Fig. 3) between May 1 and July 2, 2008. As in past years, during each fishing event, the crew drove the vessel around the perimeter of the lake near the inshore spawning and feeding locations of the pikeminnow.. Typical daily fishing patterns would either search the areas around the entire perimeter of the lake (e.g. May 30, 2007, Fig. 4), or would focus in an area of high abundance such as the northern portion of the lake (e.g. June 18, 2007).

Searching for pikeminnow consisted of echo sounding as the vessel traversed the lake. Once a school of pikeminnow was identified on the sounder a set was made to capture the fish. Fig. 1 and 2 are photographs of the fishing operation showing the pursing up of the net once a set is made and the hauling of the net aboard the ship using the power block. In May 1 to July 2, 2008 GPS coordinates show that sets were made throughout the lake's perimeter, with most sets on the northwest and southwest shores.

Throughout the program the crew of the Rumours I fished for 37 days and completed 20 full days of fishing (both morning and evening sets). Overall they had less success than in 2007 but still captured 8 677 adult northern pikeminnow ( $\geq 200$  mm) and 3 667 juveniles ( $< 200$ mm) (Table 1). They averaged 234 adult pikeminnow per full fishing day, and catches ranged from 0 to 3,542 on a given day (Table 1). The sex ratio of the adult catch was biased towards females, averaging 71% females (Table 2). Therefore, a large number of females were taken out of the population before they had a chance to spawn.

A total of 151 sets were made, and the average daily catch rates for adult pikeminnow ranged from 0 to 590 per set (Table 3). Over the whole fishing period the catch rate averaged 57 adult northern pikeminnow per set. The highest catch rates were found in the northwest portion of the lake between the lake outlet and the old army training site (Fig. 6). Moderate catches (101-500 pikeminnow per set) were found in the northeast

(Sunnyside campground to Entrance Bay) and southern portions of the lake. The catch rate was low early in the project possibly due to a cold, wet spring; which may have caused the pikeminnow to delay their migration to shallower water. There was a spike in the catch around the beginning of June with the arrival of warmer weather, but catch rates remained low on average through to the end of June. (Fig. 7 and 8).. Among the adult northern pikeminnow maximum fork length was 51 cm, and the median was 26.1 cm, with a modal length of 24 cm (Table 4, Fig. 9).

A total of 4 rainbow trout (*O. Mykiss*), 36 cutthroat trout (*O. Clarki*), 8 Dolly Varden char (*Salvelinus malma*), 2460 large scale suckers (*Catostomus macrocheilus*), and 184 mountain whitefish (*Prosopium williamsoni*) 107 peamouth (*Mylocheilus caurinus*), 28 kokanee, 4455 age-1 sockeye salmon and 5 residual coho salmon (*O. kisutch*), were captured and released unharmed throughout the fishing season.

## Discussion

The Cultus Lake sockeye recovery team was formed to identify recovery goals and objectives based on sound biological principles and deemed necessary to protect and recover the species. It was a multi-organizational effort involving members and specialists from Fisheries and Oceans, Canada, the Pacific Salmon Commission, SFU, UBC, the Soowahlie First Nation, Fraser Valley Salmon Society, the Canadian Fishing Company, WLAP, the Sto:Lo Nation, and the Fraser Valley Regional District. The joint efforts of the team resulted in a National Conservation strategy for Cultus Lake sockeye salmon (Cultus Sockeye Recovery Team 2005). One of the key recommendations of the strategy was the removal of northern pikeminnow.

A number of capture methods were undertaken to remove northern pikeminnow from Cultus Lake, including angling and trapnetting. These methods had some success but DFO determined that a larger proportion of the adult pikeminnow had to be removed in order to potentially of achieve a significant increase in survival of sockeye salmon. As limited seining in previous years was often



productive (Bradford et al. 2007) the SEF funded sustained efforts in 2006 and 2007 resulting in the removal of roughly 29 000 adult northern pikeminnow, tripling the annual catch of previous methods. In 2008, the catch of 8 677 was somewhat reduced but still double that of previous methods. The reduced catch in spite of similar effort may have resulted from a late spring, reducing the availability of northern pikeminnow to the fishing gear or it may be due to a reduced population of adult northern pikeminnow. Purse seining in future years and the results of the 2008 mark recapture effort will assist in distinguishing between these two hypothesis and will provide one measure of the success of the program.

The effects of the pikeminnow removal using purse seine on the survival of juvenile sockeye salmon in Cultus Lake is being assessed by DFO. Initial results of the 2008 brood year are uncertain as there is considerable doubt about the amount of prespawn mortality that occurred in Cultus Lake sockeye in the fall of 2007. Surplus fry released from the hatchery broodstock conservation program did have the highest survivals recorded to date but further analysis of all data is needed before conclusions can be reached. The first adult returns affected by predator removal by purse seine will not be until 2009 and due to the highly variable nature of freshwater and marine survival, a number more years of northern pikeminnow removal will be needed to fully evaluate the effectiveness of the removal program.

## **Conclusions and Recommendations**

Purse seining has proven to be an efficient method of removing adult northern pikeminnow from Cultus Lake, as they were able to catch two to three times the number that earlier efforts were able to catch. Since recruitment of juvenile pikeminnow into the adult size class capable of consuming juvenile sockeye continues, we recommend the continuation of predator removal using purse seine in 2008.

## References

- Bradford, M.J., Amos, J. Tovey, C.P., Hume, J.M.B, Grant, S. and Mossop, B. 2007. Abundance and migratory behaviour of northern pikeminnow (*Ptychocheilus oregonensis*) in Cultus Lake, British Columbia and implications for predator control. Can. Tech. Rep. Fish. Aquat. Sci. 2723: vii + 47 p.
- Cultus Sockeye Recovery Team. 2005. National conservation strategy for sockeye salmon (*Oncorhynchus nerka*), Cultus Lake population, in British Columbia. Recovery of Nationally Endangered Wildlife (RENEW). Ottawa, Ontario, 49 pp.
- COSEWIC. 2003. COSEWIC assessment and status report on the sockeye salmon *Oncorhynchus nerka* (Cultus population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. lx + 57 pp.
- Foerster, R.E. 1937. Increasing the survival rate of young sockeye salmon by removing predatory fishes. Pacific Biological Station Progress Report. No 32.
- Ricker, W.E. 1933. Destruction of sockeye salmon by predatory fishes. Pacific Biological Station Report.
- Ricker, W.E. 1941. The consumption of young sockeye salmon by predaceous fish. J. Fish. Res. Bd. Can. 5 (3).

Table 1. The daily catch of northern pikeminnow by size class in the purse seine in 2008

Date	Pikeminnow =20cm	Pikeminnow <20cm	Total Pikeminnow
1-May-08	0	0	0
7-May-08	0	0	0
8-May-08	3	0	3
15-May-08	135	0	135
16-May-08	5	0	5
20-May-08	170	0	170
21-May-08	5	0	5
22-May-08	22	0	22
23-May-08	2	0	2
26-May-08	306	65	371
27-May-08	59	0	59
28-May-08	237	2	239
29-May-08	118	0	118
30-May-08	84	1048	1132
02-Jun-08	339	36	375
03-Jun-08	550	0	550
04-Jun-08	127	39	166
05-Jun-08	3542	79	3621
06-Jun-08	0	0	0
09-Jun-08	4	0	4
10-Jun-08	6	0	6
11-Jun-08	1845	10	1855
12-Jun-08	0	0	0
13-Jun-08	27	1	28
16-Jun-08	168	139	307
17-Jun-08	3	0	3
18-Jun-08	0	0	0
19-Jun-08	51	3	54
20-Jun-08	50	0	50
23-Jun-08	8	0	8
24-Jun-08	4	546	550
25-Jun-08	170	116	286
26-Jun-08	2	0	2
27-Jun-08	0	0	0
30-Jun-08	97	214	311
01-Jul-08	401	1057	1458
02-Jul-08	137	312	449
<b>Total</b>	<b>8677</b>	<b>3667</b>	<b>12344</b>

Table 2. The daily catch of northern pikeminnow females (F), males (M), and unknown sex (UK) of all sizes and ages, captured by the purse seine in 2008.

Date	Total Caught	F	M	UK	% Female
1-May-08	0				
7-May-08	0				
8-May-08	3	3	0	0	100%
15-May-08	135	104	29	2	78%
16-May-08	5	5	0	0	100%
20-May-08	170	86	80	4	52%
21-May-08	5	4	1	0	80%
22-May-08	22	20	1	1	95%
23-May-08	2	2	0	0	100%
26-May-08	371	199	96	18	67%
27-May-08	59	35	18	6	66%
28-May-08	239	128	98	13	57%
29-May-08	118	77	37	4	68%
30-May-08	1132	29	50	1053	37%
02-Jun-08	375	109	77	189	59%
03-Jun-08	550	137	70	343	66%
04-Jun-08	166	97	29	40	77%
05-Jun-08	3621	93	126	3402	42%
06-Jun-08	0	0	0	0	
09-Jun-08	4	4	0	0	100%
10-Jun-08	6	5	1	0	83%
11-Jun-08	1855	144	57	1654	72%
12-Jun-08	0	0	0	0	
13-Jun-08	28	18	7	3	72%
16-Jun-08	307	116	37	154	76%
17-Jun-08	3	3	0	0	100%
18-Jun-08	0	0	0	0	
19-Jun-08	54	31	16	7	66%
20-Jun-08	50	30	1	19	97%
23-Jun-08	8	2	6	0	25%
24-Jun-08	550	3	1	546	75%
25-Jun-08	286	89	77	120	54%
26-Jun-08	2	2	0	0	100%
27-Jun-08	0	0	0	0	
30-Jun-08	311	50	36	225	58%
01-Jul-08	1458	100	99	1259	50%
02-Jul-08	449	42	94	313	31%
Total	12344	1767	1144	9375	71%

Table 3. The daily number of purse seine sets made (effort) and the average catch per set (CPUE) of adult northern pikeminnow ( $\geq 20$  cm) in 2008.

Date	#of Sets	Adult Pikeminnow Catch	Pikeminnow CPUE
1-May-08	2	0	0.0
7-May-08	2	0	0.0
8-May-08	4	3	0.8
15-May-08	5	135	27.0
16-May-08	3	5	1.7
20-May-08	3	170	56.7
21-May-08	6	5	0.8
22-May-08	4	22	5.5
23-May-08	1	2	2.0
26-May-08	9	306	34.0
27-May-08	5	59	11.8
28-May-08	6	237	39.5
29-May-08	6	118	19.7
30-May-08	3	84	28.0
02-Jun-08	7	339	48.4
03-Jun-08	3	550	183.3
04-Jun-08	7	127	18.1
05-Jun-08	6	3542	590.3
06-Jun-08	1	0	0.0
09-Jun-08	1	4	4.0
10-Jun-08	4	6	1.5
11-Jun-08	6	1845	307.5
12-Jun-08	4	0	0.0
13-Jun-08	3	27	9.0
16-Jun-08	7	168	24.0
17-Jun-08	4	3	0.8
18-Jun-08	2	0	0.0
19-Jun-08	2	51	25.5
20-Jun-08	6	50	8.3
23-Jun-08	5	8	1.6
24-Jun-08	2	4	2.0
25-Jun-08	4	170	42.5
26-Jun-08	4	2	0.5
27-Jun-08	1	0	0.0
30-Jun-08	4	97	24.3
01-Jul-08	5	401	80.2
02-Jul-08	4	137	34.3
<b>Total</b>	<b>151</b>	<b>8677</b>	<b>57.5</b>

Table 4. Length frequency for pikeminnow that were sampled. A maximum of 200 adult pikeminnow ( $\geq 20$  cm) were sampled from each set (lengths  $< 20$  cm are not randomly sampled and are not included in the proportion).

Length range (cm)	Frequency	Proportion
6 - 8	0	
8 - 10	0	
10 - 12	0	
12 - 14	0	
14 - 16	0	
16 - 18	0	
18 - 20	23	
20 - 22	494	0.16
22 - 24	552	0.18
24 - 26	439	0.14
26 - 28	433	0.14
28 - 30	491	0.16
30 - 32	396	0.13
32 - 34	170	0.06
34 - 36	41	0.01
36 - 38	17	0.01
38 - 40	6	0.00
40 - 42	4	0.00
42 - 44	5	0.00
44 - 46	2	0.00
46 - 48	1	0.00
48 - 50	1	0.00
50 - 52	1	0.00
52 - 54	0	0.00
54 - 56	0	0.00
Total	3076	



Fig.1. The fishing vessel, Rumours I, in operation on Cultus Lake.



Fig. 2. The crew of the fishing vessel, Rumours I, pulling in the purse seine net.

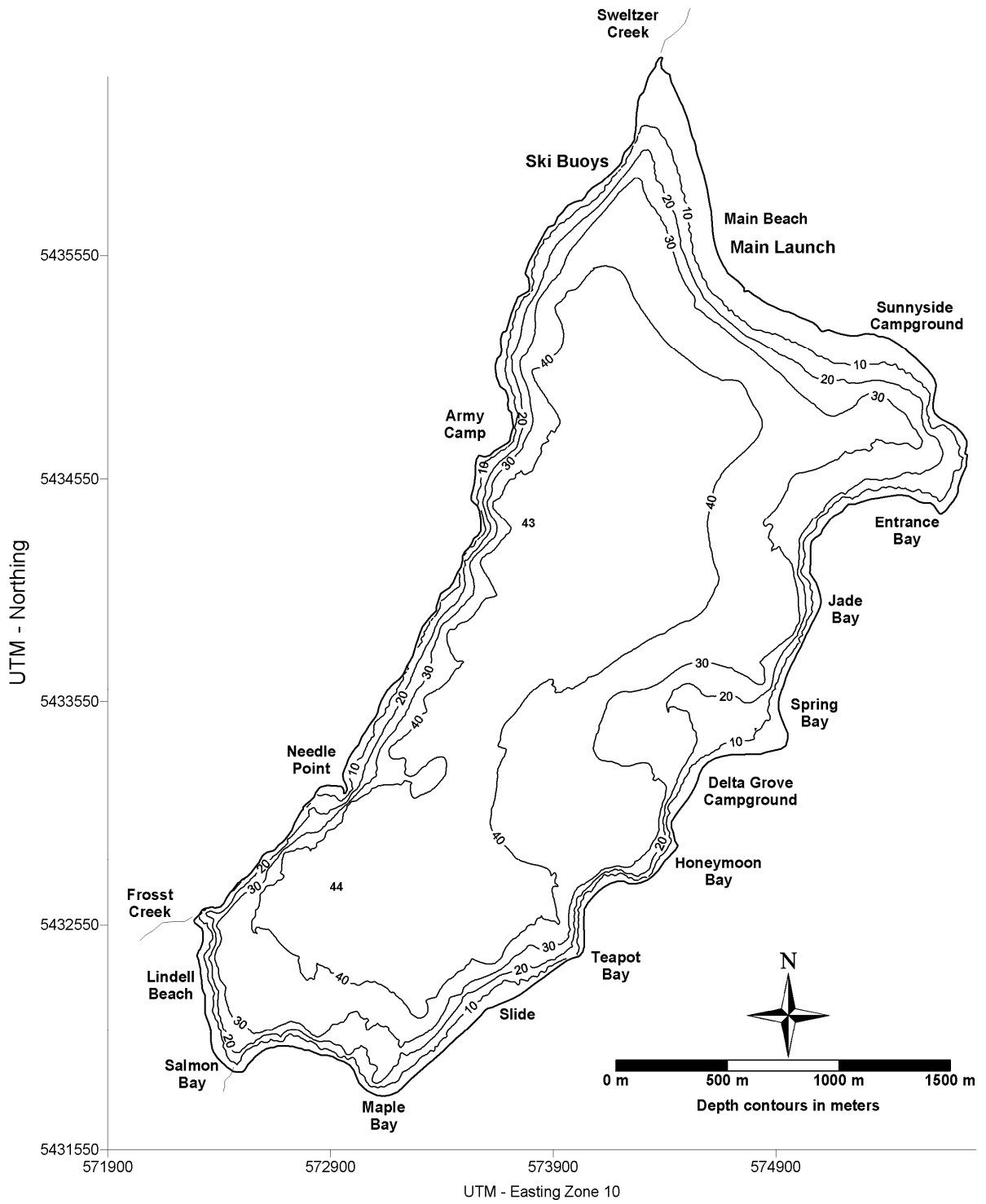


Fig. 3. Map of Cultus Lake showing the main features.



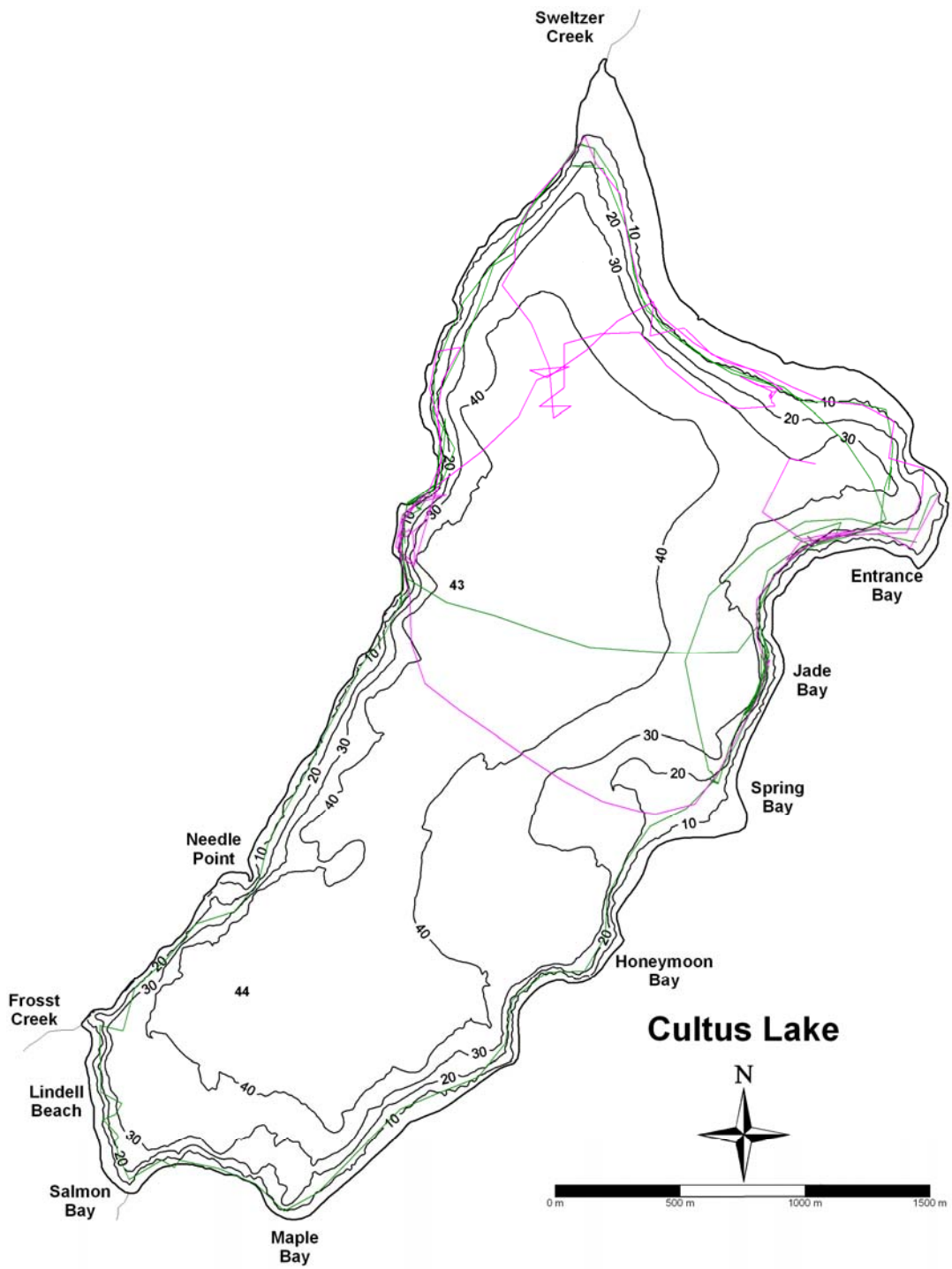


Fig. 4. Representative tracks (May 30 (green) and June 18 (purple) track of Rumours I while seining for northern pikeminnow on Cultus Lake in 2007.

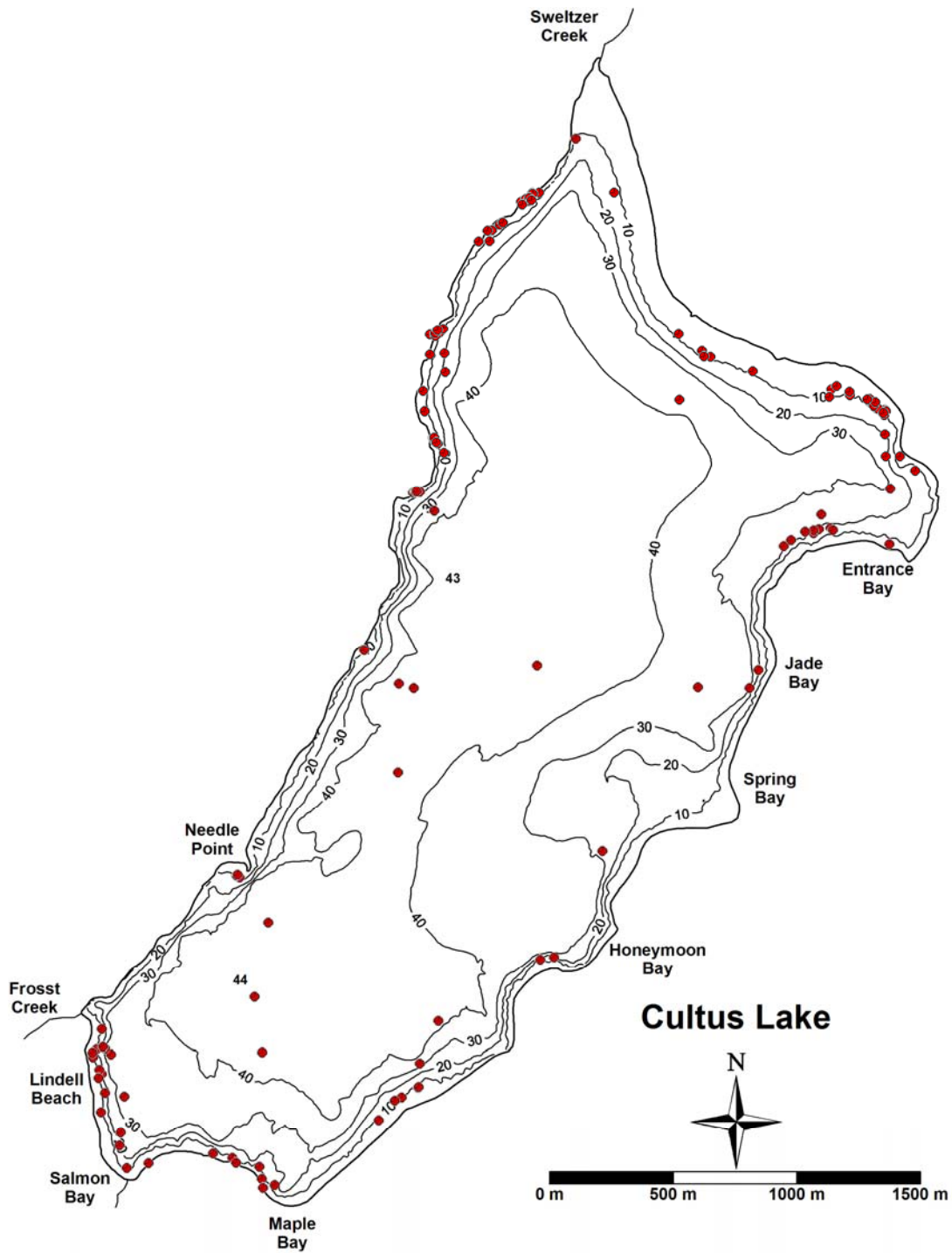


Fig. 5. Location of all purse seine sets with GPS coordinates in spring of 2008. Not all sets are visible because of overlap.

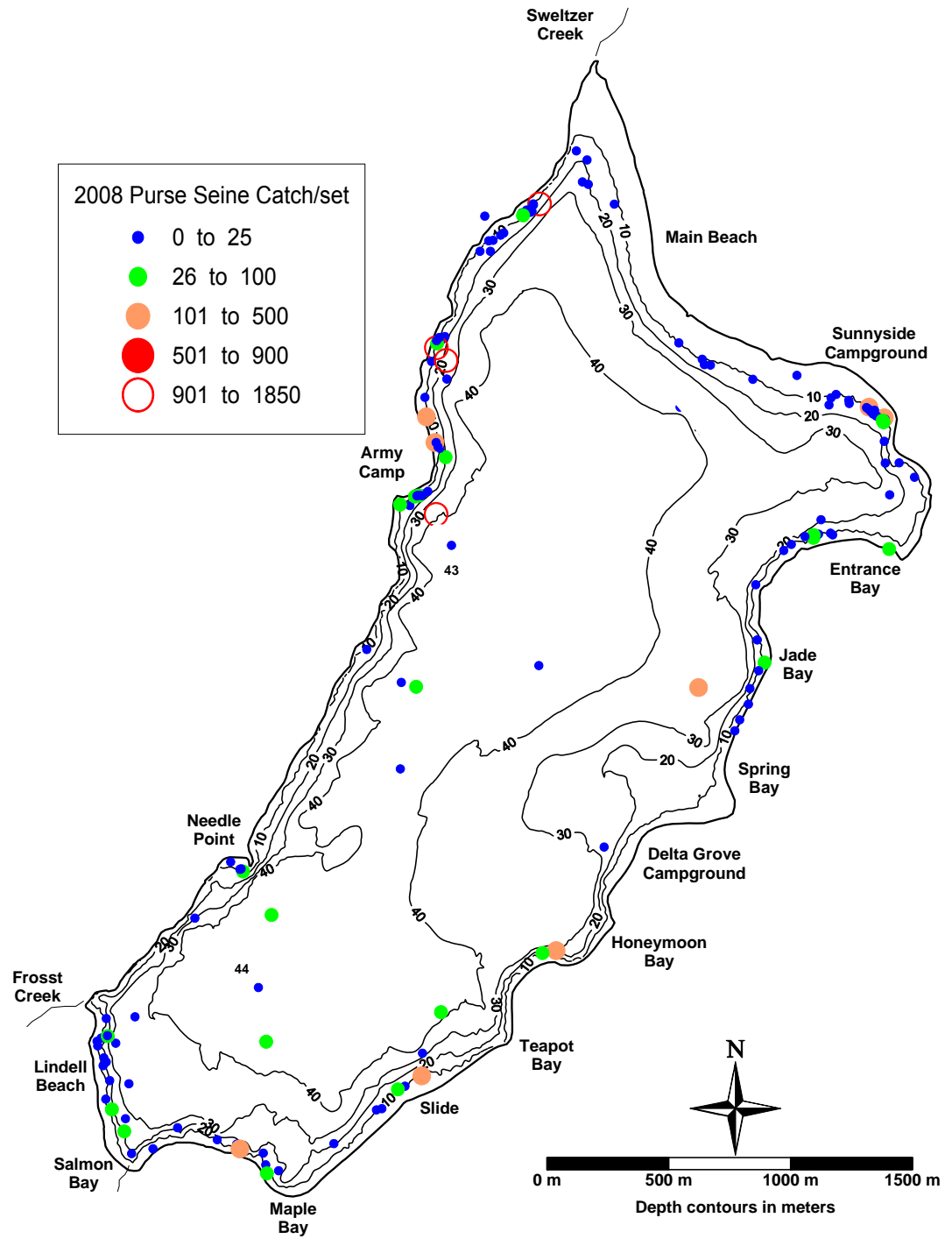


Fig. 6. 2008 purse seine catch per set of northern pikeminnow in Cultus Lake.

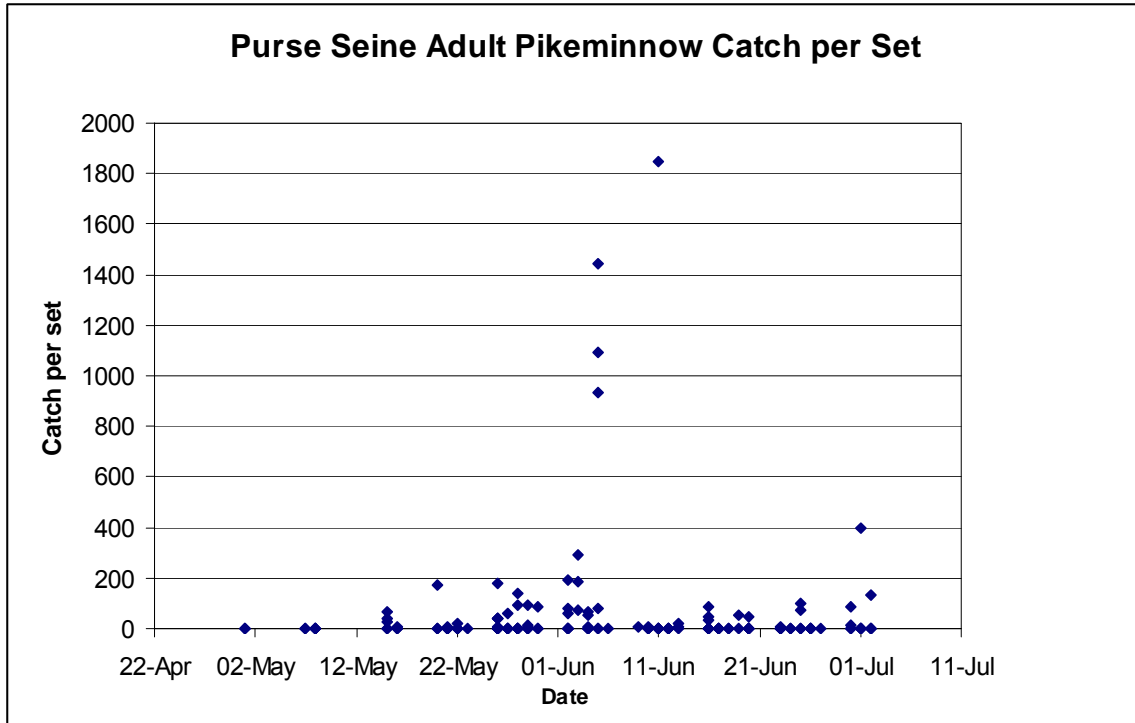


Fig. 7. Purse seine catch per set of northern pikeminnow in Cultus Lake from May 1 to July 2, 2008.

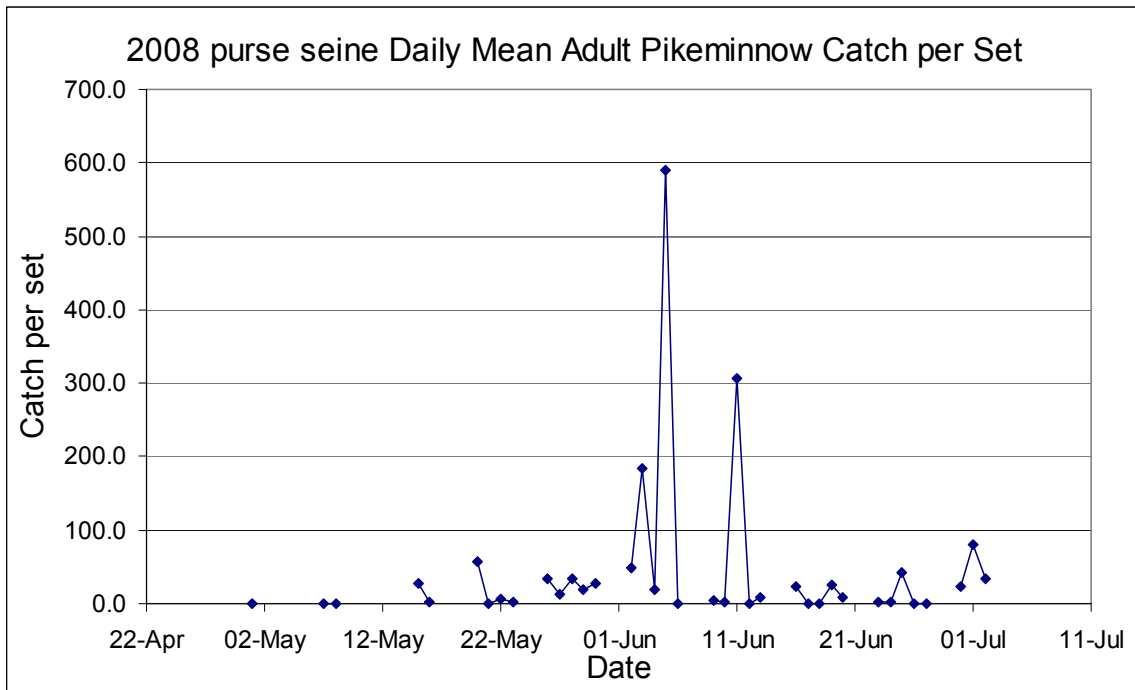


Fig. 8. Mean daily purse seine catch per set of northern pikeminnow in Cultus Lake from May 1 to July 2, 2008.

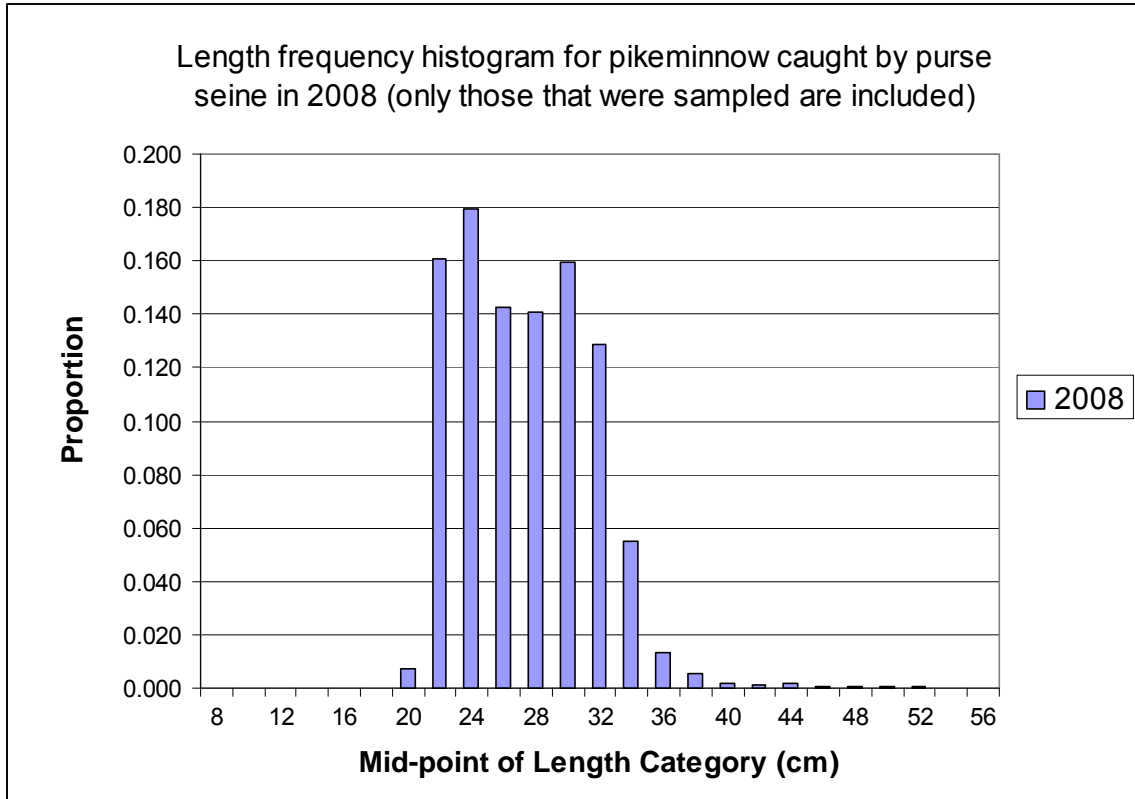


Fig 9. The length frequency histogram for pikeminnow caught by purse seine in 2008. A maximum of 200 pikeminnow were sampled on a given day – the majority of which were in the adult size class ( $\geq 200$  mm).

## **Appendix A: Financial Statement of Project Expenditures**

**Project Budget Form**

SF-2008-E-7. Connolly

Page 1 of 2

Name of Project: Cultus Lake Sockeye - Improved Freshwater Survival

	<b>BUDGET</b>	<b>CONTRIBUTION</b>	<b>ACTUAL EXPENDITURE</b>	<b>VARIANCE</b>	<b>% VAR</b>
<b>ELIGIBLE COSTS</b>		<b>OTHER FUNDING</b>	<b>FUNDING</b>		

**Labour - Wages and Salaries**  
Wages & Salaries

Position	# of crew	# of work days	hrs per day	rate per hour	Total (PSC + in-kind + cash)	In-Kind & Cash	PSC Amount			
Coordinator	2	10	8	\$30/\$20	\$ 4,000.00		\$4,000.00	\$3,520.00	(\$480.00)	-12.0%
Observer	1	37	8	22	\$ 6,500.00		\$6,500.00	\$6,688.00	\$188.00	2.9%
Employer Contribution EI CPP					\$ 1,200.00		\$1,200.00	\$737.20	(\$462.80)	-38.6%
Person days		57			subtotal	\$ 11,700.00	\$11,700.00	\$10,945.20	(\$754.80)	-6.5%

**Labour - Employer Costs (percent of wages subtotal amount)**

Observer WCB(employer contribution)	2.39%	subtotal								
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Subcontractors & owner/operator	# of crew	# work days	hrs per day	rate per day						
Seine boat and owner/operator		37		600	\$ 22,200.00		\$22,200.00	\$22,800.00	\$600.00	2.7%
Fishing crew		37		700	\$ 25,900.00		\$25,900.00	\$26,600.00	\$700.00	2.7%
Insurance, EI, and V	rate				subtotal	\$ 48,100.00	\$48,100.00	\$49,400.00	\$1,300.00	2.7%

**Volunteer Labour**

Skilled										
Un-skilled										
Insurance if applicable	rate				subtotal					
<b>Total Labour Costs</b>					\$ 59,800.00		\$59,800.00	\$60,345.20	\$545.20	0.9%

**Site/Project costs**

	Detail									
Travel	Coordinator									
Small Tools and equipment	Miscellaneous materials			\$ 2,000.00		\$2,000.00	\$110.11	(\$1,889.89)		-94.5%
Site Supplies & Equipment	Fuel and Moorage			\$ 3,500.00		\$3,500.00	\$2,900.79	(\$599.21)		-17.1%
Equipment rental										
Work and Safety gear										
Repairs & Maintenance	re and re seine net			\$ 5,000.00		\$5,000.00	\$2,844.00	(\$2,156.00)		-43.1%
Other site costs	Accommodation			\$ 1,750.00		\$1,750.00	\$1,815.00	\$65.00		3.7%
	Groceries			\$ 1,750.00		\$1,750.00	\$1,394.28	(\$355.72)		-20.3%
Insurance for vessel				\$ 1,000.00		\$1,000.00	\$1,000.00	\$0.00		0.0%
Boat transporter				\$ 1,700.00		\$1,700.00	\$2,100.00	\$400.00		23.5%
<b>Total Site/Project Costs</b>					\$ 16,700.00		\$16,700.00	\$12,164.18	(\$4,535.82)	-27.2%

<b>Training</b>					Total (PSC + in-kind + cash)	In-Kind & Cash	PSC Amount			
Name of course	# of crew	# of days								
<b>Total Training Costs</b>										

**Overhead/ Indirect costs(not to exceed 20% of PSC Amount)**

Report preparation										
<b>Total Overhead Costs</b>										

**Capital Costs/ Assets**

\* Assets are things of value that have an initial cost of \$250 CAN or more and which can be readily misappropriated for personal use or gain for which are not, or will not, be fully consumed during the term of the project.

Total Capital Costs										
Project Total Costs				\$ 76,500.00		\$76,500.00	\$72,509.38	\$3,990.62		-5.2%

**Budget Summary (PSC + in-kind + cash)**

Total Labour Costs		\$60,345.20	Total Grant	\$76,500.00
Total Site/Project Costs		\$12,164.18	1st advance	\$38,250.00
Total Training Costs			2nd advance	\$30,600.00
Total Overhead Costs			3rd advance	\$3,659.38
Total Capital Costs			Total advances	\$72,509.38
Project total		\$ 72,509.38		