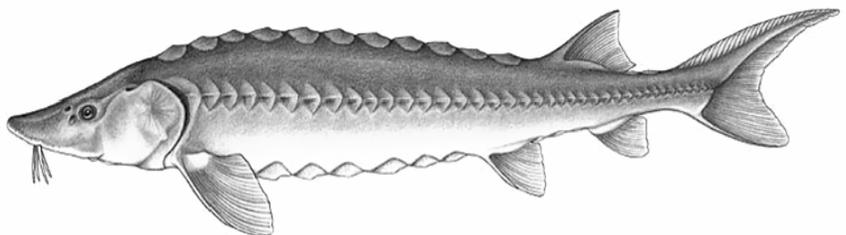


Movement and Seasonal Distribution of Lake Sturgeon in the Namakan River, Ontario

Progress Report (Update)
2009



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**PROGRESS REPORT (UPDATE)
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ABSTRACT

Acoustic telemetry was used to assess movement and seasonal distribution of adult lake sturgeon in the Namakan River between Namakan Lake and Lac La Croix, Ontario from May 2007 to October 2009. Three hydroelectric generating facilities are proposed for development at Hay Rapids, High Falls, and Myrtle Falls by Ojibway Power and Energy Group (OPEG). Thirty-four sturgeon were sampled, surgically implanted with coded transmitters, and released. An array of 15 submersible, hydrophone receivers were deployed at points of rapid elevation change (falls and rapids) along the river extending from below Lady Rapids to above Snake Falls. Preliminary findings confirmed both upstream and downstream migration of sturgeon at most locations including Lady Rapids, Hay Rapids, Back Channel around Eva Island, Quetico Rapids, Twisted Rapids and Myrtle/Ivy Falls. Only downstream migration over High Falls was confirmed, along with movement into Quetico Provincial Park at two locations, including Quetico River and Bearpelt Creek below Wolseley Rapids. A total of 397 sturgeon (605 to 1,746 mm in length) were also tagged with 18 reported recaptures. Both tagged ($n = 4$) and telemetered ($n = 22$) lake sturgeon moved to and from the Namakan Reservoir (a shared international water with Minnesota). Additional telemetered fish ($n = 15$) from the Reservoir also moved into the Namakan River above Lady Rapids during the study period. Potential spawning habitats exist at most natural rapids based on the presence or staging of fish during critical periods. Selection of preferred habitats was confirmed in the three lake environments and below major rapids or falls. Sturgeon avoided shallow rapids in winter with no detected movement after freeze-up, and over-winter habitats selected by individual fish were also documented. Mean speed of travel for movements exceeding 10 km was 3.4 km/day. Fish moved through shallow rapids and falls at water flows ranging from 33 to 464 m³/sec and temperatures ranging from 6.8 to 24.9°C. Movements of lake sturgeon were evaluated in relation to season, water flow and temperature, for consideration in environmental assessments and water management planning. Preliminary results of this study provide insight into the importance of the entire river system to the continued sustainability of the population.

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The following text, tables, figures and appendices represent an update to the preliminary technical report (McLeod and Debruyne, 2009) with data analysis completed to October 23, 2009. Several sections have not been revised to include 2009 (Year 3) information including: seasonal distribution; monthly movements; diel movements; duration, distance and speed of travel.

INTRODUCTION

During this study, the provincial designation of lake sturgeon (NW Ontario populations) changed from “Special Concern” to “Threatened” under the Endangered Species Act (S.O. 2007). The recommendation for status change was made by the Committee on the Status of Species at Risk in Ontario (COSSARO) and came into effect on September 11, 2009. As a result, the species is now protected from being harmed or harassed which includes prohibition on sale or trade, as well as habitat protection. In addition, there is a legal requirement to develop a recovery strategy within 2 years and to have a specific habitat regulation in place within 3 years. Concurrent with these requirements, the angling season for lake sturgeon was closed all year effective October 13, 2009.

METHODS

Two additional receivers were deployed above Ivy Falls and below Myrtle Falls on May 14 and May 20, 2009 respectively, in order to investigate the movement of lake sturgeon through Myrtle and Ivy Falls, and the associated side channels. A replacement receiver was also deployed below Lady Rapids (mouth of Namakan River) on May 28, 2009 as the original receiver had disappeared due to theft or human disturbance. No data was available from this receiver for the period of September 6, 2008 to May 27, 2009. The receiver located above Hay Rapids (Little

Eva Lake) was also inoperable due to a battery malfunction for the period March 1 to May 28, 2009 and again from June 17 to July 21, 2009.

RESULTS AND DISCUSSION

Table 4 provides a revised summary of the serial number, description and location of all 15 receivers deployed in the study since May, 2007. A total of 2,448,176 detections were recorded throughout the Namakan River over the 2007-2009 sampling period (Table 5). Detections for a single receiver ranged from 0 (above Snake Falls) to 1,136,160 (Little Eva Lake above Hay Rapids). Each receiver detected a mean of 20.0 fish with a range of 0-39 (Table 5).

Daily movement patterns between all 15 receiver locations were analyzed for each individual lake sturgeon implanted with a transmitter in 2007 and 2008 (Appendix I and II respectively). All 34 implanted sturgeon, along with an additional 18 individuals from the collaborative Namakan Reservoir study, were detected at a minimum of one receiver location in the Namakan River (Table 6). The maximum number of detections from a single fish was 445,361 (ID 8494), however this fish was only detected at a single receiver since it was released below Snake Falls on May 2, 2008. Excluding this fish, the next highest number of detections was 275,781 (ID 4753), while the minimum was 3 (ID 49650). One individual (ID 4589) was detected at 13 of the 15 stations, over a distance of 28.8 km. Six individuals were detected at one station only, and the mean number of receivers at which an individual fish was detected at was 5.8. Eighteen of the 26 fish released in the Namakan Reservoir were detected in the Namakan River study area, with 15 of these fish located upstream of Lady Rapids.

Movements of individual fish through shallow rapids and falls along the river were also evaluated based on detections from both upstream and downstream receivers (Table 8).

Movements through the proposed hydro development sites at Hay Rapids, High Falls, Back

Channel, and Ivy/Myrtle Falls were documented (Appendix III), as well as all other undeveloped sites along the Namakan River and Quetico River (Appendix IV). The only exceptions were that no movements were recorded through Snake Falls or upstream at High Falls. The maximum number of movements ($n = 94$) was observed at Lady Rapids in the lowest reach of the Namakan River. This was followed closely by Twisted Rapids ($n=90$) at the outlet of Three Mile Lake, with direction of movement equally distributed between upstream and downstream over the sampling period. The most significant observations were 20 downstream movements of 15 individual fish over High Falls, an elevation drop of 6.8 m. Thirteen of these movements occurred in 2009, in the third year of study. In addition, both upstream and downstream movements of sturgeon through the Back Channel were documented since October, 2007. Of the 28 recorded fish movements, the majority (82%) were moving upstream from Little Eva Lake to Bill Lake.

Another significant observation was the upstream and downstream movement of 7 additional fish in the Quetico River in late May, 2009. These documented movements suggest that potential spawning habitats may exist above the first rapids in Quetico River within Quetico Provincial Park. Similarly, the aggregation of 10 fish below High Falls over the period of May 12 to 29, 2009 with suitable water temperatures would also support the potential spawning or feeding habitat.

The addition of two receivers adjacent Ivy and Myrtle Falls have helped identify fish movements through these areas and the associated side channels. Initial findings suggest that downstream movements occur through both Ivy and Myrtle Falls ($n = 10$), however upstream migration ($n = 7$) of telemetered fish occurs most often on the side channel(s) where elevation and flow/velocities are lower.

The over-winter locations of telemetered sturgeon were also evaluated after three years of study. Based on data from 34 fish originally released in Namakan River, the most important winter habitat appeared to be located in the Namakan Reservoir, where the majority of fish were detected over two winters (n=32). An additional 12 fish selected over-winter habitats in Three Mile Lake and 8 fish selected Little Eva Lake. The remaining over-winter locations within Namakan River included Bill Lake (n=4), below Snake Falls (n=3) and below Hay Rapids (n=3). During the winter of 2008/09, an additional 11 fish from the Namakan Reservoir study were located in Little Eva Lake (n=8) and Three Mile Lake (n=3) suggesting high fidelity for the river system.

Mean daily water temperatures from a HOBO temperature logger were also obtained for Lady Rapids from May 10, 2007 to October 19, 2009 (Appendix V). Movements through the rapids/falls occurred between temperatures of 6.8-23.5°C downstream and 6.8-24.9°C upstream (Figure 5). In general, no movement of fish through shallow rapids/falls were recorded when temperatures were lower than 6.8°C. For comparison purposes, a temperature logger was also deployed in the lowest reach of the Back Channel from May 30 to October 23, 2009. Although the Back Channel appeared to cool and warm earlier than the main river at Lady Rapids, regression analysis indicated that mean daily temperatures were highly correlated in 2009 ($r^2 = 0.98$). Details of downstream and upstream fish movements in relation to temperature through each undeveloped rapids/falls are provided in Appendix VI.

Estimated daily outflows from Lac La Croix for 2007-2009 were provided by the Lake of the Woods Control Board (LWCB, 2009), and were used to represent the flow conditions in the Namakan River (Appendix VII). Downstream or upstream movements of lake sturgeon were

related to daily mean water flows at each of the undeveloped rapids/falls along the river (Table 10). There were no documented movements of fish at Snake Falls, and water flow information was not available for Quetico River and Bearpelt Creek within QPP. Water flows from the river could not be used for the Back Channel where only a portion of the natural flow occurs around Eva Island and High Falls. Simulated Back Channel flows for the study period were provided by OPEG (February 4, 2009) based on the flow distribution provided in Technical Note #2, Revision 3.0 (Genivar, 2009).

Ivy/Myrtle Falls had the highest mean flow for both downstream and upstream movements at 300 m³/sec and 396 m³/sec respectively. Other than the Back Channel, Lady Rapids had the lowest mean flow for downstream movements at 201 m³/sec, while Twisted Rapids had the lowest mean flow for upstream movements at 205 m³/sec. The minimum flow used by sturgeon at any of the shallow rapid/falls was 33 m³/sec at Quetico Rapids. Field observations suggest that this location had the lowest elevation change. Lake sturgeon were also able to move upstream at river flows as high as 464 m³/sec at both Quetico Rapids and Ivy/Myrtle Falls. Movement of telemetered fish (n = 28) also occurred in the Back Channel in late fall 2007 and in spring/summer of 2008 and 2009 with flows ranging from 9 to 31 m³/sec. Mean flows during upstream and downstream movements were estimated at 23 and 22 m³/sec respectively.

Movements through undeveloped rapids/falls also occurred during periods of increasing and decreasing outflow from May through November (Figure 6). The majority of fish movements in 2008 and 2009 occurred in both directions during a lengthy period of decreasing outflow from June 1 to September 30. In contrast, no movement was documented during the period of increasing flows in spring 2008, and little movement in 2009. Details of downstream and

upstream movements through each undeveloped rapids/falls in relation to outflow are provided in Appendix VIII.

ADDITIONAL REFERENCES

Genivar, 2009. High Falls and Hay Rapids: Water levels and flow measurements. Technical Note

#2, Revision 3.0. December 17, 2009. 5 p.

McLeod, D. and C. Debruyne. 2009. Movement and seasonal distribution of lake sturgeon in the

Namakan River, Ontario. Preliminary Report 2007-08. Ontario Ministry of

Natural Resources. Fort Frances District Report Series No. 82. 89 p.

Table 4: Serial number, description and location of VR2W submersible acoustic receivers in the Namakan River, Ontario from 2007 to 2009.

Receiver Serial No.	UTM Location	Date of Deployment	Time of Deployment	Location Description
100847	547347 5365369	15-May-07	17:57	Namakan River - below Hay Rapids
100846	548468 5366363	17-May-07	17:50	Little Eva Lake – above Hay Rapids
100855	549195 5365895	17-May-07	11:22	Namakan River – back channel above first rapids
100853	550641 5366874	18-May-07	13:50	Little Eva Lake – below High Falls
100849	555250 5369250	22-May-07	16:00	Quetico River – above first rapids (QPP)
100848	553224 5367427	22-May-07	16:25	Namakan River – above Quetico (Bill) Rapids
100851	544310 5366389	22-May-07	18:40	Namakan River – below Lady Rapids (VNP)
100852	550984 5365634	23-May-07	17:25	Bill Lake – above back channel
100850	560161 5363439	24-May-07	16:45	Three Mile Lake – below Ivy and Myrtle Falls channel
100689	558319 5367294	24-May-07	19:07	Three Mile Lake – above Twisted Rapids
100854	560235 5364154	25-May-07	10:18	Three mile Lake – mouth of Bearpelt Creek (QPP)
100851 ¹	540596 5366483	28-May-07	15:00	Namakan River – mouth of Namakan Lake
100849 ²	555305 5369225	18-Sept-07	11:40	Quetico River – below second rapids
100854 ³	562169 5364364	12-Oct-07	10:48	Bearpelt Creek - below Wolseley Lake (QPP)
101942	561210 5360316	30-April-08	11:20	Namakan River – below Snake Falls
103459	561160 5358657	22-May-08	15:15	Namakan River – above Snake Falls (OPEG)
100689 ⁴	558003 5367479	18-Sept-07	14:09	Namakan River - below Twisted Rapids
104898	562350 5361290	14-May-09	13:14	Namakan River- Above Ivy Falls
104900 ⁵	544310 5366389	28-May-09	14:40	Namakan River – below Lady Rapids
104901	559827 5362906	20-May-09	10:12	Namakan River- below Myrtle Falls

¹ moved due to disturbance by anglers, and more suitable, long-term location.

² moved further upstream to deeper water below second rapids to avoid potential freeze-in during winter months.

³ moved to planned location within QPP. Low water prevented boat access to Bearpelt Creek prior to Oct/07.

⁴ moved to below Twisted Rapids to better evaluate habitat use below the rapids, while still documenting fish passage

⁵ replaced 100851 at the mouth of Namakan Lake due to theft or human disturbance.

Table 5: Lake sturgeon detections by receiver location in the Namakan River, Ontario from May, 2007 to October, 2009.

Location No.	Location Description	Distance Upstream (km)	Receiver Serial No.	No. Detections	No. Transmitters Detected
1	Below Lady Rapids	0	100851/104900	200,916	39
2	Below Hay Rapids	7.4	100847	101,500	38
3	Little Eva Lake	9.1	100846	1,136,160	37
4	Below High Falls	11.7	100853	60,808	31
5	Lower Back Channel	10.2	100855	3200	19
6	Bill Lake	12.6	100852	222,483	22
7	Above Quetico Rapids	14.7	100848	6,776	21
8	Quetico River	17.5	100849	2332	5
9	Below Twisted Rapids	20.0	100689	45,810	22
10	Bearpelt Creek ¹	27.4	100854	6,400	9
11	Three Mile Lake	24.7	100850	86,991	25
12	Below Myrtle Falls	25.5	104901	13,822	15
13	Above Ivy Falls	27.3	104898	11,402	6
14	Below Snake Falls	28.8	101942	549,576	11
15	Above Snake Falls	30.5	103459	0	0
Total	-	-	-	2,448,176	-
Mean	-	-	-	163,211.73	20

¹ only 2 fish detected at revised location after October 12, 2007

Table 6: Individual lake sturgeon detections and last known date/location by transmitter code in the Namakan River, Ontario from May, 2007 to October, 2009. Shaded rows represent transmitters detected from the Namakan Reservoir study.

Transmitter ID Code	Release Date	Release Location	Last Detection Date	Last Known Location	No. Detections	No. Receivers
4739	15-May-07	Below Hay Rapids	21-Oct-09	Little Eva Lake	52,208	4
4740	15-May-07	Below Hay Rapids	19-Jun-09	Namakan Lake	50,411	12
4741	15-May-07	Below Hay Rapids	19-Oct-09	Little Eva Lake	117,541	10
4742	15-May-07	Below Hay Rapids	27-Sep-09	Namakan Lake	61,082	4
4743	15-May-07	Below Hay Rapids	11-Oct-09	Namakan Lake	5,781	2
4744	16-May-07	Below Hay Rapids	21-Oct-09	Little Eva Lake	71,256	4
4745	16-May-07	Below Hay Rapids	21-Oct-09	Little Eva Lake	19,399	4
4746	16-May-07	Below Hay Rapids	21-Oct-09	Little Eva Lake	87,972	2
4747	16-May-07	Below Hay Rapids	18-May-07	Below Hay Rapids	453	1
4748	16-May-07	Below Hay Rapids	10-Aug-09	Namakan Lake	56,772	2
4749	17-May-07	Little Eva Lake	28-May-08	Namakan Lake	2,889	4
4750	17-May-07	Little Eva Lake	06-Jun-09	Namakan Lake	11,985	4
4751	17-May-07	Little Eva Lake	03-Oct-07	Namakan Lake	51,733	3
4752	17-May-07	Little Eva Lake	21-Oct-09	Little Eva Lake	60,243	4
4753	17-May-07	Little Eva Lake	21-Oct-09	Little Eva Lake	275,781	2
4588	18-May-07	Little Eva Lake	07-Jun-09	Namakan Lake	59,245	4
4589	18-May-07	Little Eva Lake	06-Jul-09	Namakan Lake	5,530	13
4590	18-May-07	Little Eva Lake	20-Oct-09	Namakan Lake	5,908	4
4591	18-May-07	Little Eva Lake	23-Jul-09	Namakan Lake	58,435	4
4592	18-May-07	Little Eva Lake	21-Oct-09	Little Eva Lake	178,160	12
4593	23-May-07	Bill Lake	12-Jul-09	Bill Lake	10,717	9
4594	23-May-07	Bill Lake	04-Oct-09	Three Mile Lake	30,036	11
4595	23-May-07	Bill Lake	31-May-09	Namakan Lake	12,445	10
4596	23-May-07	Bill Lake	21-Oct-09	Bill Lake	140,543	1
4597	23-May-07	Bill Lake	03-Aug-09	Bill Lake	3,311	4
4598	24-May-07	Three Mile Lake	16-Oct-09	Three Mile Lake	37,995	4
4599	24-May-07	Three Mile Lake	20-Jun-09	Above Ivy Falls	20,067	6
4600	25-May-07	Three Mile Lake	06-Oct-09	Bill Lake	58,387	6
4601	25-May-07	Three Mile Lake	08-Oct-09	Three Mile Lake	40,842	10
4602	25-May-07	Three Mile Lake	29-Aug-09	Namakan Lake	19,481	11
8491	30-Apr-08	Below Snake Falls	19-Oct-09	Three Mile Lake	13,364	3
8492	30-Apr-08	Below Snake Falls	10-Oct-09	Three Mile Lake	60,613	3
8493	02-May-08	Below Snake Falls	19-Oct-09	Three Mile Lake	39,855	4
8494	02-May-08	Below Snake Falls	20-Oct-09	Below Snake Falls	445,361	1
8495	14-May-08	Sand Point Lake	17-Jun-09	Namakan Lake	1,065	3
49630	20-May-08	Namakan Lake	28-May-09	Namakan Lake	26,285	10
49631	16-May-08	Little Vermillion Lake	21-Oct-09	Little Eva Lake	10,788	3
49632	15-May-08	Sand Point Lake	29-May-09	Namakan Lake	11,545	9
49633	21-May-08	Namakan Lake	27-Sep-09	Namakan Lake	44,370	9
49634	21-May-08	Namakan Lake	08-Jul-09	Namakan Lake	6,814	9
49635	20-May-08	Namakan Lake	30-Aug-09	Namakan Lake	36,447	10
49637	21-May-08	Namakan Lake	20-Jun-09	Namakan Lake	5,459	10

49638	20-May-08	Namakan Lake	18-Sep-09	Namakan Lake	13,160	1
49640	14-May-08	Sand Point Lake	19-Jun-09	Namakan Lake	30,579	12
49641	14-May-08	Sand Point Lake	21-Oct-09	Little Eva Lake	14,073	4
49642	07-May-08	Crane Lake	21-Oct-09	Little Eva Lake	23,984	3
49643	07-May-08	Crane Lake	02-Jun-09	Namakan Lake	26,891	8
49644	07-May-08	Crane Lake	01-Jun-09	Namakan Lake	6,905	10
49647	13-May-08	Sand Point Lake	21-Oct-09	Little Eva Lake	12,108	4
49650	15-May-08	Sand Point Lake	27-Aug-09	Namakan Lake	3	1
49652	14-May-08	Sand Point Lake	23-Oct-09	Namakan Lake	1,091	1
49653	14-May-08	Sand Point Lake	17-Aug-09	Namakan Lake	10,808	10
Total	52	-	-	-	2,448,176	-
Mean	-	-	-	-	47,080	5.75

Table 8: Movements of lake sturgeon through undeveloped rapids/falls in the Namakan River, Ontario from May 15, 2007 to Oct. 23, 2009. Locations are listed from downstream to upstream, and proposed hydro development sites are in bold

Location	Elevation ¹ (m)	Upstream	Downstream	Total
Lady Rapids	1.6	42	52	94
Hay Rapids	3.0	43	43	86
Back Channel (Eva Island)	7.0	23	5	28
High Falls	6.8	0	20	20
Quetico Rapids	0.7	37	40	77
Quetico River (QPP)	-	8	8	16
Twisted Rapids	-	45	45	90
Bearpelt Creek (QPP)	-	3	3	6
Ivy/Myrtle Falls	4.0	15	17	32
Ivy Falls ²	-	0	6	6
Myrtle Falls ²	-	0	4	4
Side Channel	-	7	0	7
Snake Falls	3.2	0	0	0

¹ change in elevation at an average flow of 120 m³/sec.

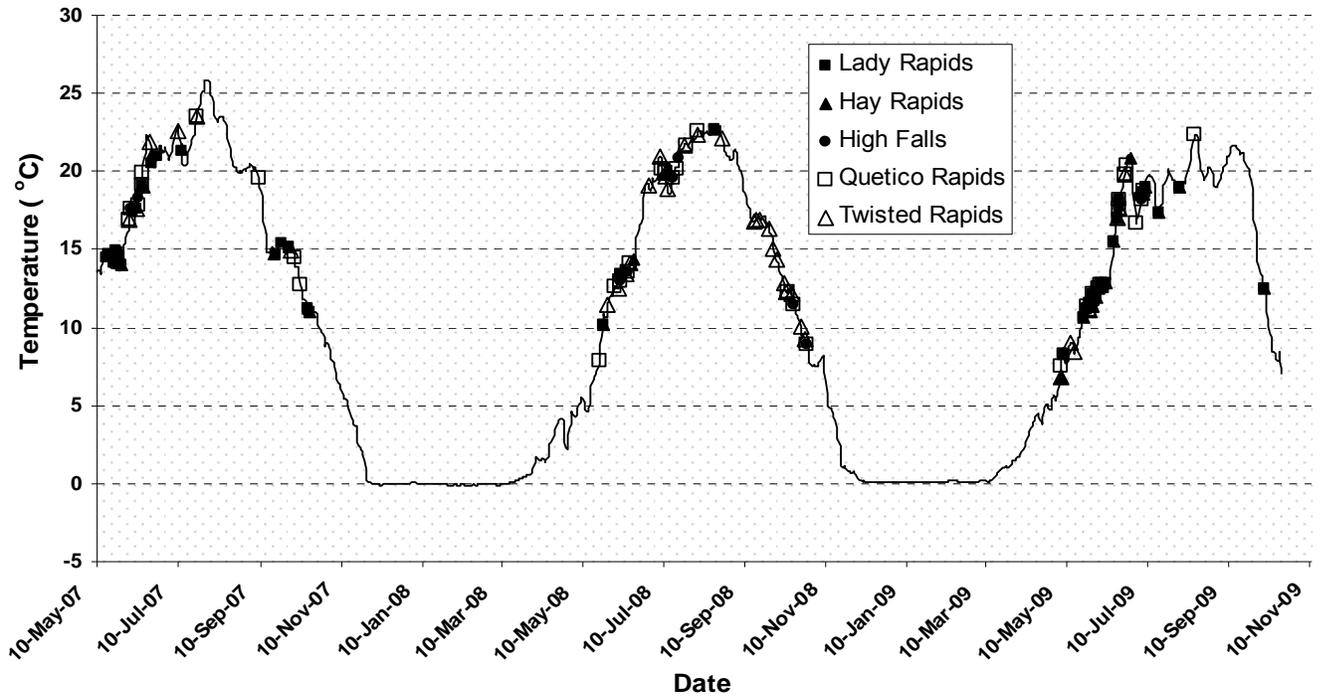
² site-specific movements since additional receivers were deployed in May, 2009

Table 10: Mean and range of water flows for lake sturgeon movements through undeveloped rapids/falls in the Namakan River, Ontario from May 15, 2007 to Oct. 23, 2009. Locations are listed from downstream to upstream, and proposed hydro development sites are in bold.

Location	Downstream			Upstream		
	n	Mean (m ³ /s)	Range (m ³ /s)	n	Mean (m ³ /s)	Range (m ³ /s)
Lady Rapids	52	201	44 - 464	42	210	67 - 407
Hay Rapids	43	238	54 - 464	43	204	67 - 411
Back Channel¹	5	23	9-31	23	22	9-31
High Falls	20	269	64 - 406	0	-	-
Quetico Rapids	40	238	36 - 467	37	264	33 - 464
Twisted Rapids	45	211	61 - 446	45	205	55 - 444
Ivy/Myrtle Falls	7	300	109 - 409	8	396	313 - 464
Ivy Falls	6	236	54 - 288	0	-	-
Myrtle Falls	4	198	51 - 385	0	-	-
Side channel	0	-	-	7	318	282-394

¹ Flows in Back Channel represent values converted from the Namakan River outflow and the flow distribution reported by OPEG, 2009 (Genivar - Technical Note #2, Revision 3.0). All other values represent outflows reported from Lac La Croix (05PA006).

A)



B)

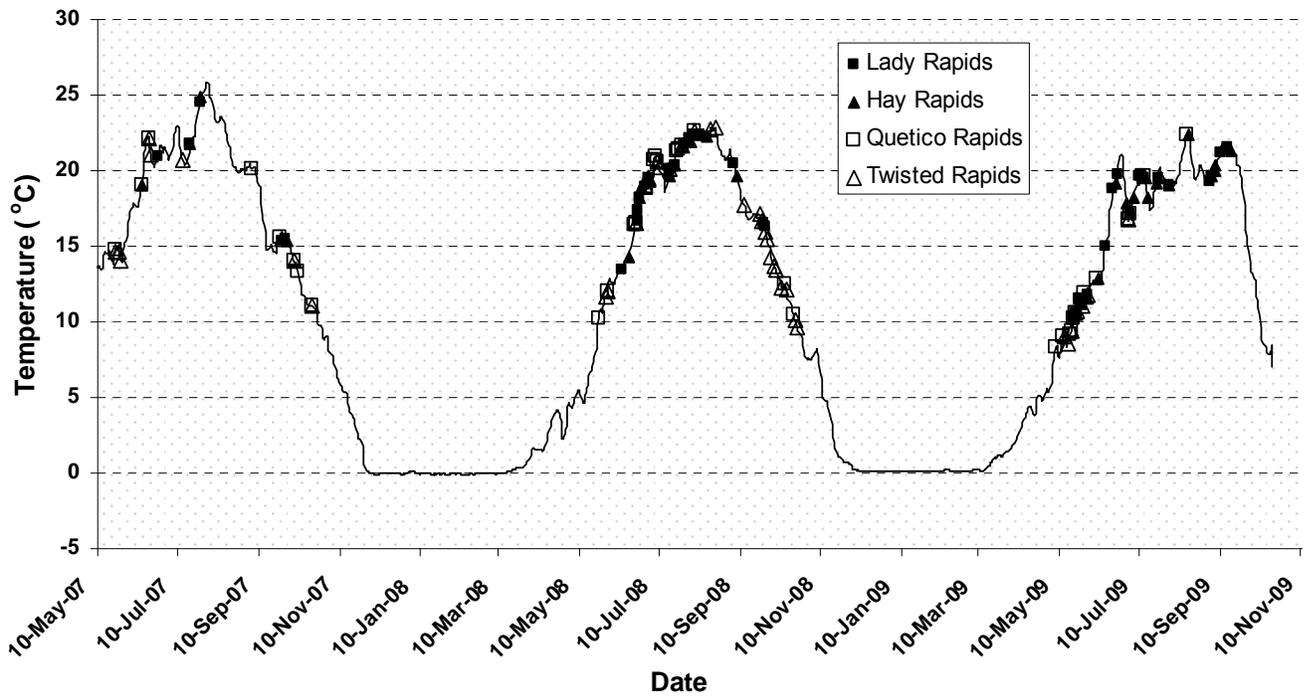
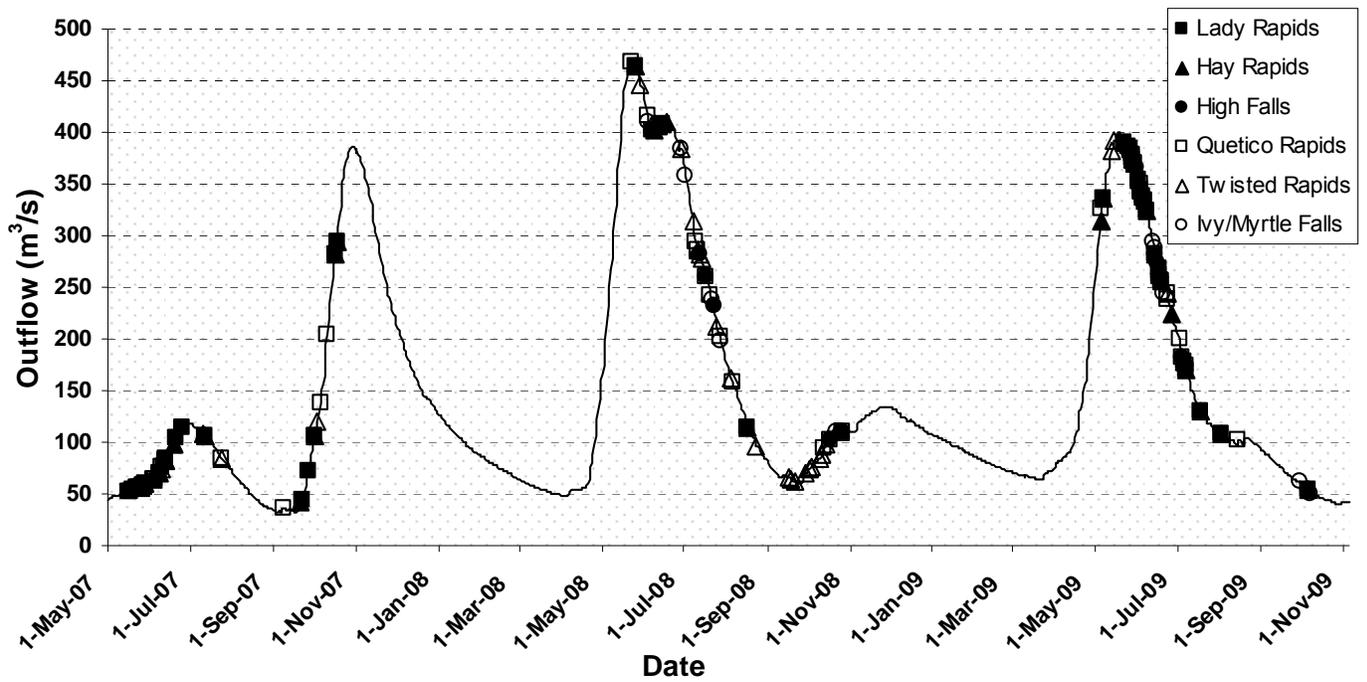


Figure 5: Downstream (A) and upstream (B) movement of lake sturgeon in relation to mean daily temperature through undeveloped rapids/falls in the Namakan River.

A)



B)

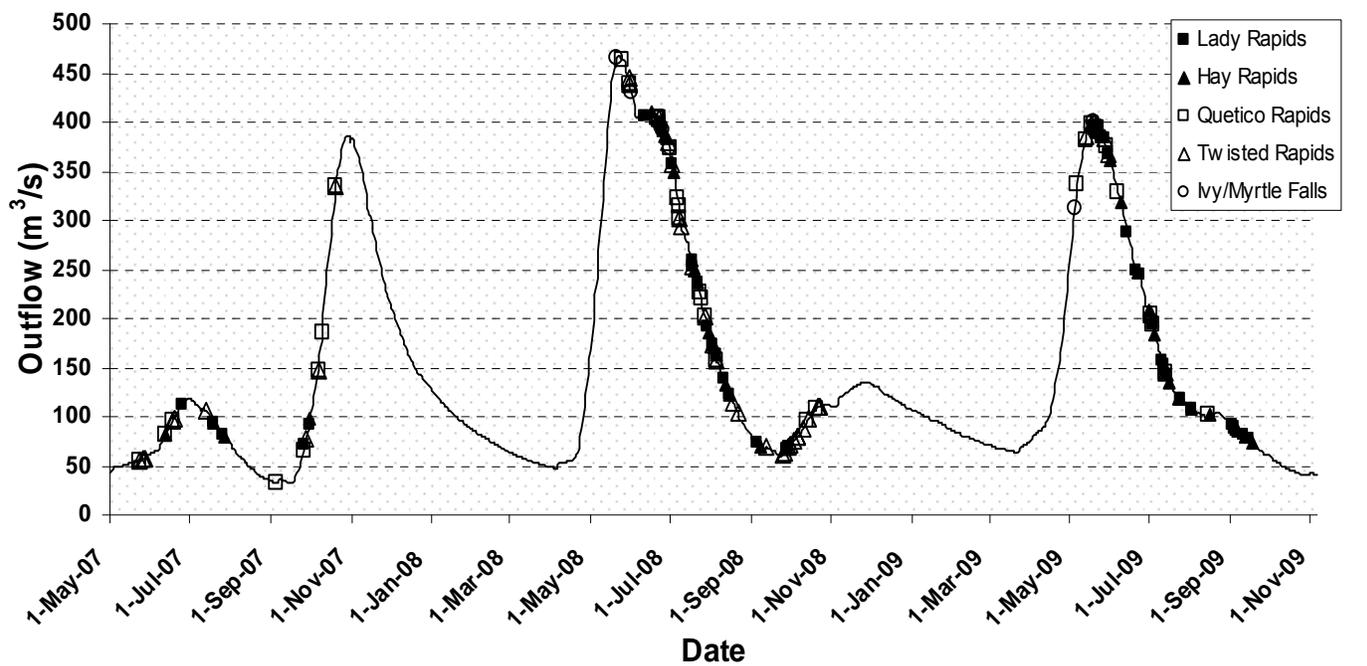
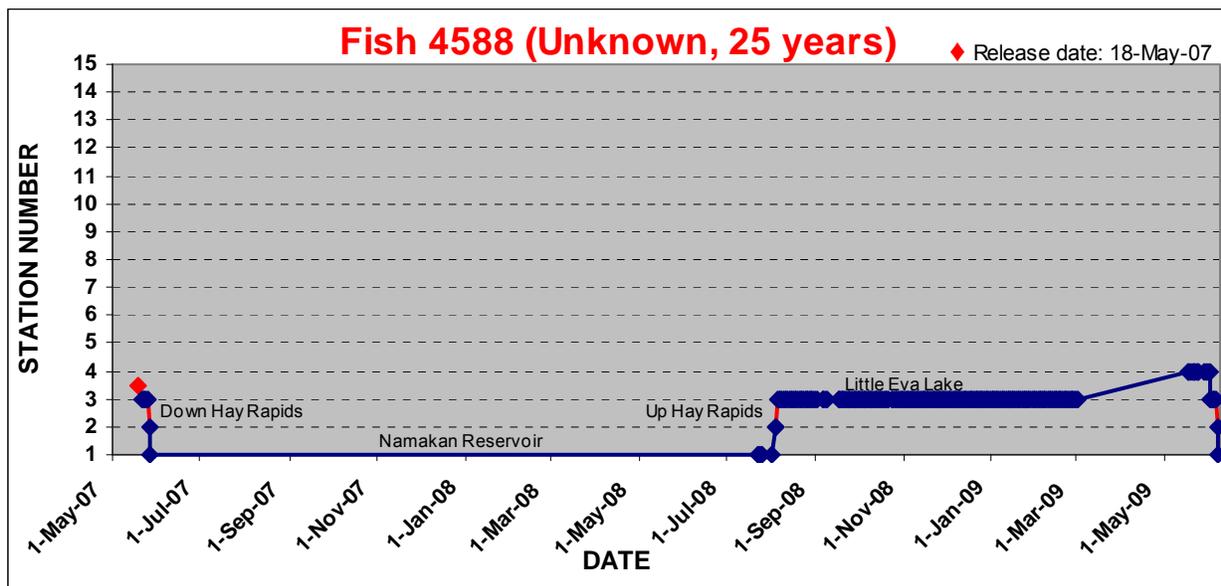
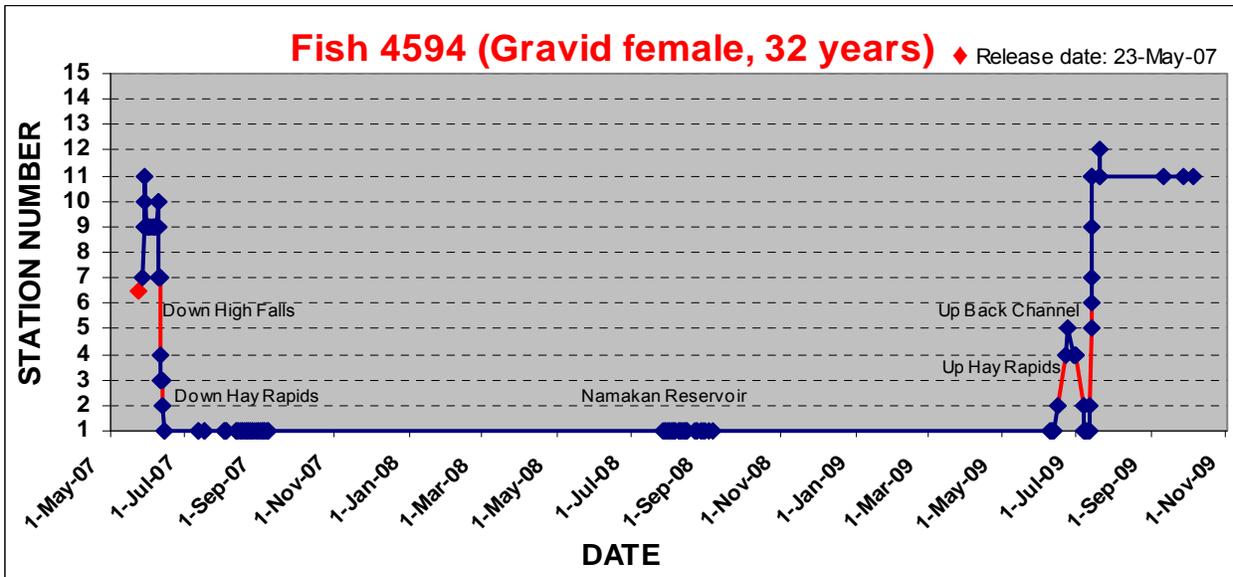
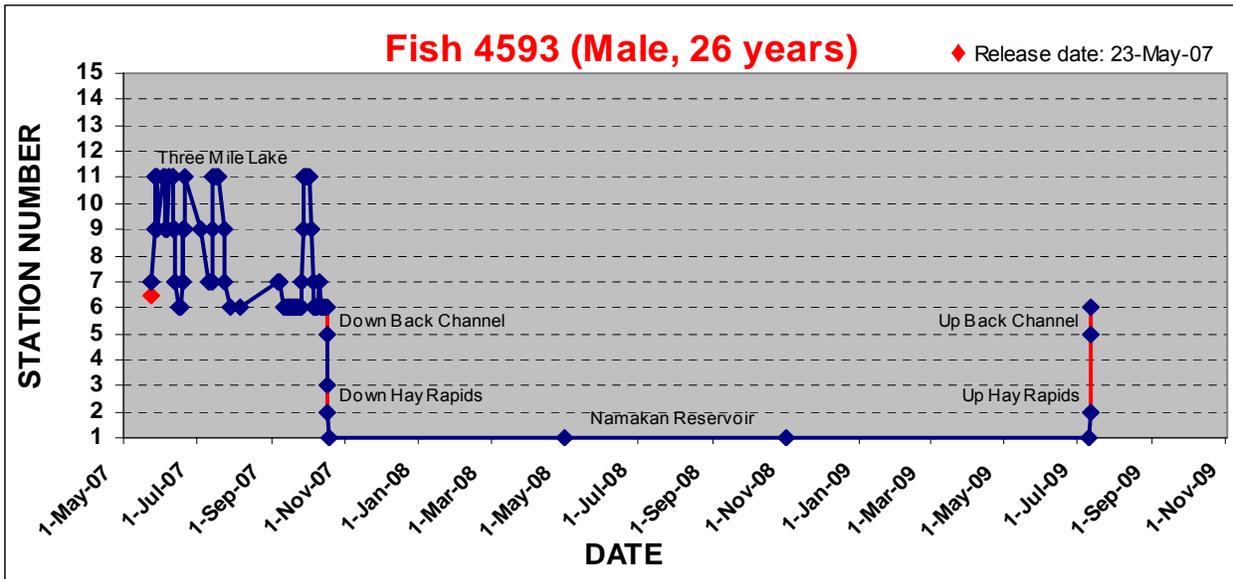
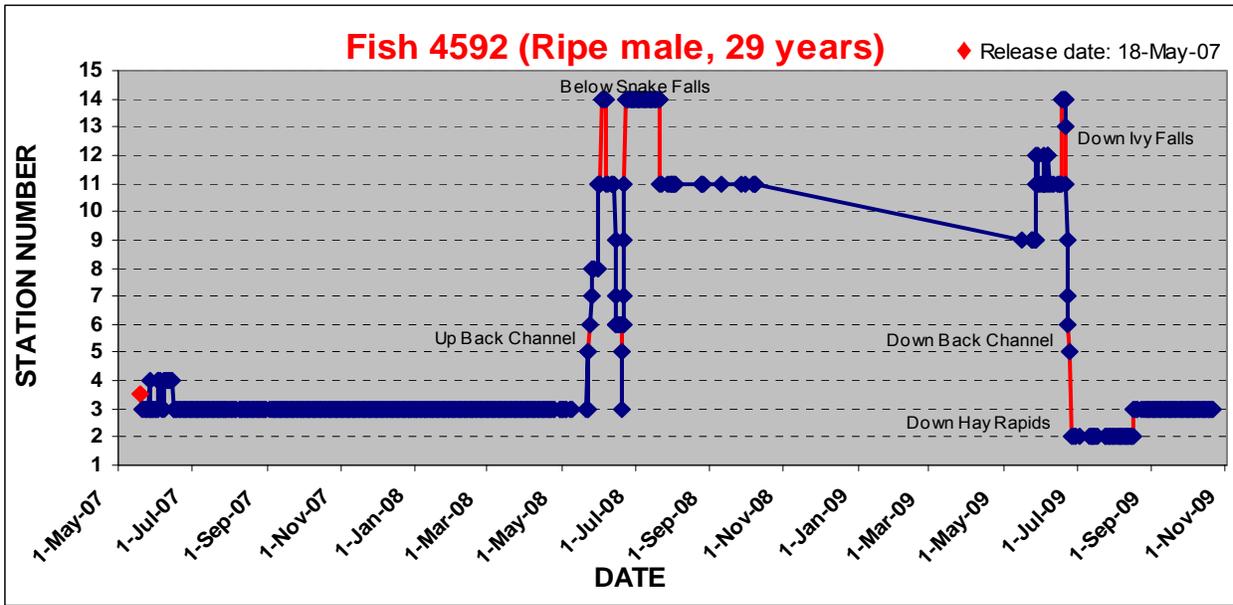


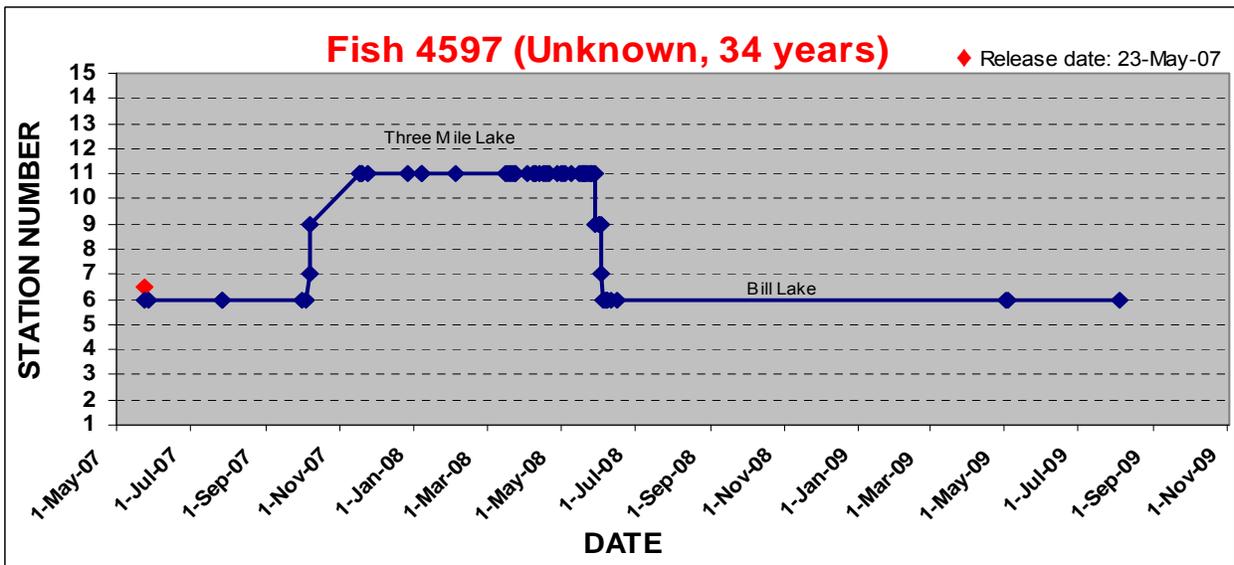
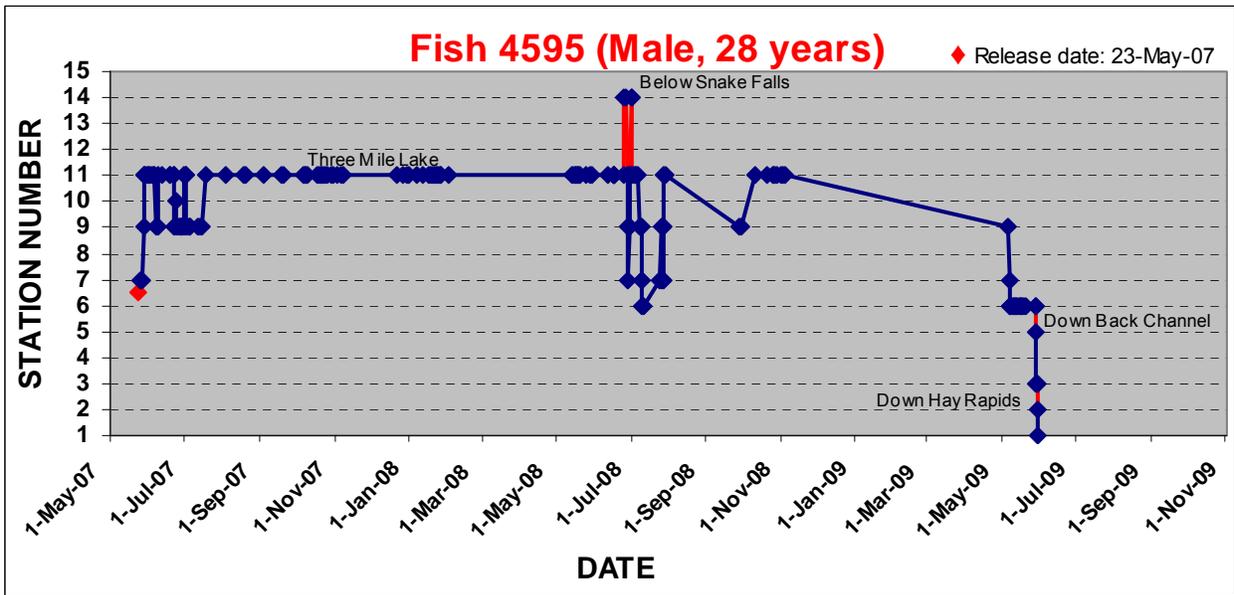
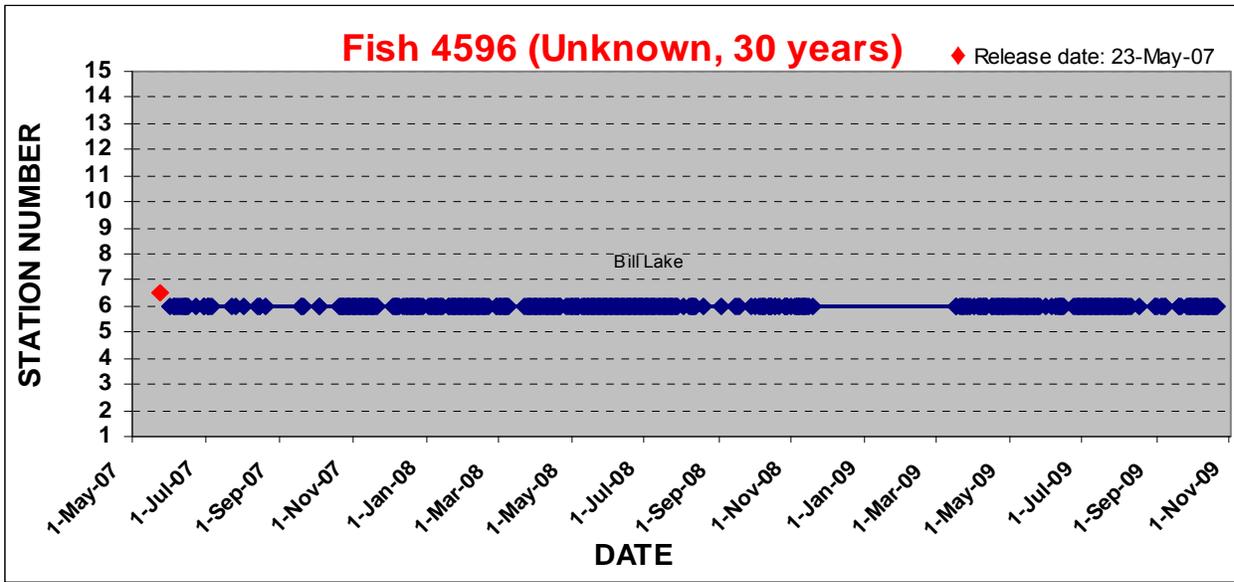
Figure 6: Downstream (A) and upstream (B) movement of lake sturgeon in relation to mean daily outflow through undeveloped rapids/falls in the Namakan River.

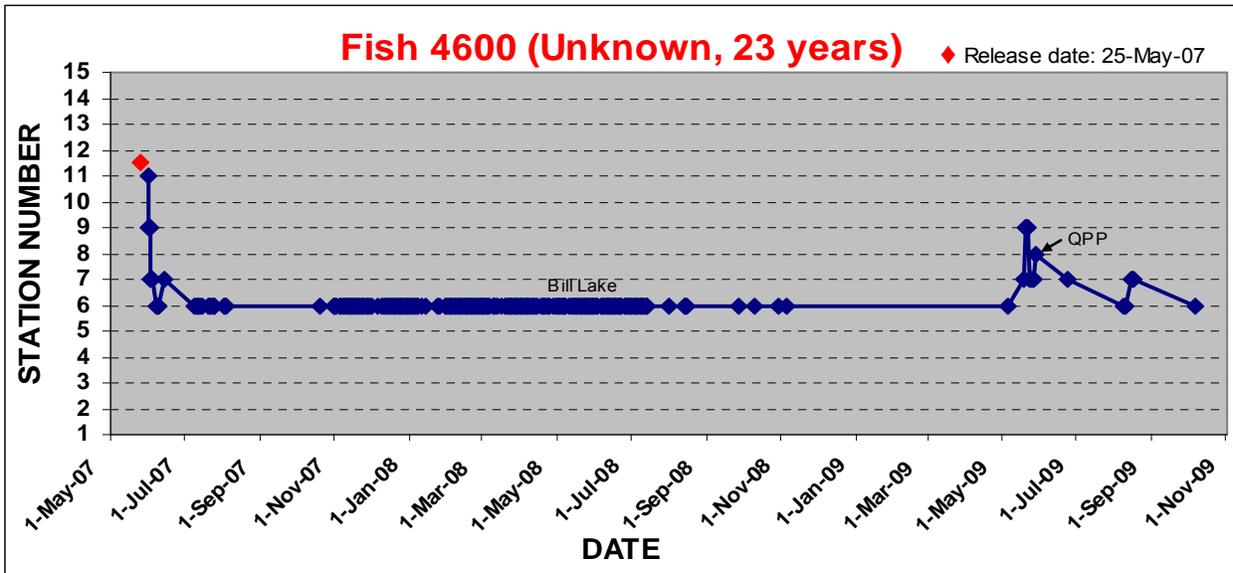
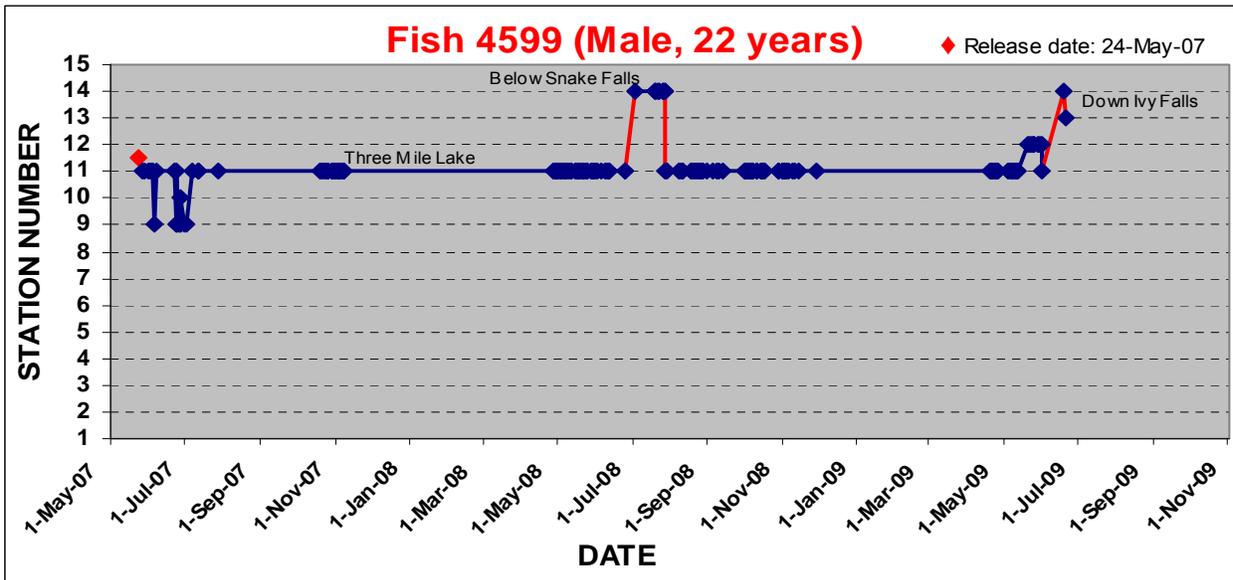
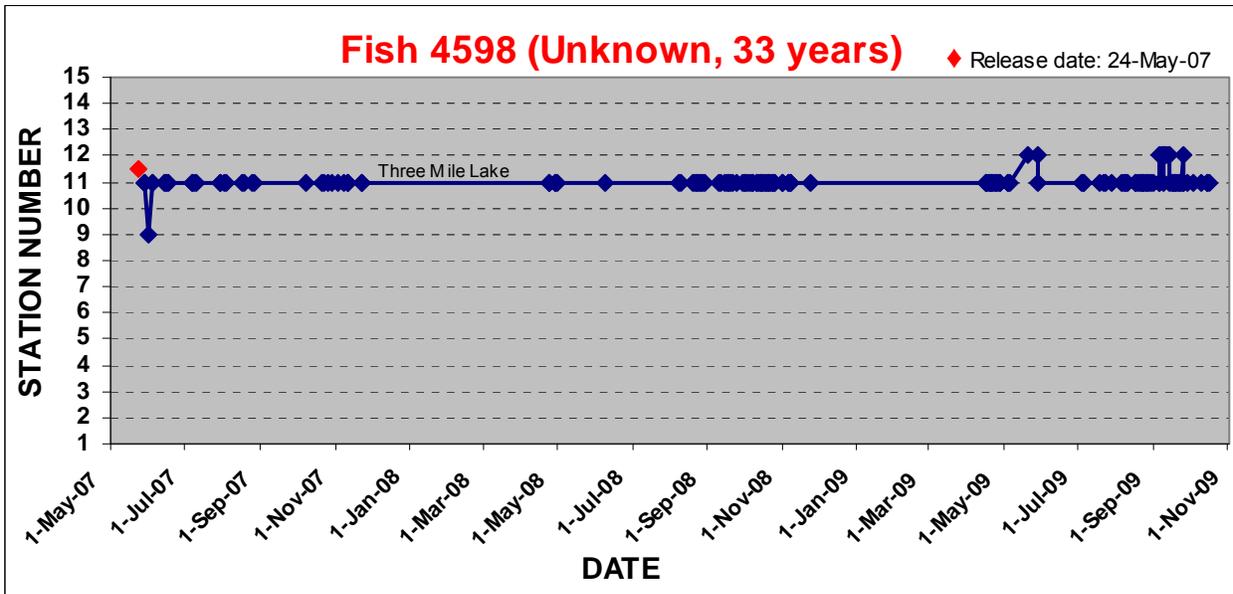
Appendix I: Movement of individual lake sturgeon released in 2007 within the Namakan River, Ontario.

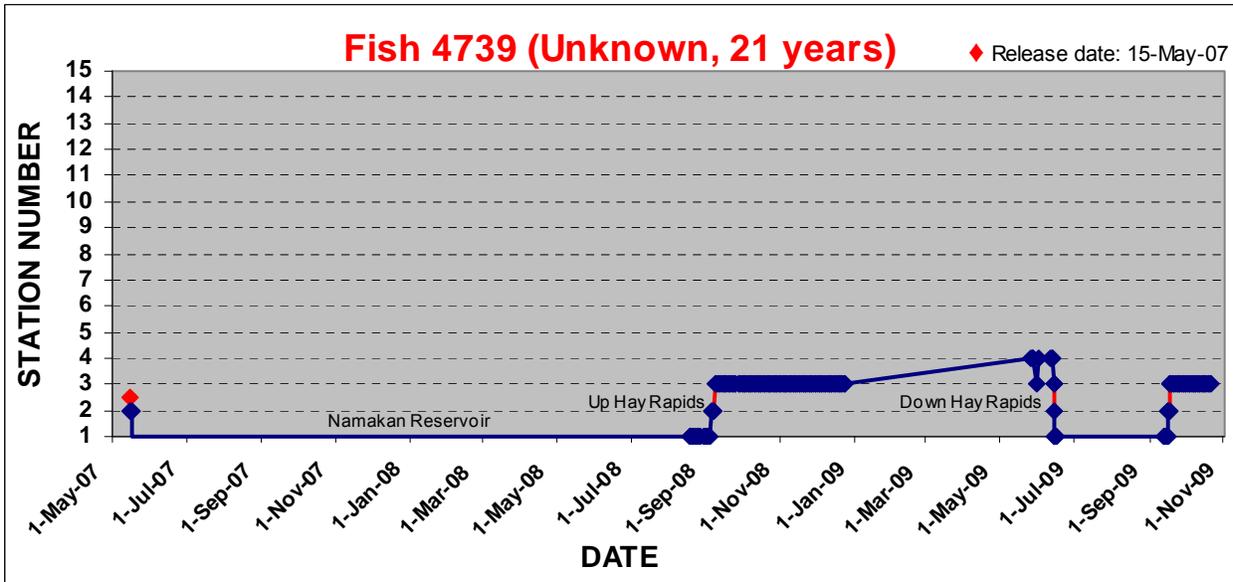
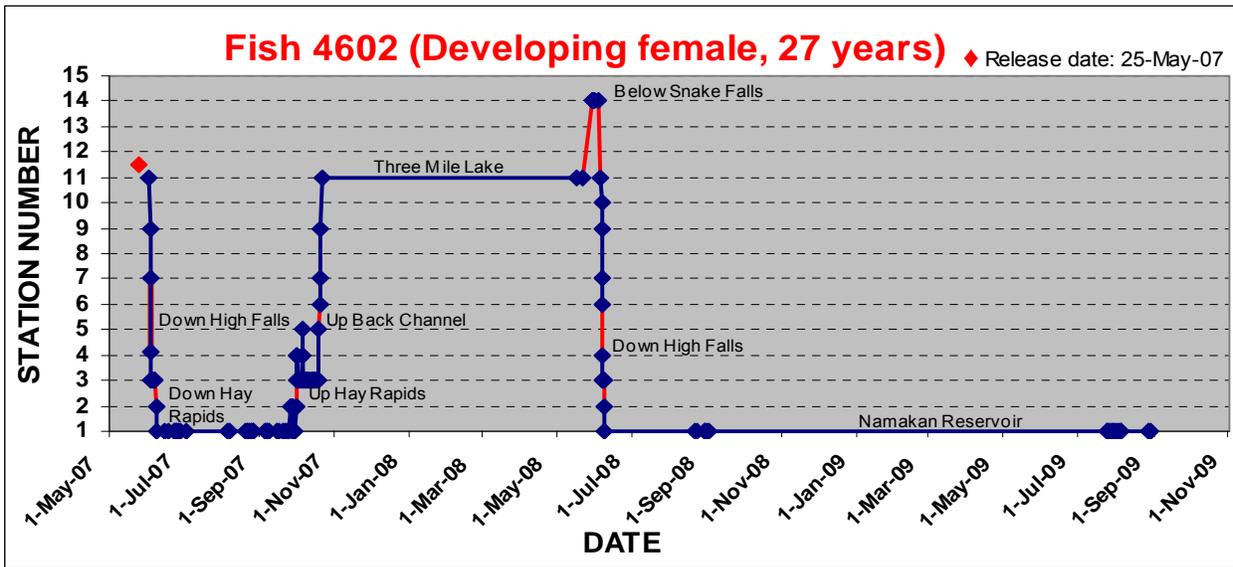
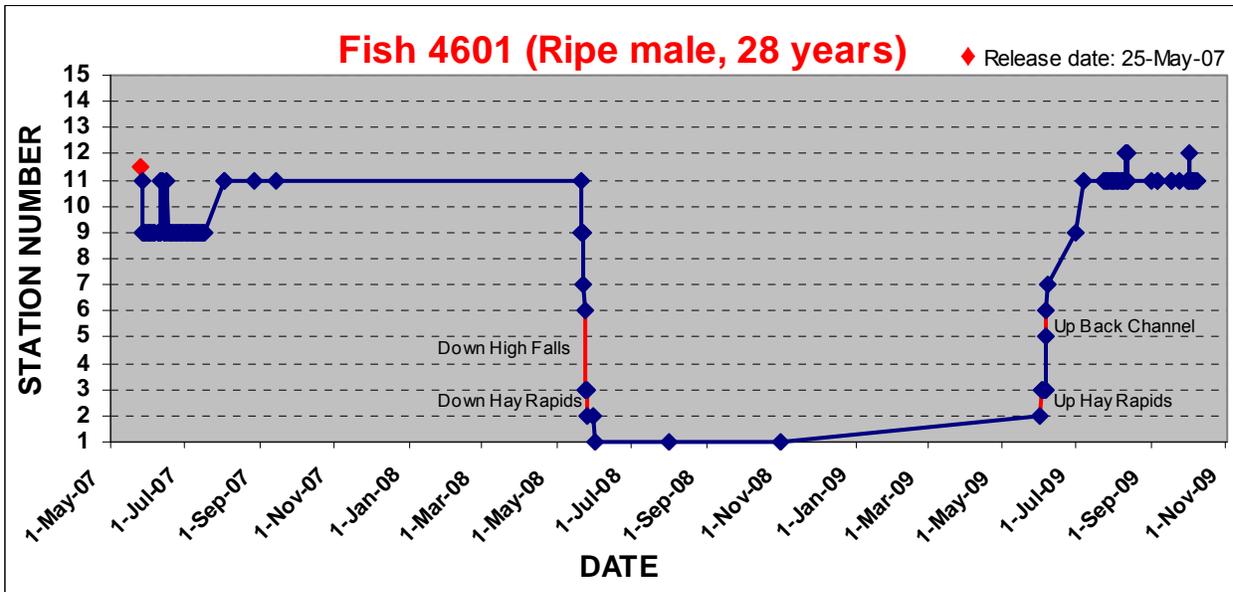
<u>Station #</u>	<u>Location Name</u>
15	Above Snake Falls
14	Below Snake Falls
13	Above Ivy Falls
12	Below Myrtle Falls
11	Below Ivy/Myrtle Falls (Three Mile Lake)
10	Bearpelt Creek
9	Below Twisted Rapids
8	Quetico River
7	Above Quetico Rapids
6	Above Back Channel (Bill Lake)
5	Lower Back Channel
4	Below High Falls
3	Above Hay Rapids (Little Eva Lake)
2	Below Hay Rapids
1	Below Lady Rapids (Namakan Lake)

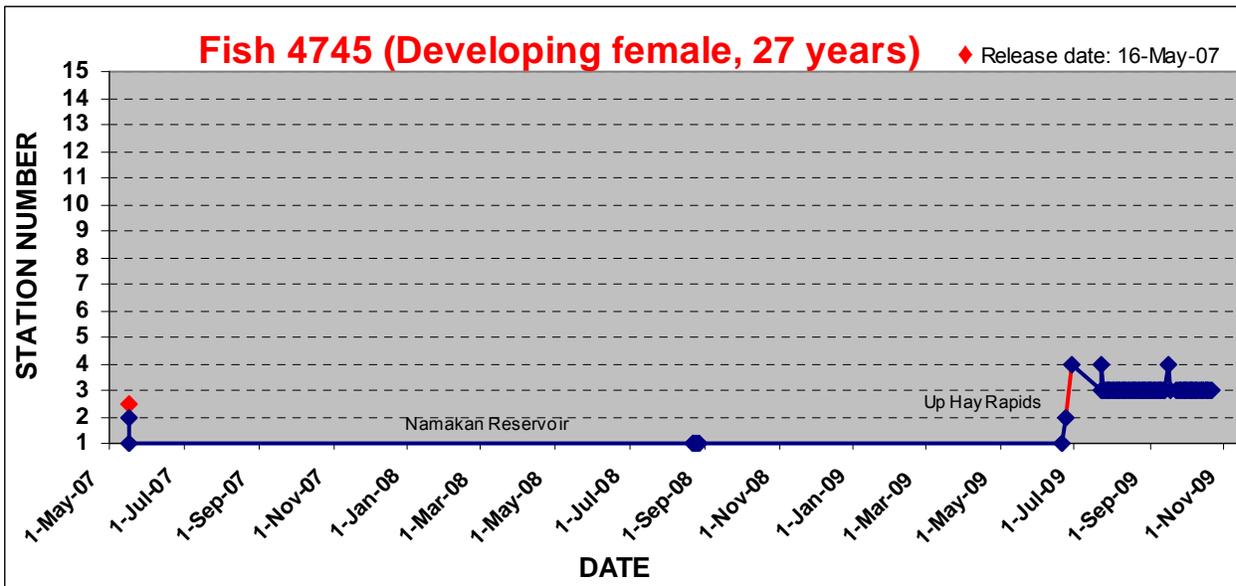
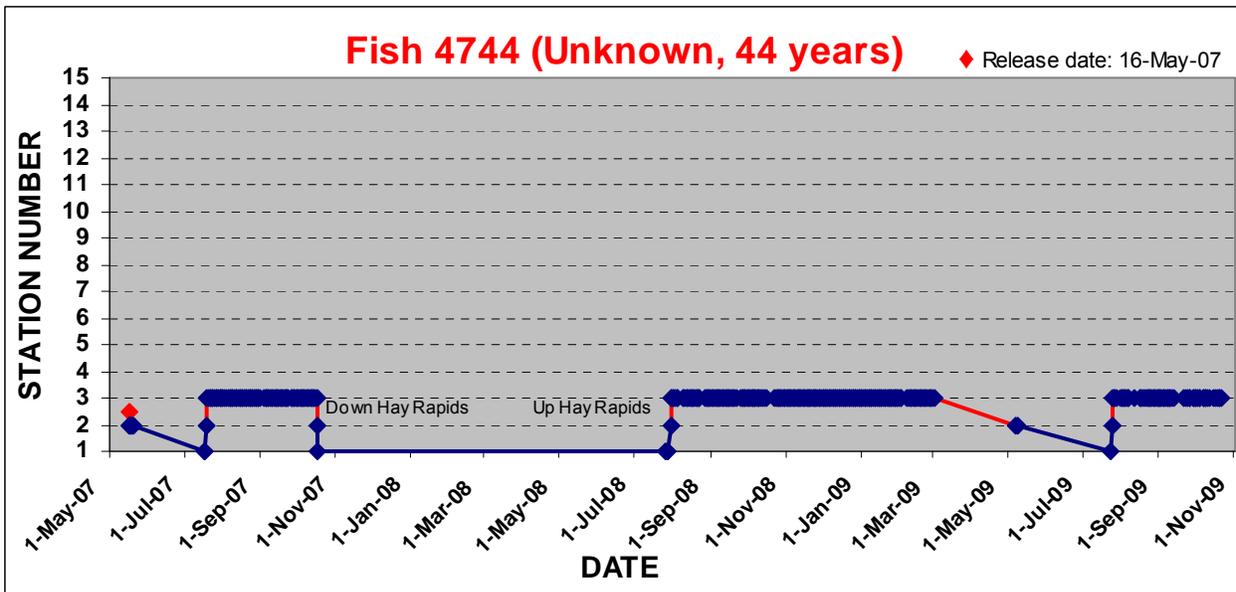
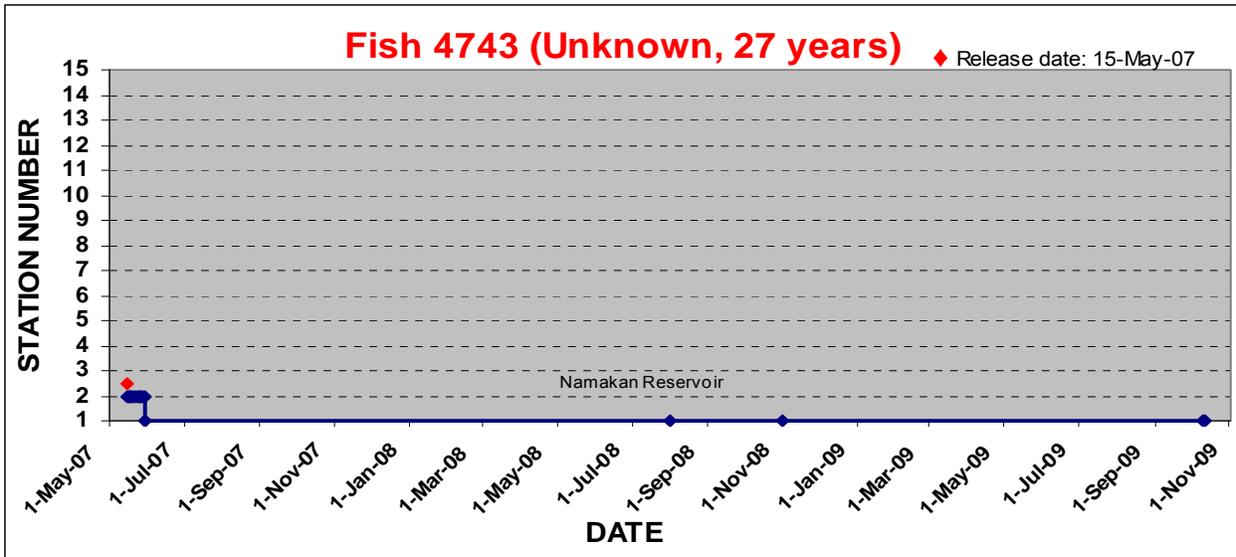


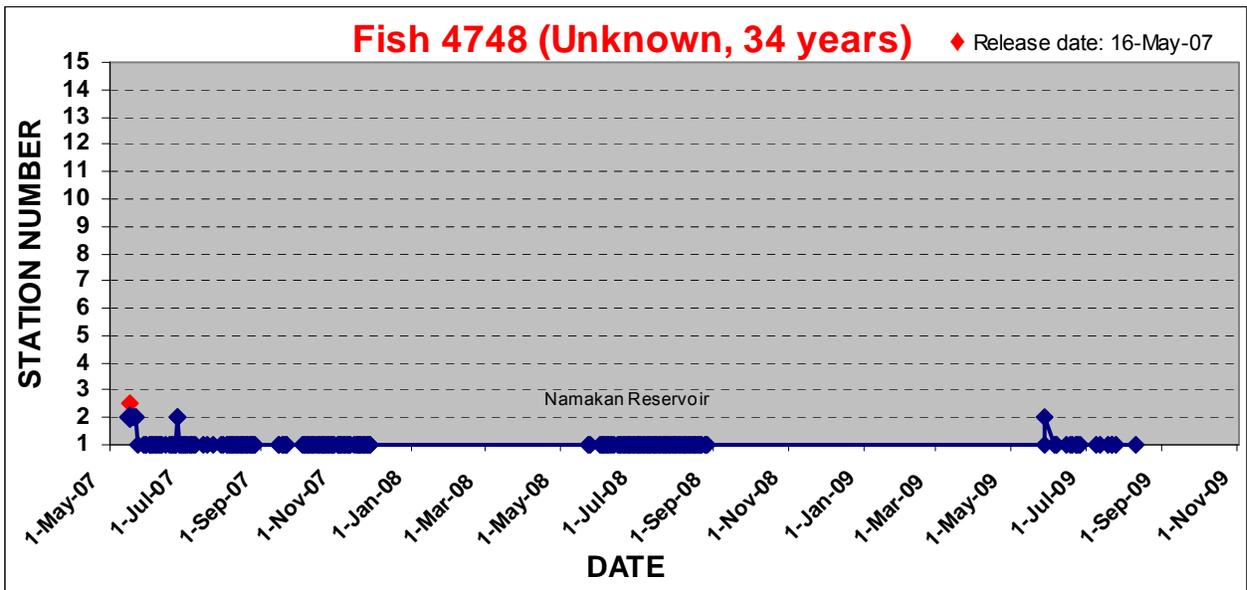
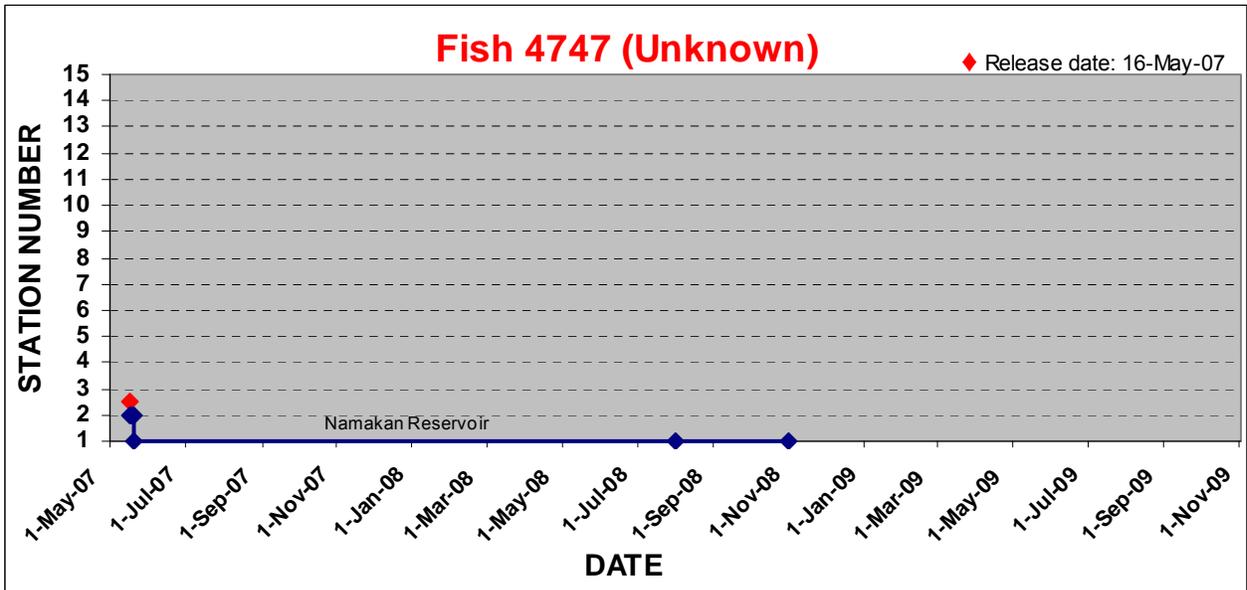
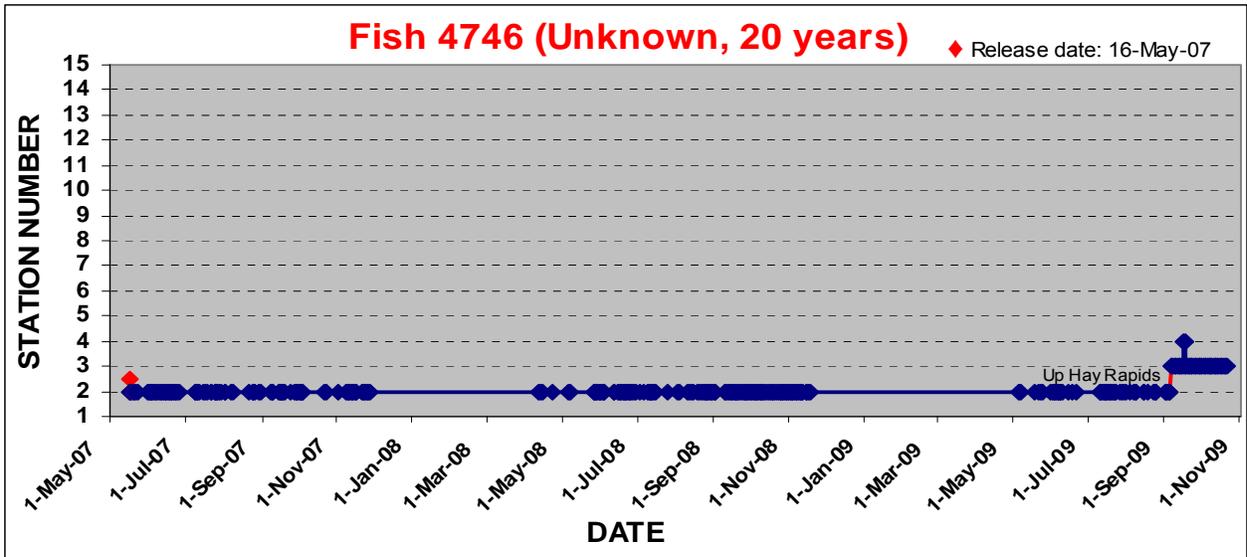


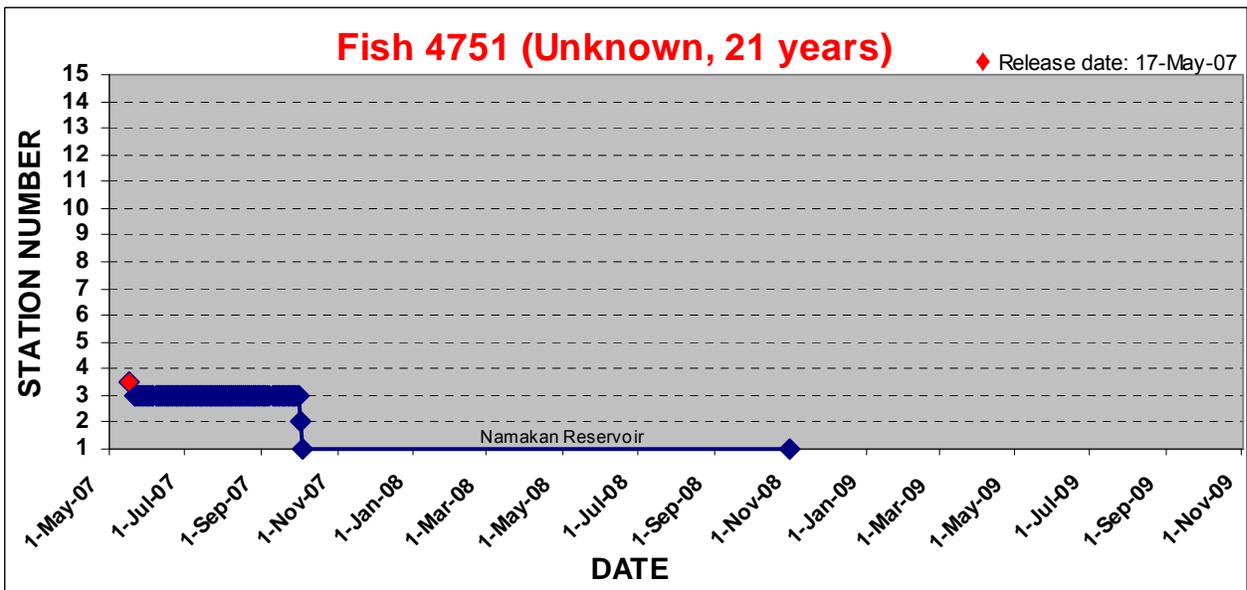
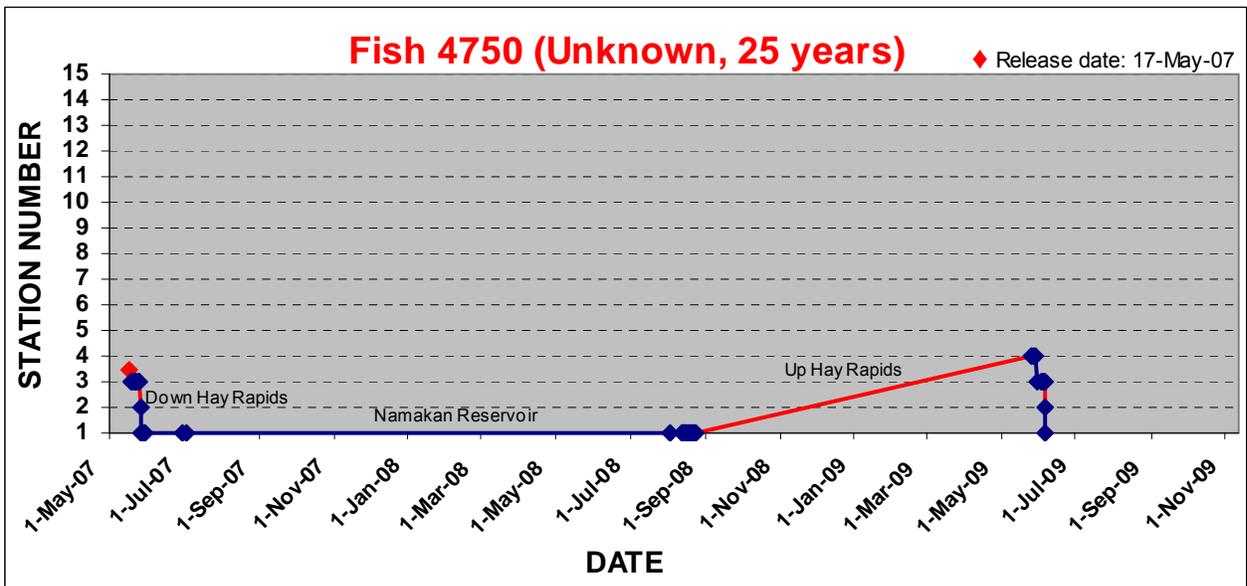
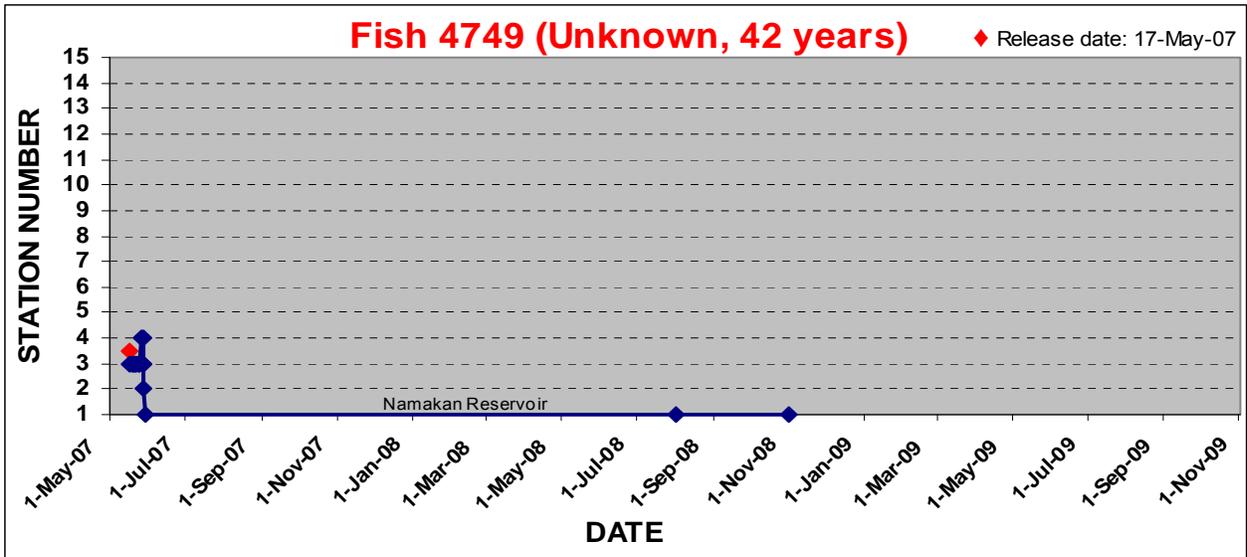


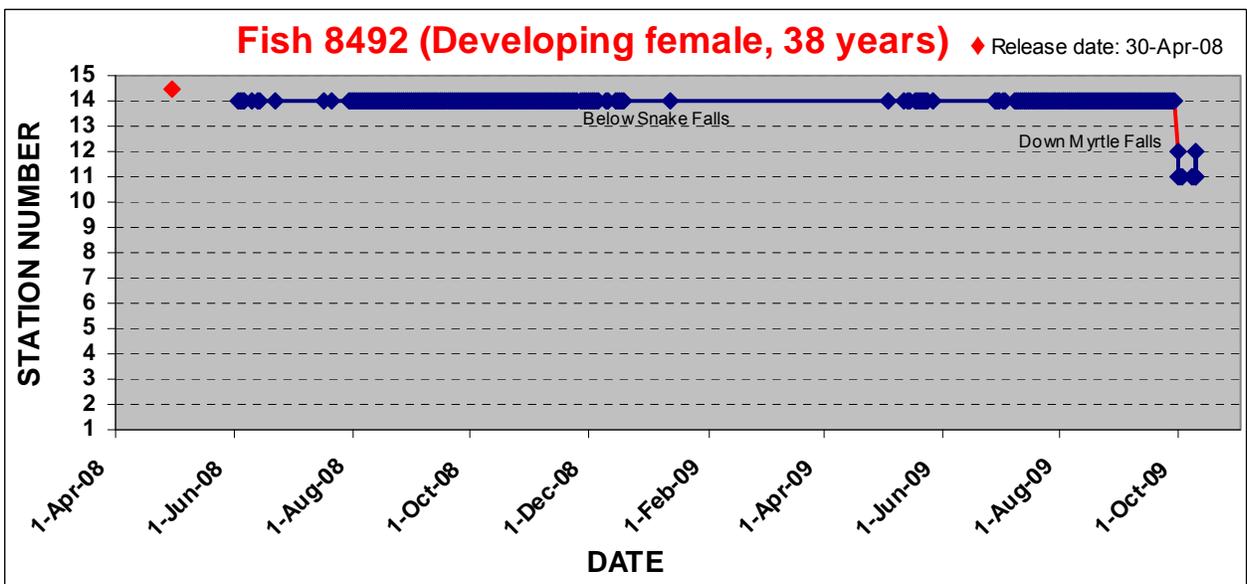
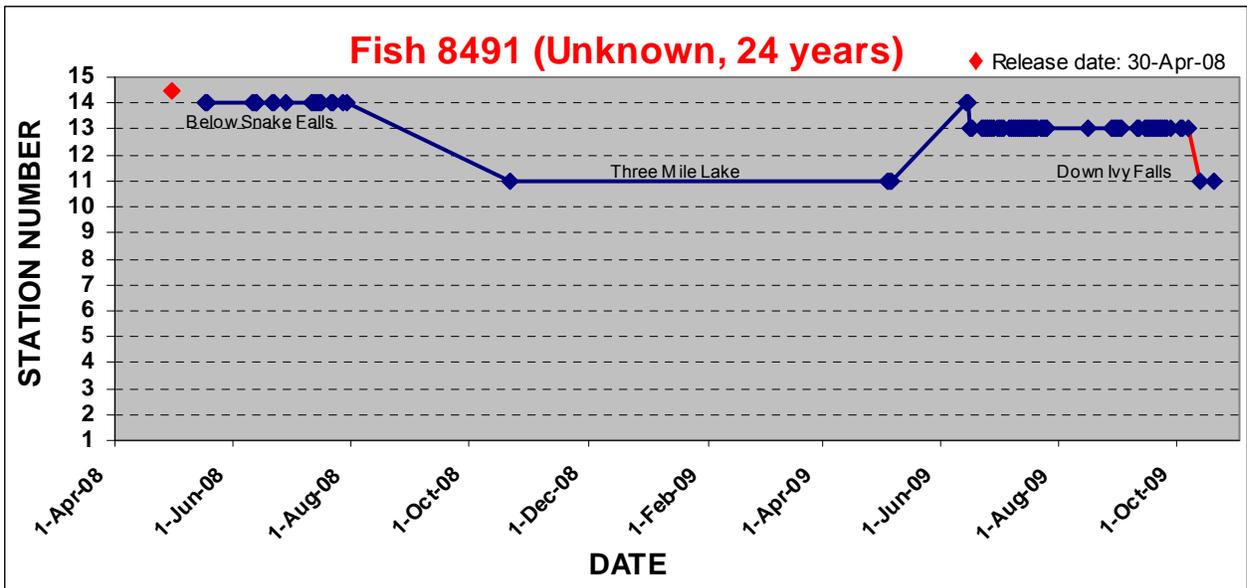
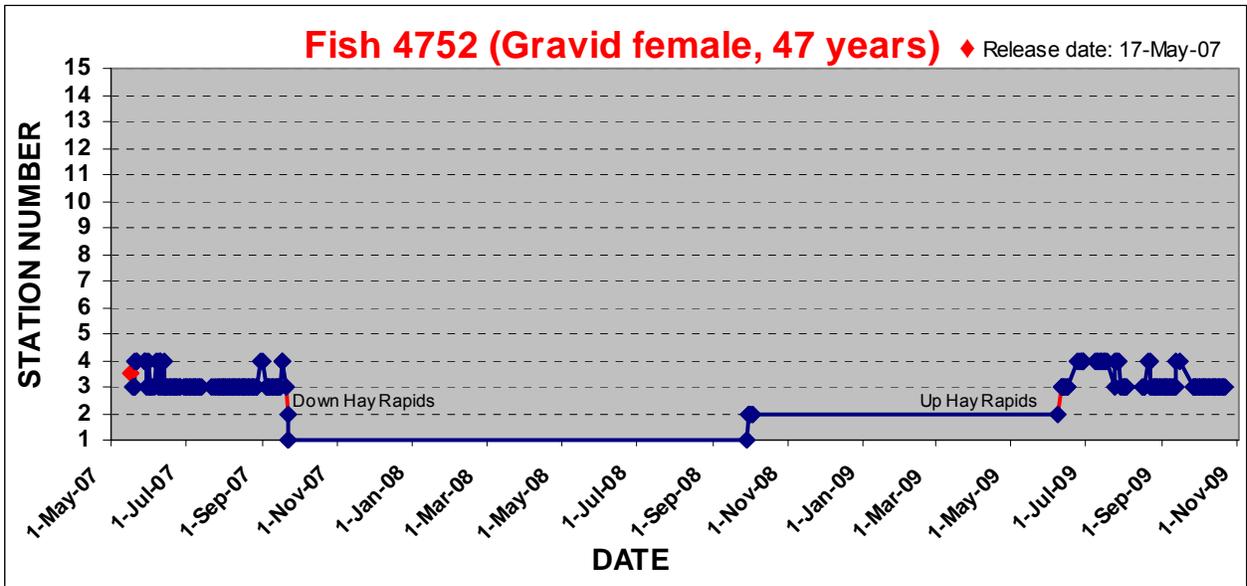


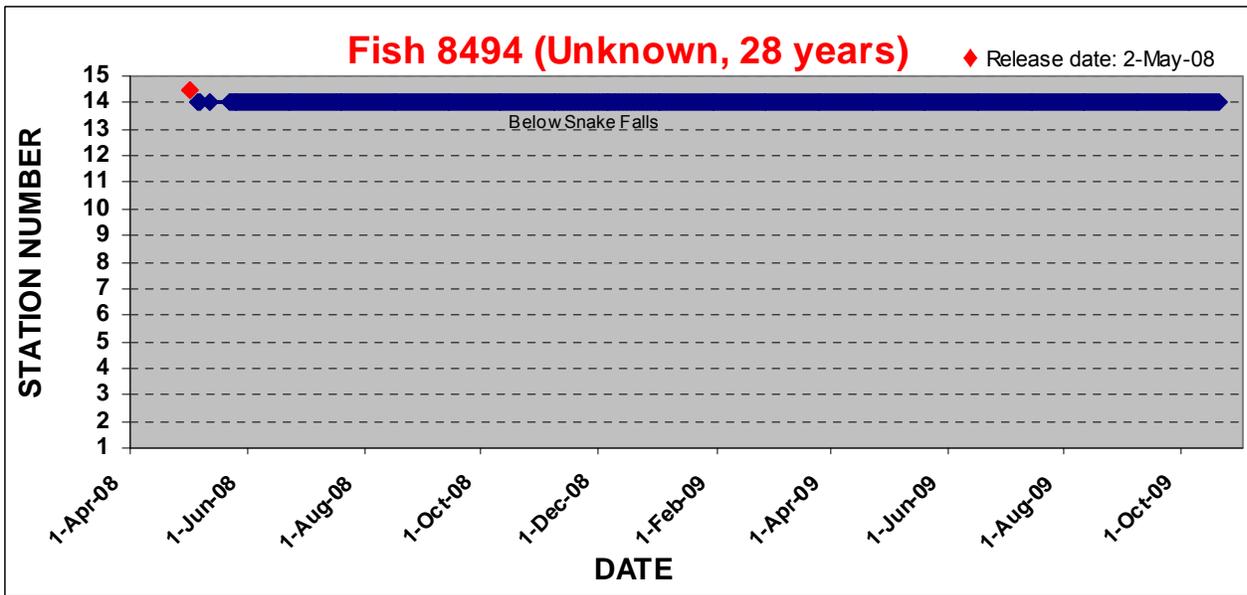
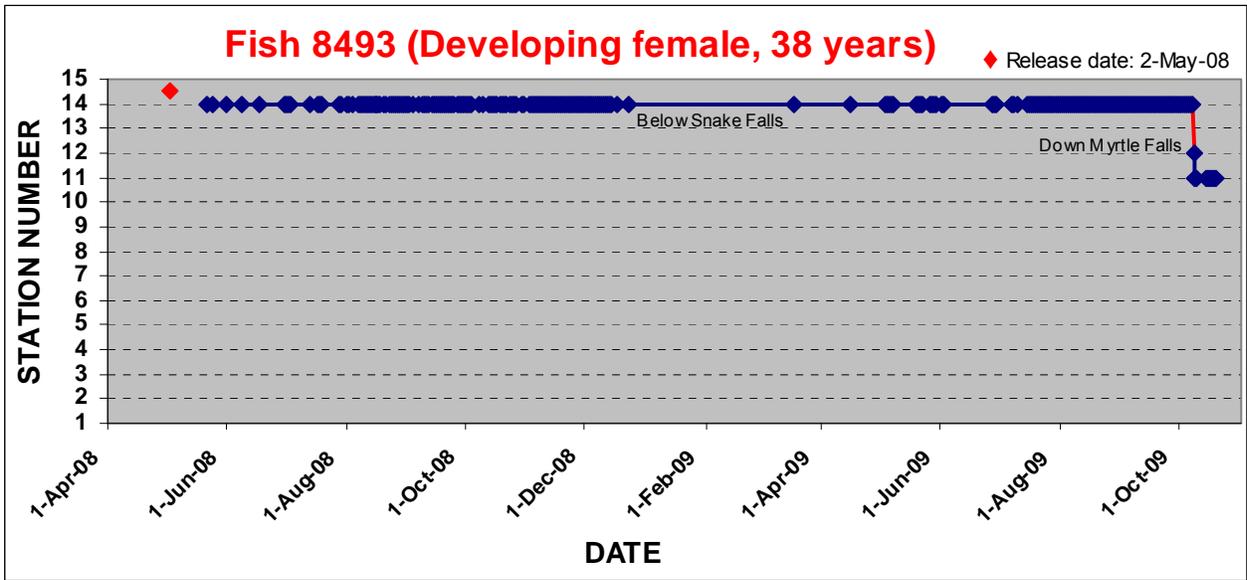






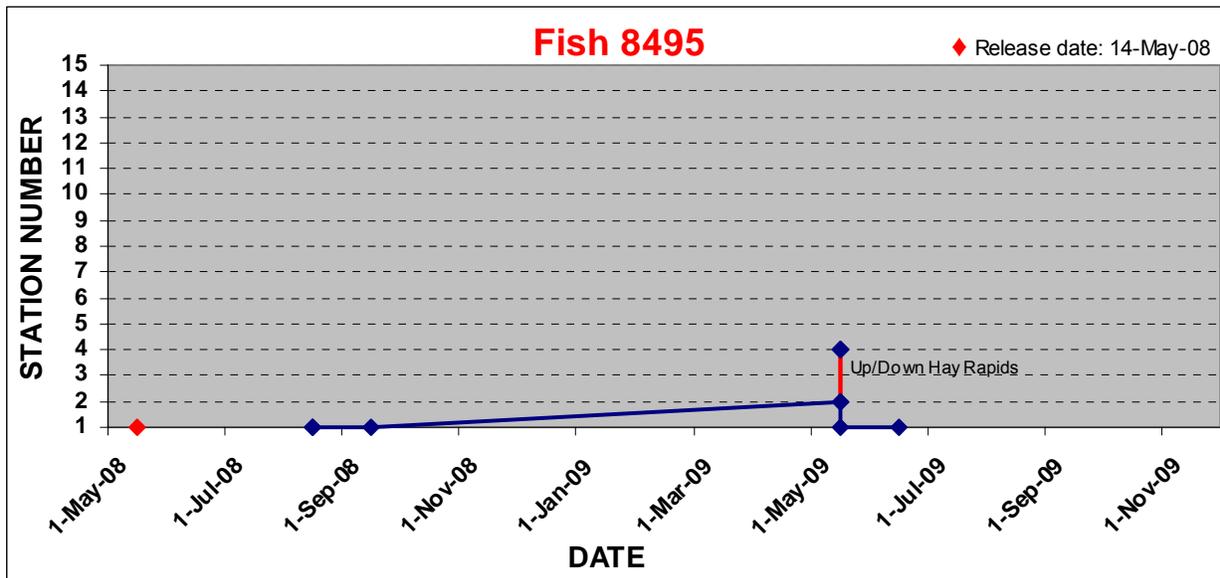


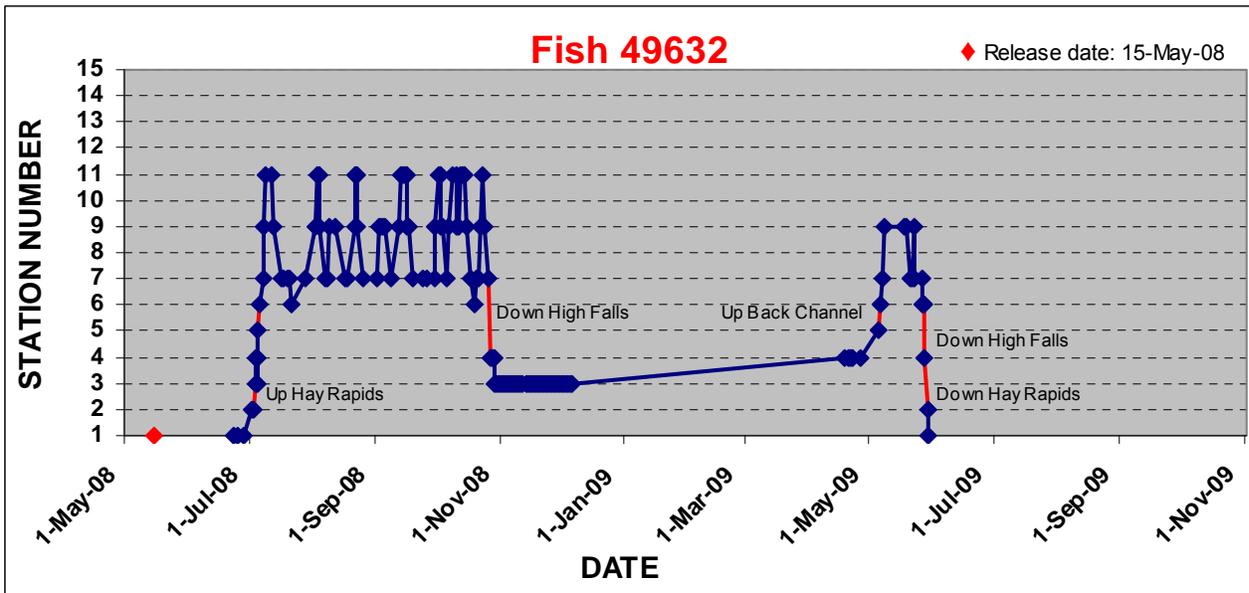
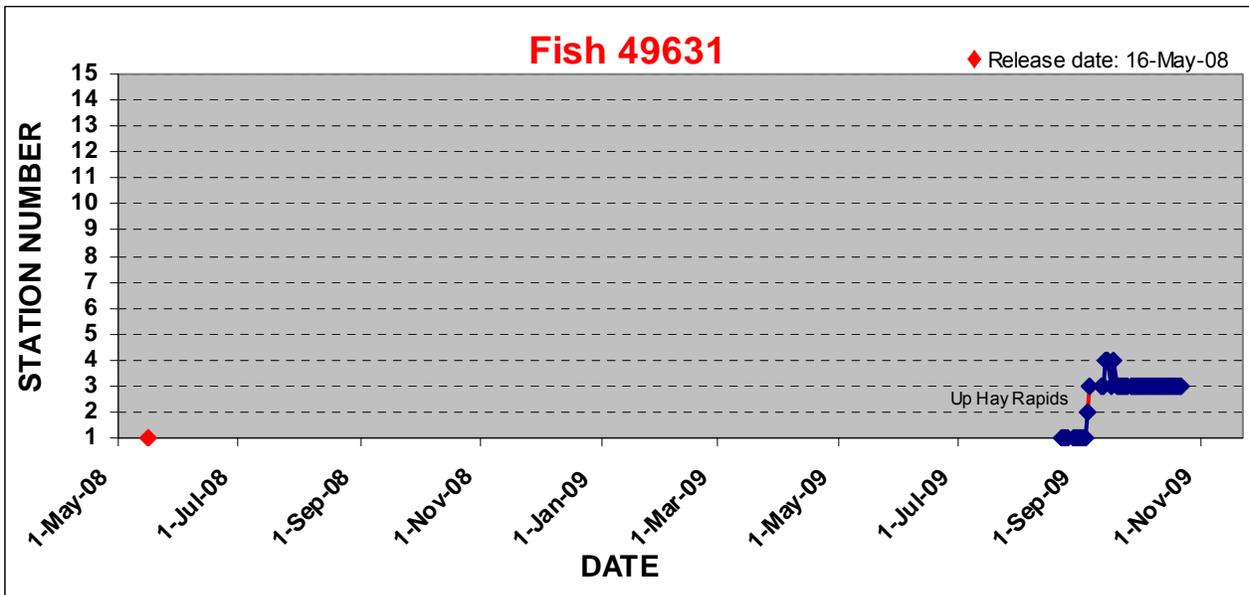
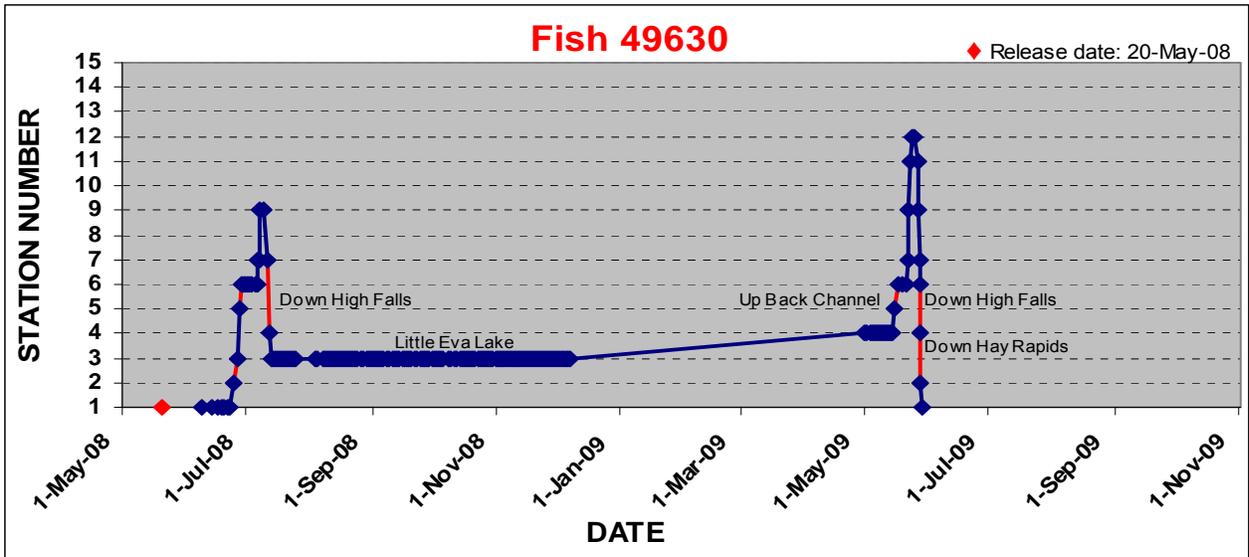


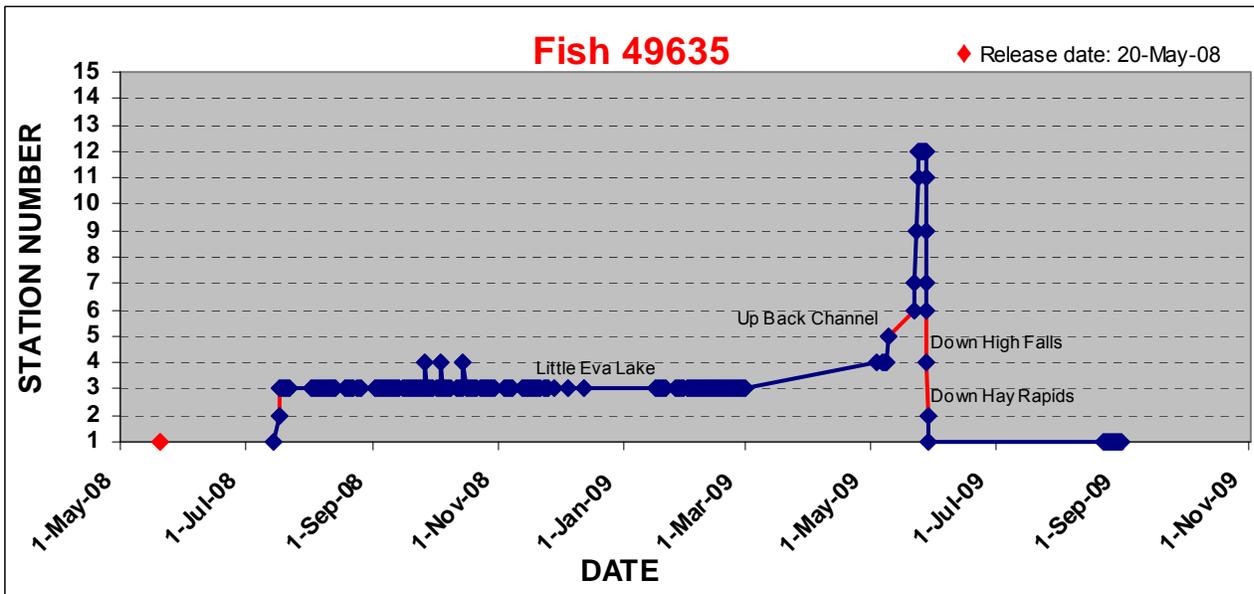
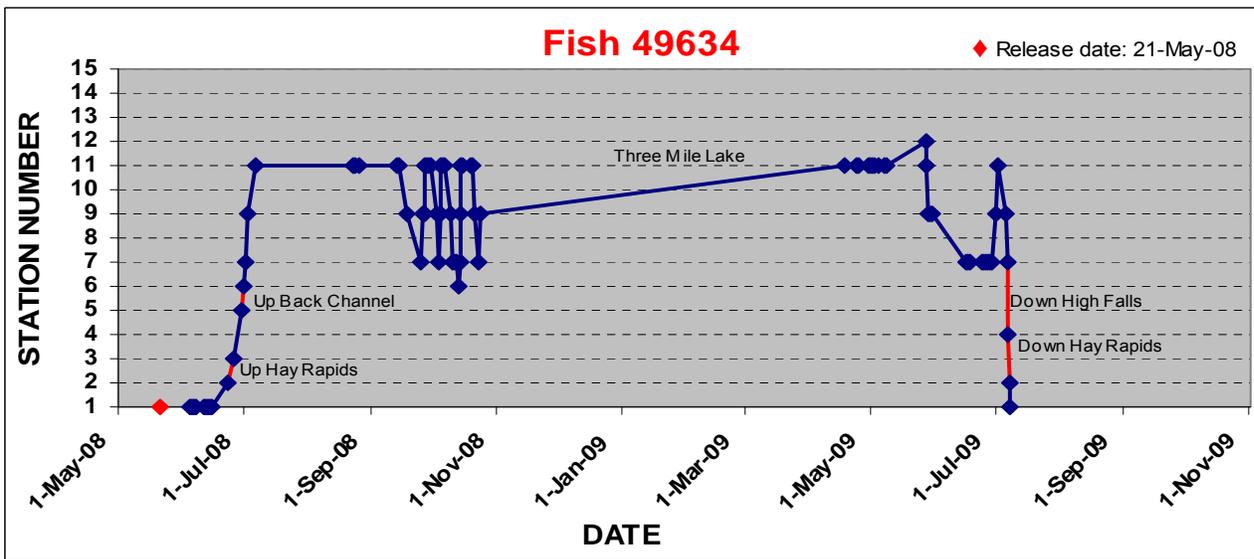
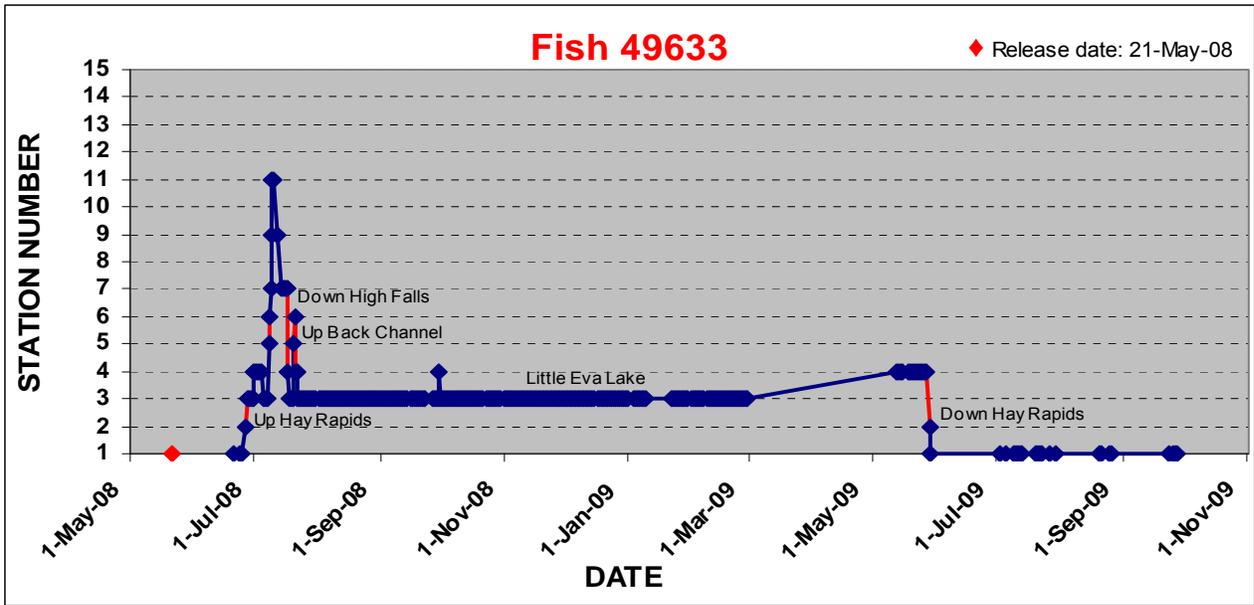


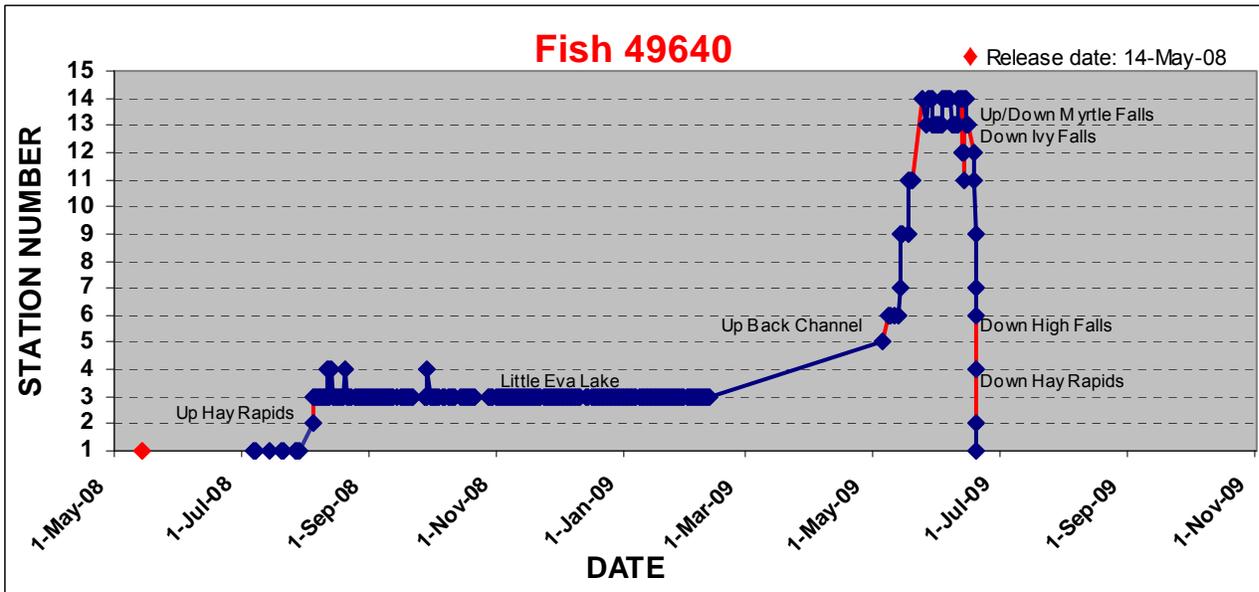
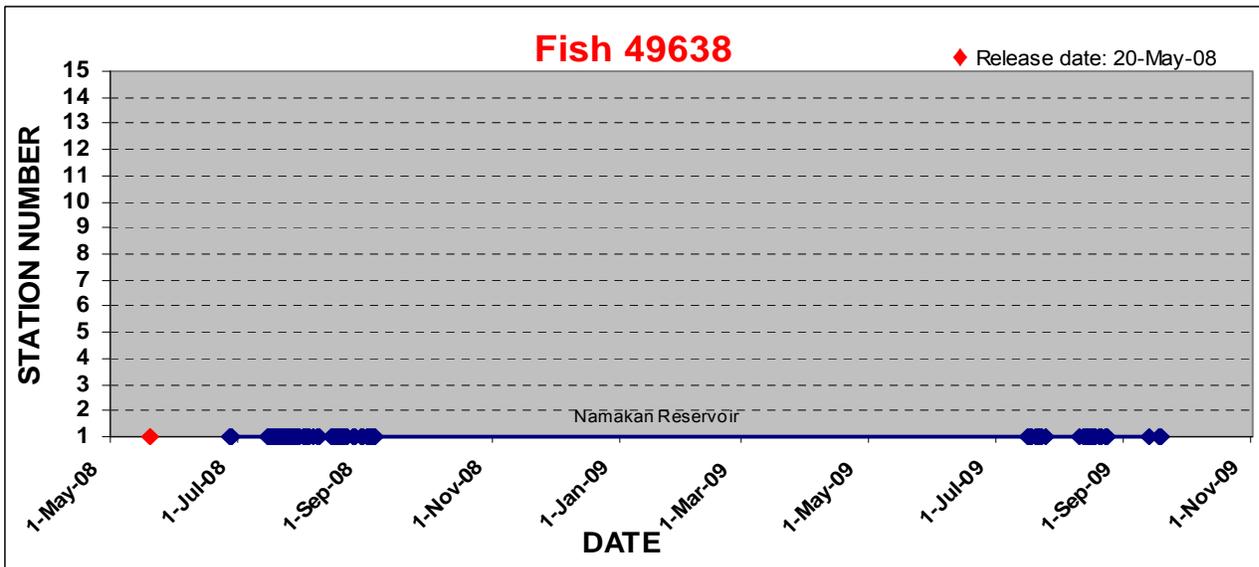
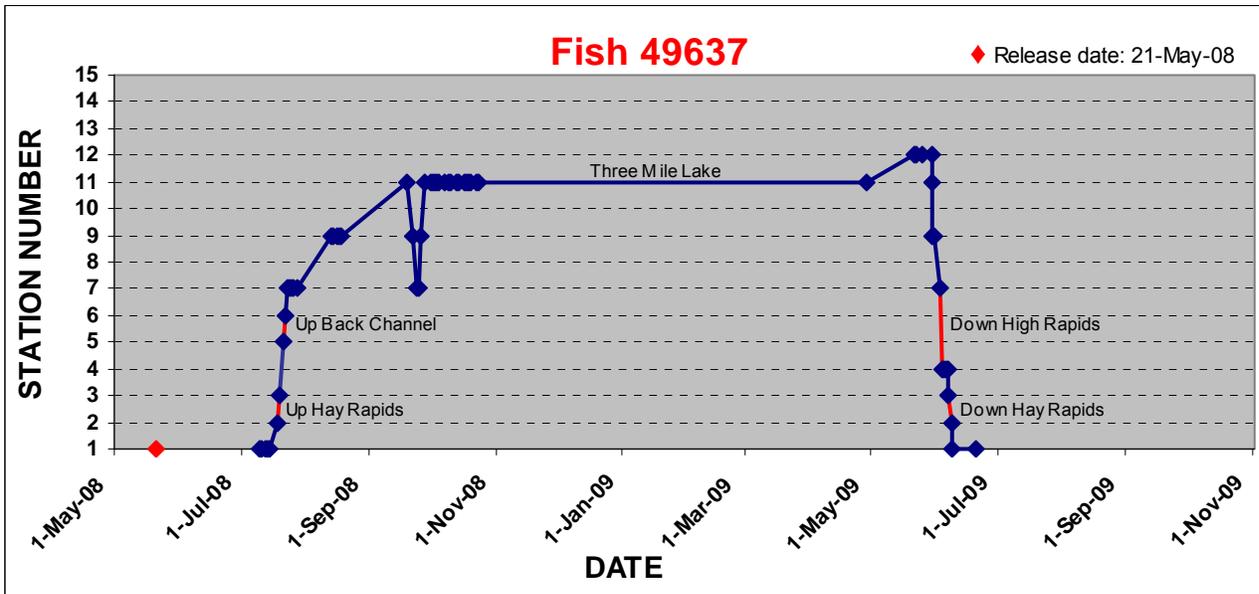
Appendix II: Movement of individual lake sturgeon released in 2008 within the Namakan River, Ontario.

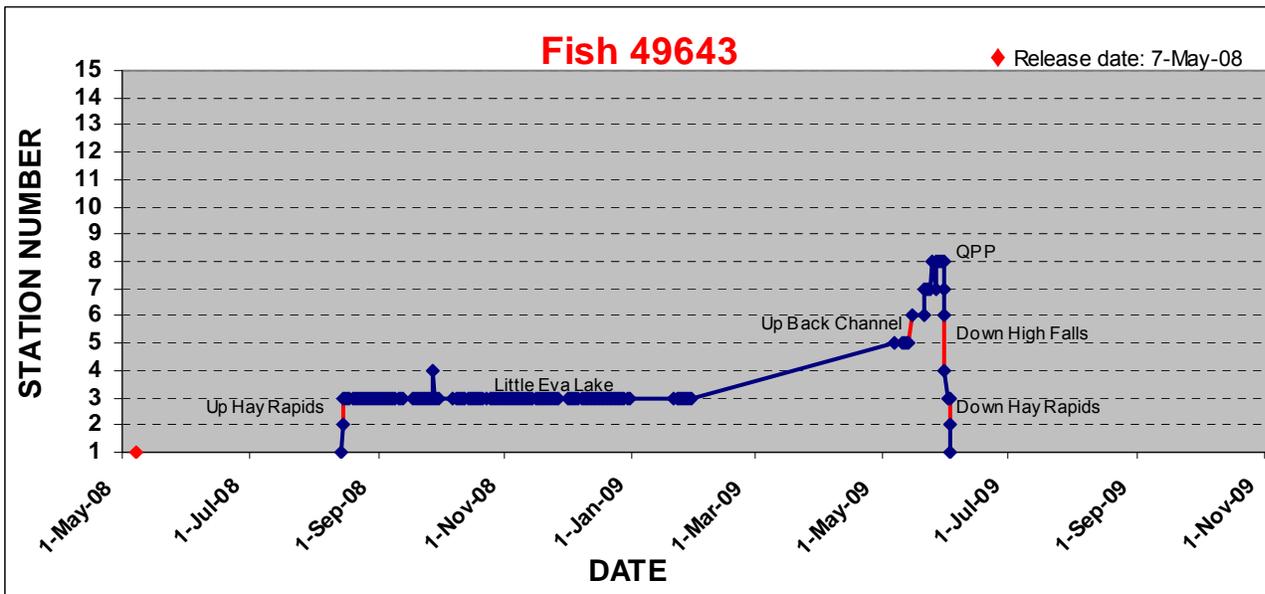
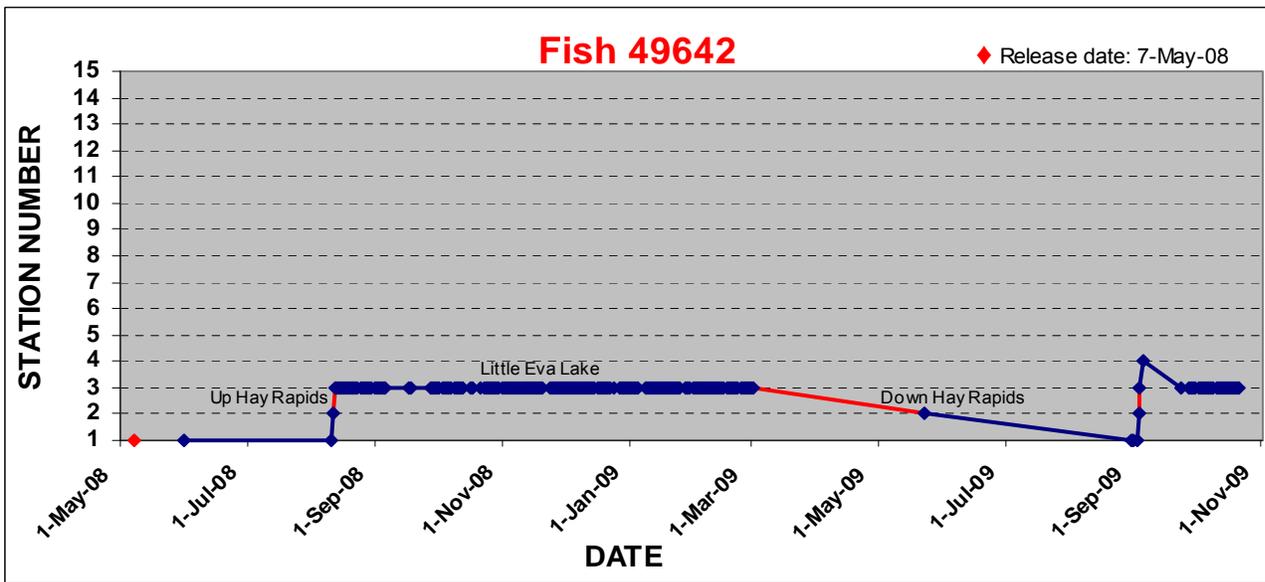
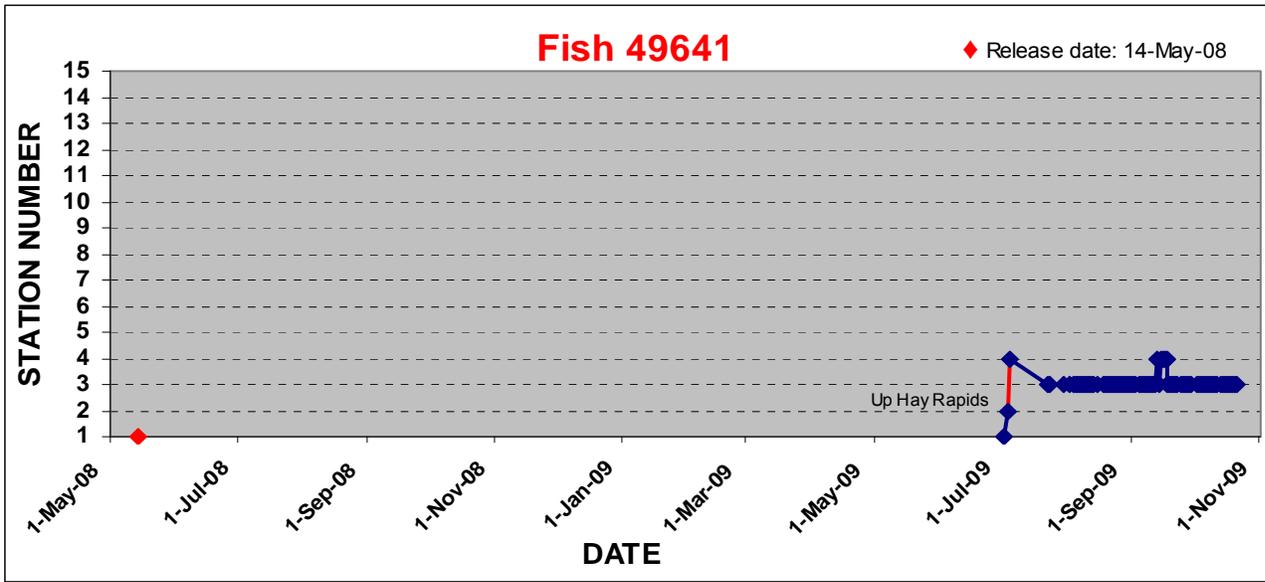
<u>Station #</u>	<u>Location Name</u>
15	Above Snake Falls
14	Below Snake Falls
13	Above Ivy Falls
12	Below Myrtle Falls
11	Below Ivy/Myrtle Falls (Three Mile Lake)
10	Bearpelt Creek
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7	Above Quetico Rapids
6	Above Back Channel (Bill Lake)
5	Lower Back Channel
4	Below High Falls
3	Above Hay Rapids (Little Eva Lake)
2	Below Hay Rapids
1	Below Lady Rapids (Namakan Lake)

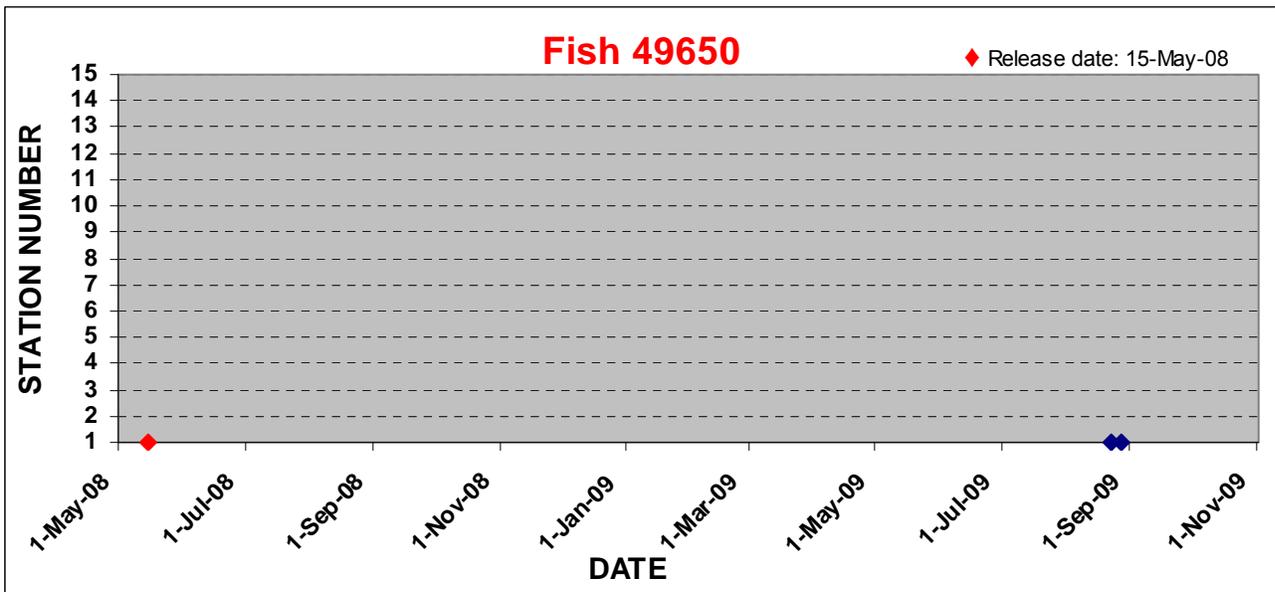
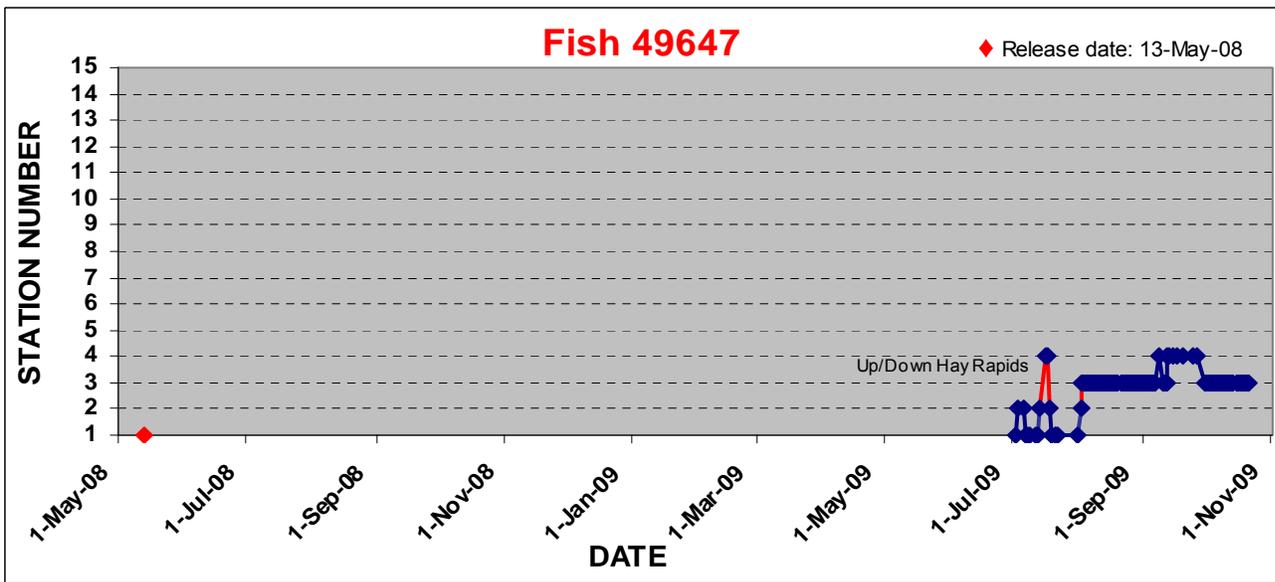
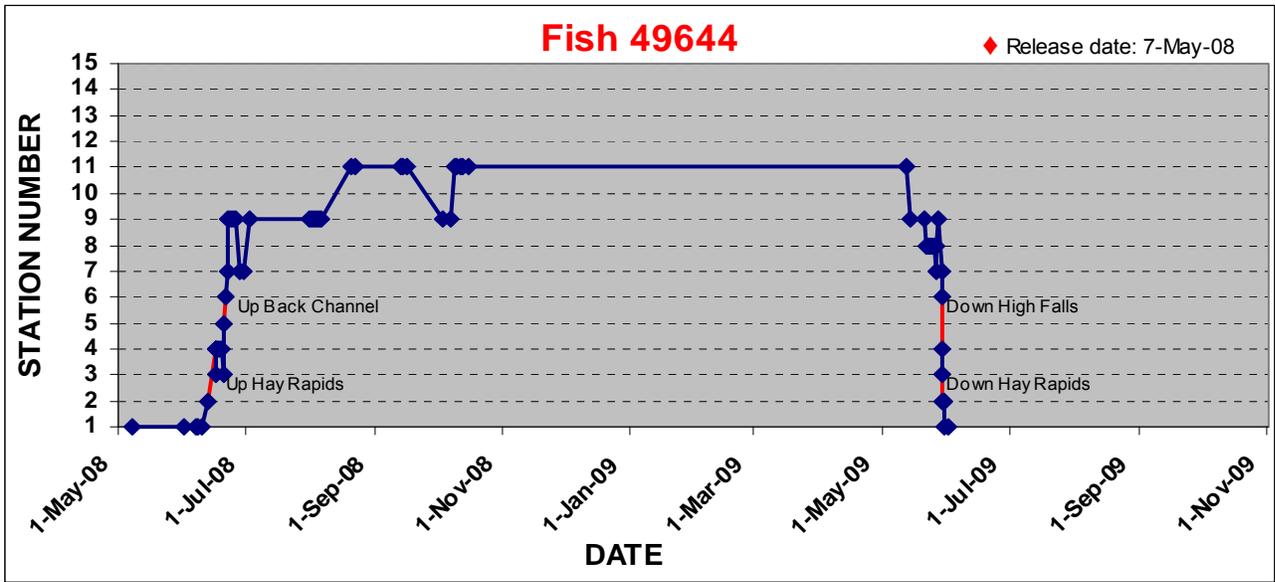


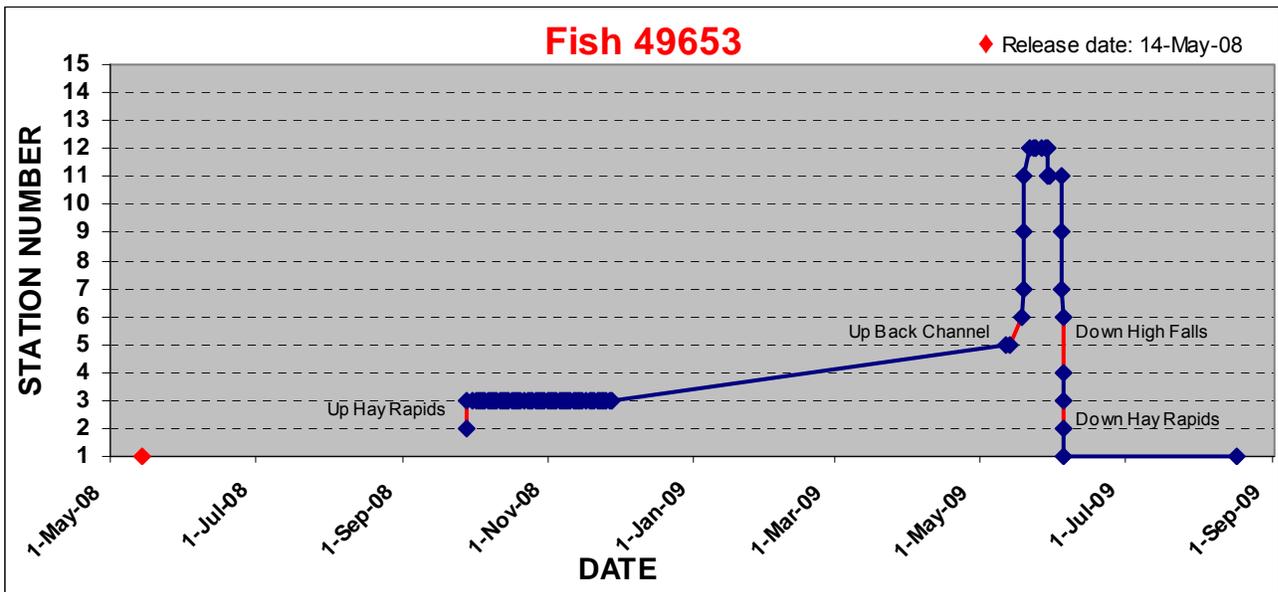
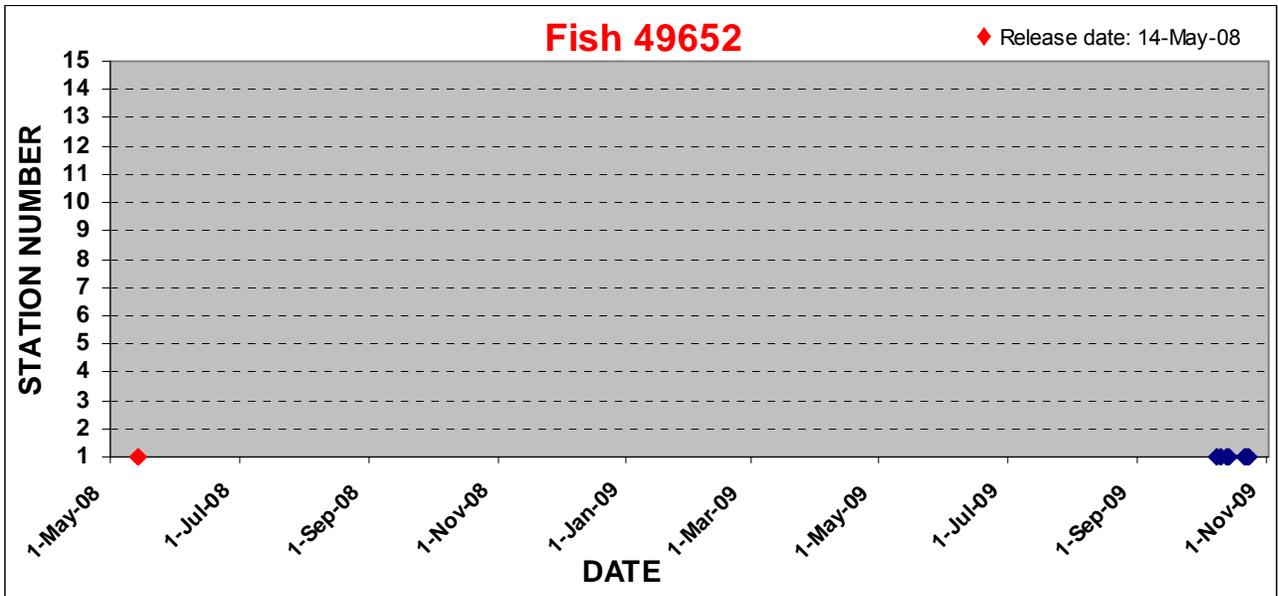












Appendix III: Movement of lake sturgeon through proposed hydro development sites (weir locations) on Namakan River, Ontario from 2007 to 2009. All flow values represent the main river flow based on reported outflow from Lac La Croix (05PA006). Estimated flows in the Back Channel are also provided based on flow distribution from Genivar, 2009 (Technical Note #2 Revision 3.0).

Location Description	Transmitter ID Code	Direction of Movement	Date/Time of Movement START	Date/Time of Movement END	Temperature (°C)	Water Flow (m ³ /s)	
Ivy/Myrtle Falls	4602	Downstream	Jun. 03, 2008 22:37	Jun. 04, 2008 22:07	12.6	409	
	4592	Downstream	Jun. 06, 2008 07:38	Jun. 07, 2008 16:39	12.5	403	
	4595	Downstream	Jun. 25, 2008 23:10	Jun. 28, 2008 00:46	18.2	384	
	4595	Downstream	Jul. 01, 2008 21:24	Jul. 02, 2008 12:53	19.2	358	
	4592	Downstream	Jul. 21, 2008 04:08	Jul. 21, 2008 13:37	20.4	238	
	4599	Downstream	Jul. 27, 2008 20:33	Jul. 28, 2008 18:42	21.7	197	
	8491	Downstream	Jul. 28, 2008 22:15	Oct. 21, 2008 02:21	19.5	109	
	4602	Upstream	May 21, 2008 23:56	May 29, 2008 18:40	7.4	464	
	4592	Upstream	Jun. 01, 2008 20:41	Jun. 02, 2008 19:50	12.2	431	
	4592	Upstream	Jun. 22, 2008 13:24	Jun. 22, 2008 21:50	16.5	403	
	4595	Upstream	Jun. 24, 2008 12:21	Jun. 24, 2008 21:30	17.4	396	
	4599	Upstream	Jun. 25, 2008 00:13	Jul. 03, 2008 00:38	18.2	391	
	4595	Upstream	Jun. 30, 2008 14:18	Jul. 01, 2008 13:07	18.8	373	
	8491	Upstream	May 05, 2009 23:22	Jun. 13, 2009 23:10	6.8	313	
	49640	Upstream	May 19, 2009 21:25	May 24, 2009 23:03	9.4	400	
Ivy Falls ¹	4589	Downstream	Jun. 14, 2009 20:28	Jun. 14, 2009 22:46	15.0	288	
	49640	Downstream	Jun. 15, 2009 19:57	Jun. 18, 2009 13:56	15.5	282	
		4589	Downstream	Jun. 16, 2009 02:07	Jun. 16, 2009 14:05	16.1	275
		4740	Downstream	Jun. 16, 2009 20:31	Jun. 17, 2009 07:24	16.1	275
		4592	Downstream	Jun. 21, 2009 18:24	Jun. 22, 2009 05:28	19.2	245
		8491	Downstream	Oct. 06, 2009 18:58	Oct. 12, 2009 06:19	12.5	54
Myrtle Falls ²	4740	Downstream	May 25, 2009 11:02	May 26, 2009 13:52	11.3	385	
	49640	Downstream	Jun. 12, 2009 23:49	Jun. 13, 2009 06:46	14.3	294	
		8492	Downstream	Sept. 27, 2009 23:14	Sept. 29, 2009 22:22	16.5	62
		8493	Downstream	Oct. 08, 2009 03:47	Oct. 08, 2009 23:04	11.4	51
Side Channel ³	4740	Upstream	May 22, 2009 02:58	May 23, 2009 15:57	10.6	394	
		4599	Upstream	Jun. 01, 2009 07:45	Jun. 19, 2009 17:03	11.5	361
		4589	Upstream	Jun. 06, 2009 05:32	Jun. 07, 2009 08:56	12.7	334
		4740	Upstream	Jun. 14, 2009 00:13	Jun. 14, 2009 18:45	15.0	288

	49640	Upstream	Jun. 14, 2009 02:19	Jun. 14, 2009 17:56	15.0	288
	4589	Upstream	Jun. 15, 2009 07:19	Jun. 15, 2009 19:42	15.5	282
	4592	Upstream	Jun. 18, 2009 04:24	Jun. 18, 2009 18:44	17.6	262
High Falls	4602	Downstream	Jun. 03, 2007 18:24	Jun. 04, 2007 14:31	16.9	64
	4594	Downstream	Jun. 10, 2007 02:19	Jun. 11, 2007 01:41	17.9	77
	4602	Downstream	Jun. 07, 2008 07:04	Jun. 07, 2008 08:03	13.0	403
	4741	Downstream	Jun. 13, 2008 04:24	Jun. 13, 2008 10:41	13.6	406
	49630	Downstream	Jul. 11, 2008 18:46	Jul. 12, 2008 11:05	19.9	287
	49633	Downstream	Jul. 17, 2008 04:52	Jul. 17, 2008 12:48	19.6	260
	49633	Downstream	Jul. 21, 2008 02:44	Jul. 22, 2008 05:51	20.4	238
	4741	Downstream	Oct. 15, 2008 05:15	Oct. 16, 2008 02:28	11.8	99
	49632	Downstream	Oct. 26, 2008 02:35	Oct. 26, 2008 23:37	8.9	111
	49632	Downstream	May 27, 2009 20:50	May 27, 2009 21:31	11.1	383
	49630	Downstream	May 28, 2009 00:43	May 28, 2009 01:24	11.4	378
	49635	Downstream	May 28, 2009 07:25	May 28, 2009 08:10	11.4	378
	49644	Downstream	May 29, 2009 06:12	May 29, 2009 10:45	11.9	375
	49643	Downstream	May 31, 2009 12:16	May 31, 2009 13:33	11.8	367
	49637	Downstream	Jun. 3, 2009 06:03	Jun. 4, 2009 10:55	12.5	350
	49653	Downstream	Jun. 4, 2009 20:09	Jun. 4, 2009 21:15	12.7	343
	4740	Downstream	Jun. 18, 2009 03:40	Jun. 18, 2009 07:42	17.6	262
	49640	Downstream	Jun. 19, 2009 04:13	Jun. 19, 2009 06:54	18.2	256
	4589	Downstream	Jul. 5, 2009 09:16	Jul. 5, 2009 22:37	18.2	183
	49634	Downstream	Jul. 7, 2009 00:32	Jul. 7, 2009 11:48	18.8	174
Back Channel	4593	Downstream	Oct. 15, 2007 22:48	Oct. 16, 2007 06:15	11.5	283 / 18
	4601	Downstream	May 23, 2008 21:05	May 24, 2008 17:01	8.5	467 / 31
	4592	Downstream	Jun. 19, 2008 01:41	Jun. 19, 2008 13:05	15.4	409 / 27
	4595	Downstream	May 28, 2009 19:59	May 29, 2009 14:51	11.4	375 / 24
	4592	Downstream	Jun. 23, 2009 18:32	Jun. 24, 2009 17:23	19.8	239 / 15
	4602	Upstream	Oct. 4, 2007 19:40	Return to Little Eva Lake	14.8	128 / 7
	4602	Upstream	Oct. 19, 2007 03:28	Oct. 19, 2007 20:27	11.1	320 / 21
	4592	Upstream	May 21, 2008 19:40	Return to Little Eva Lake	7.4	464 / 31
	4592	Upstream	May 23, 2008 00:35	May 25, 2008 03:34	8.5	467 / 31
	4741	Upstream	May 27, 2008 06:18	May 30, 2008 12:38	10.7	444 / 30
	4592	Upstream	Jun. 19, 2008 15:29	Jun. 20, 2008 00:41	15.4	407 / 27
	49644	Upstream	Jun. 20, 2008 17:16	Jun. 21, 2008 03:58	16.0	404 / 27

	49630	Upstream	Jun. 26, 2008 21:10	Jun. 27, 2008 21:55	18.9	383 / 25
	49634	Upstream	Jun. 28, 2008 23:50	Jun. 30, 2008 07:57	19.1	373 / 24
	49632	Upstream	Jul. 05, 2008 17:04	Jul. 06, 2008 13:44	19.9	321 / 23
	4741	Upstream	Jul. 07, 2008 00:30	Jul. 07, 2008 11:26	21.0	315 / 21
	49633	Upstream	Jul. 07, 2008 20:56	Jul. 08, 2008 14:52	21.0	302 / 19
	49633	Upstream	Jul. 19, 2008 23:20	Jul. 20, 2008 19:19	20.3	243 / 15
	49637	Upstream	Jul. 20, 2008 20:48	Jul. 22, 2008 15:59	20.2	232 / 14
	49632	Upstream	May 4, 2009 19:36	May 6, 2009 17:20	6.3	325 / 21
	49640	Upstream	May 4, 2009 22:39	May 8, 2009 10:22	6.3	346 / 22
	49643	Upstream	May 6, 2009 21:36	May 15, 2009 16:54	7.5	392 / 26
	49635	Upstream	May 9, 2009 12:44	May 22, 2009 08:32	7.9	394 / 26
	49653	Upstream	May 11, 2009 23:57	May 18, 2009 12:32	8.2	398 / 26
	4740	Upstream	May 13, 2009 00:28	May 13, 2009 13:26	9.0	383 / 25
	49630	Upstream	May 14, 2009 23:03	May 17, 2009 14:22	9.1	398 / 26
	4589	Upstream	May 25, 2009 01:54	May 29, 2009 16:49	11.9	375 / 26
	4601	Upstream	Jun. 5, 2009 19:54	Jun. 6, 2009 14:15	12.8	334 / 22
	4594	Upstream	Jun. 24, 2009 06:59	Return to Little Eva Lake	20.4	239 / 15
	4593	Upstream	Jul. 11, 2009 17:00	Jul. 12, 2009 04:19	19.8	149 / 9
	4594	Upstream	Jul. 12, 2009 20:43	Jul. 13, 2009 09:48	19.6	145 / 9
Hay Rapids	4588	Downstream	May 24, 2007 22:27	May 25, 2007 23:12	14.9	56
	4750	Downstream	May 25, 2007 02:23	May 25, 2007 23:47	14.9	56
	4589	Downstream	May 25, 2007 03:02	May 27, 2007 02:13	14.1	58
	4749	Downstream	May 28, 2007 01:32	May 28, 2007 05:38	14.0	59
	4602	Downstream	Jun. 07, 2007 11:36	Jun. 08, 2007 05:51	17.7	71
	4591	Downstream	Jun. 07, 2007 12:53	Jun. 08, 2007 03:03	17.7	71
	4594	Downstream	Jun. 12, 2007 08:31	Jun. 12, 2007 17:53	19.1	83
	4590	Downstream	Jun. 18, 2007 05:53	Jun. 19, 2007 22:46	21.1	99
	4742	Downstream	Jul. 11, 2007 11:45	Jul. 12, 2007 00:24	21.4	106
	4752	Downstream	Sept. 19, 2007 04:40	Sept. 20, 2007 23:57	14.7	42
	4751	Downstream	Sept. 30, 2007 19:24	Oct. 1, 2007 22:54	15.2	106
	4744	Downstream	Oct. 15, 2007 22:11	Oct. 16, 2007 13:41	11.2	283
	4593	Downstream	Oct. 17, 2007 00:49	Oct. 17, 2007 08:18	11.0	293
	4601	Downstream	May 24, 2008 20:57	May 25, 2008 13:28	10.2	464
	4602	Downstream	Jun. 08, 2008 06:06	Jun. 08, 2008 09:33	13.4	402
	4741	Downstream	Jun. 16, 2008 10:32	Jun. 17, 2008 01:32	14.4	411
	4742	Downstream	Aug. 17, 2008 02:05	Aug. 17, 2008 22:03	22.7	115

4741	Downstream	Feb. 26, 2009 23:21	May 05, 2009 14:53	6.8	313
49642	Downstream	Mar. 01, 2009 00:35	May 23, 2009 04:18	10.7	391
4744	Downstream	Mar. 01, 2009 02:49	May 07, 2009 13:39	8.3	336
49633	Downstream	May 27, 2009 10:31	May 28, 2009 23:40	11.4	378
49630	Downstream	May 28, 2009 02:11	May 28, 2009 15:10 ⁴	11.4	378
8495	Downstream	May 28, 2009 02:54	May 28, 2009 12:21 ⁴	11.4	378
49635	Downstream	May 28, 2009 08:27	May 29, 2009 11:54 ⁴	11.9	375
49632	Downstream	May 28, 2009 18:32	May 28, 2009 23:57 ⁴	11.4	378
49644	Downstream	May 29, 2009 13:53	May 29, 2009 18:52	11.9	375
4595	Downstream	May 29, 2009 21:26	May 30, 2009 01:19	12.1	369
49643	Downstream	Jun. 02, 2009 02:13	Jun. 02, 2009 05:04	11.9	355
49653	Downstream	Jun. 05, 2009 04:03	Jun. 05, 2009 06:08	12.8	338
4588	Downstream	Jun. 05, 2009 22:52	Jun. 06, 2009 22:10	12.7	334
4750	Downstream	Jun. 06, 2009 02:28	Jun. 06, 2009 06:06	12.7	334
49637	Downstream	Jun. 07, 2009 16:41	Jun. 08, 2009 23:08	12.9	324
4739	Downstream	Jun. 14, 2009 22:22	Jun. 15, 2009 02:28	15.5	282
4591	Downstream	Jun. 16, 2009 12:40	Jun. 17, 2009 05:22	17.0	268
4740	Downstream	Jun. 18, 2009 07:58	Jun. 19, 2009 09:00 ⁴	18.2	256
49640	Downstream	Jun. 18, 2009 18:00	Jun. 19, 2009 13:59 ⁴	18.2	256
4592	Downstream	Jun. 24, 2009 17:23	Jun. 27, 2009 03:16 ⁴	20.8	223
4594	Downstream	Jul. 01, 2009 14:33	Jul. 06, 2009 13:30 ⁴	18.6	178
4589	Downstream	Jul. 06, 2009 01:38	Jul. 06, 2009 15:58 ⁴	18.6	178
49634	Downstream	Jul. 07, 2009 17:48	Jul. 08, 2009 02:10 ⁴	19.0	169
49647	Downstream	Jul. 17, 2009 02:51	Jul. 18, 2009 11:13 ⁴	17.4	130
4742	Downstream	Aug. 02, 2009 23:49	Aug. 03, 2009 04:33	19.0	108
4590	Downstream	Oct. 05, 2009 17:55	Oct. 06, 2009 20:50	12.5	54
4742	Upstream	Jun. 12, 2007 03:12	Jun. 12, 2007 14:52	19.1	83
4744	Upstream	Jul. 19, 2007 09:37	Jul. 19, 2007 17:59	21.8	94
4741	Upstream	Jul. 26, 2007 22:10	Jul. 27, 2007 10:02	24.9	80
4602	Upstream	Sept. 29, 2007 23:22	Sept. 30, 2007 06:56	15.4	99
49644	Upstream	Jun. 11, 2008 23:09	Jun. 16, 2008 10:49	14.3	411
49634	Upstream	Jun. 23, 2008 16:00	Jun. 25, 2008 23:41	18.2	391
49630	Upstream	Jun. 24, 2008 15:45	Jun. 26, 2008 09:52	18.9	386
49633	Upstream	Jun. 25, 2008 23:21	Jun. 27, 2008 16:12	19.2	383
4741	Upstream	Jun. 26, 2008 05:08	Jun. 27, 2008 00:45	19.2	383
49632	Upstream	Jul. 02, 2008 19:27	Jul. 03, 2008 23:10	19.3	350
49635	Upstream	Jul. 17, 2008 05:35	Jul. 17, 2008 11:57	19.6	260

49637	Upstream	Jul. 18, 2008	18:21	Jul. 19, 2008	03:14	20.3	249
4742	Upstream	Jul. 21, 2008	00:43	Jul. 21, 2008	15:22	20.4	238
4744	Upstream	Jul. 29, 2008	20:41	Jul. 30, 2008	08:53	21.9	185
4740	Upstream	Aug. 02, 2008	09:45	Aug. 02, 2008	17:35	22.0	173
4588	Upstream	Aug. 03, 2008	21:37	Aug. 04, 2008	19:42	22.4	163
49640	Upstream	Aug. 04, 2008	05:57	Aug. 04, 2008	11:40	22.4	163
49642	Upstream	Aug. 10, 2008	20:22	Aug. 12, 2008	07:45	22.4	132
49643	Upstream	Aug. 15, 2008	03:02	Aug. 15, 2008	11:15	22.3	122
4739	Upstream	Sept. 6, 2008	22:44	Sept. 7, 2008	22:43	19.6	70
49653	Upstream	Sept. 27, 2008	02:14	Sept. 27, 2008	06:36	16.5	67
4741	Upstream	May 07, 2009	03:31	Aug. 02, 2009	21:16	19.0	109
8495	Upstream	May 21, 2009	15:39	May 26, 2009	16:37 ⁴	11.3	385
4589	Upstream	May 22, 2009	13:12	May 25, 2009	16:49 ⁴	11.5	386
4591	Upstream	May 23, 2009	00:03	May 25, 2009	16:07 ⁴	11.5	386
4750	Upstream	May 25, 2009	16:35	May 25, 2009	21:43 ⁴	11.5	386
4601	Upstream	Jun. 01, 2009	02:38	Jun. 01, 2009	19:06	11.5	361
4752	Upstream	Jun. 07, 2009	17:02	Jun. 09, 2009	23:06	12.8	319
4594	Upstream	Jun. 15, 2009	00:26	Jun. 22, 2009	09:44 ⁴	19.2	248
4745	Upstream	Jun. 24, 2009	00:10	Jun. 30, 2009	03:04 ⁴	17.9	208
49641	Upstream	Jul. 03, 2009	22:28	Jul. 05, 2009	03:42 ⁴	18.2	183
4742	Upstream	Jul. 03, 2009	22:55	Jul. 23, 2009	22:11	19.2	119
4593	Upstream	Jul. 10, 2009	23:23	Jul. 11, 2009	17:00 ⁴	19.8	153
4594	Upstream	Jul. 11, 2009	23:05	Jul. 12, 2009	20:43 ⁴	19.6	149
49647	Upstream	Jul. 14, 2009	08:19	Jul. 16, 2009	18:56 ⁴	18.2	134
4744	Upstream	Jul. 24, 2009	07:22	Jul. 24, 2009	21:14	19.5	118
49647	Upstream	Aug. 01, 2009	21:32	Aug. 02, 2009	03:12	19.0	109
4592	Upstream	Aug. 16, 2009	13:59	Aug. 16, 2009	22:36	22.4	101
49642	Upstream	Sept. 02, 2009	22:14	Sept. 03, 2009	02:04	19.7	90
49631	Upstream	Sept. 04, 2009	00:22	Sept. 05, 2009	00:15	20	88
4746	Upstream	Sept. 05, 2009	08:17	Sept. 06, 2009	16:45	20.4	86
4590	Upstream	Sept. 10, 2009	02:25	Sept. 11, 2009	02:12	21.4	80
4739	Upstream	Sept. 16, 2009	23:24	Sept. 17, 2009	14:15	21.3	73

¹ receiver deployed above Ivy Falls on May 14, 2009

² receiver deployed below Myrtle Falls on May 20, 2009

³ movements occurring after May 20, 2009 which bypassed both Ivy Falls and Myrtle Falls receivers

⁴ receiver above Hay Rapids (Little Eva Lake) was inoperable from March 1-May 28, 2009 and June 17-July 21, 2009.

Appendix IV: Movement of lake sturgeon through other flowing (undeveloped) rapids on Namakan River, Ontario from 2007 to 2009. All flow values represent the main river flow based on reported outflow from Lac La Croix (05PA006).

Location Description	Transmitter ID Code	Direction of Movement	Date/Time of Movement START	Date/Time of Movement END	Temperature (°C)	Water Flow (m ³ /s)
Twisted Rapids	4600	Downstream	Jun. 02, 2007 04:29	Jun. 03, 2007 09:51	16.9	64
	4602	Downstream	Jun. 02, 2007 20:25	Jun. 03, 2007 17:09	16.9	64
	4594	Downstream	Jun. 09, 2007 04:13	Jun. 09, 2007 16:48	17.6	74
	4593	Downstream	Jun. 11, 2007 21:42	Jun. 12, 2007 05:50	19.1	83
	4593	Downstream	Jun. 18, 2007 07:22	Jun. 18, 2007 14:11	21.9	99
	4593	Downstream	Jul. 04, 2007 00:44	Jul. 10, 2007 07:27	22.6	108
	4593	Downstream	Jul. 23, 2007 23:54	Jul. 24, 2007 10:57	23.5	84
	4593	Downstream	Oct. 1, 2007 03:04	Oct. 3, 2007 23:13	14.9	121
	4597	Downstream	May 28, 2008 10:44	May 29, 2008 13:07	11.4	446
	4602	Downstream	Jun. 06, 2008 16:30	Jun. 06, 2008 22:38	12.5	407
	4741	Downstream	Jun. 10, 2008 12:47	Jun. 11, 2008 13:41	13.4	407
	4592	Downstream	Jun. 13, 2008 06:39	Jun. 14, 2008 05:19	14.1	407
	4595	Downstream	Jun. 28, 2008 02:24	Jun. 28, 2008 07:34	19.1	384
	4595	Downstream	Jul. 07, 2008 08:12	Jul. 07, 2008 23:10	21.0	315
	49633	Downstream	Jul. 10, 2008 00:38	Jul. 12, 2008 04:16	19.7	283
	4741	Downstream	Jul. 10, 2008 18:03	Jul. 11, 2008 17:11	19.9	287
	49632	Downstream	Jul. 12, 2008 03:06	Jul. 13, 2008 14:43	18.9	278
	4741	Downstream	Jul. 24, 2008 15:17	Jul. 25, 2008 06:27	21.7	213
	4595	Downstream	Jul. 29, 2008 17:39	Sept. 28, 2008 01:00	16.3	69
	49632	Downstream	Aug. 04, 2008 03:47	Aug. 04, 2008 11:32	22.4	163
	49632	Downstream	Aug. 23, 2008 08:09	Aug. 23, 2008 13:07	22.1	96
	49634	Downstream	Sept. 14, 2008 06:21	Sept. 17, 2008 22:34	16.9	65
	49644	Downstream	Sept. 15, 2008 02:41	Oct. 3, 2008 00:43	14.3	76
	49632	Downstream	Sept. 16, 2008 04:14	Sept. 16, 2008 15:47	16.8	65
	49637	Downstream	Sept. 19, 2008 00:59	Sept. 21, 2008 16:46	16.9	61
	49634	Downstream	Sept. 29, 2008 18:57	Oct. 1, 2008 19:15	15.0	73
	49632	Downstream	Oct. 02, 2008 23:09	Oct. 3, 2008 18:28	14.3	76
	49634	Downstream	Oct. 06, 2008 01:26	Oct. 9, 2008 07:02	12.9	83
	4592	Downstream	Oct. 08, 2008 10:29	May 15, 2009 21:30	8.5	392
	49632	Downstream	Oct. 09, 2008 22:46	Oct. 10, 2008 06:45	12.3	87
	49632	Downstream	Oct. 13, 2008 19:03	Oct. 14, 2008 21:33	12.1	98

49634	Downstream	Oct. 20, 2008	03:53	Oct. 21, 2008	05:49	10.1	109
49632	Downstream	Oct. 23, 2008	16:26	Oct. 24, 2008	00:03	9.3	111
4595	Downstream	Nov. 04, 2008	12:23	May 05, 2009	19:49	6.8	313
49644	Downstream	May 12, 2009	07:28	May 13, 2009	20:28	9.0	383
49630	Downstream	May 27, 2009	17:16	May 27, 2009	18:35	11.1	383
49635	Downstream	May 27, 2009	22:43	May 28, 2009	01:23	11.4	378
49634	Downstream	May 28, 2009	10:12	May 29, 2009	00:10	11.9	375
49637	Downstream	May 30, 3009	04:03	May 30, 2009	09:26	12.1	369
49653	Downstream	Jun. 04, 2009	10:57	Jun. 04, 2009	14:30	12.7	343
4740	Downstream	Jun. 17, 2009	14:20	Jun. 17, 2009	19:16	17.0	268
49640	Downstream	Jun. 18, 2009	15:17	Jun. 18, 2009	21:35	17.6	262
4589	Downstream	Jun. 22, 2009	03:27	Jun. 23, 2009	16:44	19.8	245
4592	Downstream	Jun. 22, 2009	16:46	Jun. 23, 2009	02:04	19.8	245
49634	Downstream	Jul. 02, 2009	11:36	Jul. 06, 2009	05:05	18.6	178
4593	Upstream	May 23, 2007	21:21	May 25, 2007	22:17	14.7	55
4595	Upstream	May 26, 2007	14:13	May 27, 2007	19:08	14.6	58
4594	Upstream	May 27, 2007	07:44	May 27, 2007	22:40	14.1	58
4593	Upstream	Jun. 17, 2007	22:46	Jun. 18, 2007	03:47	22.2	97
4593	Upstream	Jun. 19, 2007	12:37	Jun. 19, 2007	18:39	21.1	99
4593	Upstream	Jul. 13, 2007	08:00	Jul. 13, 2007	21:38	20.7	105
4593	Upstream	Sept. 27, 2007	00:09	Sept. 27, 2007	07:58	15.4	78
4597	Upstream	Oct. 06, 2007	20:34	Nov. 15, 2007	21:29	14.0	147
4602	Upstream	Oct. 20, 2007	10:20	-	-	11.0	335
4592	Upstream	May 30, 2008	21:05	May 31, 2008	05:35	11.7	444
4741	Upstream	May 31, 2008	14:12	May 31, 2008	18:26	12.0	439
4592	Upstream	Jun. 22, 2008	08:01	Jun. 22, 2008	12:54	16.5	403
4595	Upstream	Jun. 29, 2008	12:50	Jun. 29, 2008	17:05	19.1	380
49634	Upstream	Jul. 02, 2008	04:21	Jul. 06, 2008	04:50	19.5	358
4741	Upstream	Jul. 08, 2008	02:51	Jul. 08, 2008	06:04	20.6	302
49632	Upstream	Jul. 08, 2008	15:44	Jul. 09, 2008	01:22	20.6	302
49633	Upstream	Jul. 09, 2008	01:59	Jul. 09, 2008	08:46	20.2	295
4741	Upstream	Jul. 18, 2008	19:18	Jul. 19, 2008	05:23	20.1	253
4595	Upstream	Jul. 27, 2008	21:42	Jul. 28, 2008	14:05	21.7	202
49632	Upstream	Aug. 02, 2008	12:20	Aug. 03, 2008	16:01	22.0	173
49644	Upstream	Aug. 05, 2008	22:01	Aug. 19, 2008	20:29	22.6	158
49637	Upstream	Aug. 17, 2008	21:26	Aug. 18, 2008	22:27	22.7	115
49632	Upstream	Aug. 21, 2008	22:17	Aug. 22, 2008	12:51	22.9	104

	49632	Upstream	Sept. 12, 2008 01:55	Sept. 12, 2008 23:17	17.7	69
	49637	Upstream	Sept. 24, 2008 22:11	Sept. 27, 2008 11:30	17.1	61
	49634	Upstream	Sept. 26, 2008 00:08	Sept. 26, 2008 10:33	16.7	63
	4595	Upstream	Sept. 29, 2008 10:30	Oct. 11, 2008 01:19	16.0	70
	49632	Upstream	Sept. 30, 2008 12:45	Oct. 2, 2008 00:53	15.5	72
	49634	Upstream	Oct. 03, 2008 19:43	Oct. 4, 2008 03:17	14.3	76
	49632	Upstream	Oct. 05, 2008 23:06	Oct. 8, 2008 02:20	13.7	79
	49644	Upstream	Oct. 06, 2008 05:01	Oct. 8, 2008 05:09	13.4	81
	49632	Upstream	Oct. 10, 2008 21:04	Oct. 12, 2008 09:02	12.3	87
	49634	Upstream	Oct. 14, 2008 05:40	Oct. 14, 2008 14:11	12.1	98
	49632	Upstream	Oct. 21, 2008 21:01	Oct. 23, 2008 11:16	10.1	109
	49634	Upstream	Oct. 22, 2008 19:57	Apr. 18, 2009 15:43	9.6	109
	4740	Upstream	May 14, 2009 08:24	May 14, 2009 16:05	9.1	386
	49640	Upstream	May 17, 2009 22:24	May 18, 2009 05:47	8.6	398
	49653	Upstream	May 19, 2009 05:54	May 19, 2009 15:04	9.4	400
	49630	Upstream	May 22, 2009 13:48	May 22, 2009 21:21	10.6	394
	49635	Upstream	May 23, 2009 18:34	May 23, 2009 21:26	10.7	391
	4592	Upstream	May 27, 2009 19:58	May 28, 2009 00:34	11.1	383
	4589	Upstream	May 31, 2009 00:21	May 31, 2009 05:29	11.8	367
	49634	Upstream	Jul. 01, 2009 03:23	Jul. 02, 2009 11:04	16.8	204
	4601	Upstream	Jul. 01, 2009 13:28	Jul. 07, 2009 02:00	16.8	204
	4594	Upstream	Jul. 13, 2009 19:06	Jul. 14, 2009 05:40	19.7	145
Quetico River	4592	Downstream	May 30, 2008 21:05	May 31, 2008 05:35	11.7	444
	49644	Downstream	May 23, 2009 16:00	May 24, 2009 03:26	10.7	391
	49643	Downstream	May 25, 2009 12:31	May 27, 2009 13:32	11.5	386
	49644	Downstream	May 26, 2009 04:30	May 27, 2009 14:46	11.3	385
	49644	Downstream	May 27, 2009 17:05	May 27, 2009 20:13	11.1	383
	4600	Downstream	May 28, 2009 13:49	Jun. 24, 2009 08:24	11.4	378
	49643	Downstream	May 30, 2009 20:20	May 30, 2009 22:21	12.1	369
	4589	Downstream	May 30, 2009 20:56	May 31, 2009 00:18	12.1	369
	4592	Upstream	May 25, 2008 23:18	May 26, 2008 02:22	10.9	463
	49644	Upstream	May 21, 2009 04:55	May 21, 2009 20:42	10.2	395
	49644	Upstream	May 24, 2009 06:07	May 24, 2009 11:51	11.2	388
	49643	Upstream	May 24, 2009 18:32	May 24, 2009 20:47	11.2	388
	49644	Upstream	May 27, 2009 14:56	May 27, 2009 16:56	11.1	383
	49643	Upstream	May 27, 2009 15:35	May 27, 2009 18:31	11.1	383
	4600	Upstream	May 27, 2009 18:50	May 27, 2009 21:53	11.1	383

	4589	Upstream	May 29, 2009 20:43	May 29, 2009 23:16	11.9	375
Bearpelt Creek	4741	Downstream	Jun. 01, 2008 16:26	Jun. 02, 2008 11:37	12.2	431
	4741	Downstream	Jun. 04, 2008 10:30	Jun. 04, 2008 16:34	12.6	409
	4602	Downstream	Jun. 06, 2008 16:30	Jun. 06, 2008 22:38	12.5	407
	4741	Upstream	Jun. 01, 2008 09:14	Jun. 01, 2008 11:30	12.2	431
	4741	Upstream	Jun. 02, 2008 16:38	Jun. 03, 2008 12:23	12.6	417
	4602	Upstream	Jun. 04, 2008 22:16	Jun. 05, 2008 21:46	12.6	404
Quetico Rapids	4602	Downstream	Jun. 03, 2007 18:24	Jun. 04, 2007 14:31	16.9	64
	4600	Downstream	Jun. 04, 2007 00:34	Jun. 06, 2007 22:52	17.6	64
	4594	Downstream	Jun. 10, 2007 02:19	Jun. 10, 2007 13:41	17.9	77
	4593	Downstream	Jun. 12, 2007 06:42	Jun. 15, 2007 05:11	19.1	83
	4600	Downstream	Jun. 13, 2007 00:16	Jul. 09, 2007 13:14	19.9	85
	4593	Downstream	Jul. 24, 2007 11:25	Jul. 28, 2007 03:31	23.5	84
	4593	Downstream	Sept. 08, 2007 05:56	Sept. 11, 2007 04:38	19.6	36
	4593	Downstream	Oct. 05, 2007 03:37	Oct. 5, 2007 06:52	14.5	138
	4593	Downstream	Oct. 10, 2007 01:09	Oct. 11, 2007 16:09	12.7	205
	4601	Downstream	May 22, 2008 12:39	May 23, 2008 21:01	7.9	467
	4597	Downstream	Jun. 03, 2008 16:16	Jun. 04, 2008 00:33	12.6	417
	4602	Downstream	Jun. 07, 2008 04:52	Jun. 07, 2008 06:38	13.0	403
	4741	Downstream	Jun. 13, 2008 01:57	Jun. 13, 2008 04:06	13.6	406
	4592	Downstream	Jun. 14, 2008 12:13	Jun. 14, 2008 15:57	14.1	407
	4595	Downstream	Jul. 09, 2008 19:01	Jul. 10, 2008 04:55	20.2	295
	49630	Downstream	Jul. 11, 2008 18:46	Jul. 11, 2008 23:05	19.9	287
	49633	Downstream	Jul. 17, 2008 04:52	Jul. 17, 2008 05:48	19.6	260
	49632	Downstream	Jul. 20, 2008 12:55	Jul. 20, 2008 19:16	20.2	243
	4741	Downstream	Jul. 27, 2008 13:11	Jul. 27, 2008 19:32	21.7	202
	4741	Downstream	Aug. 05, 2008 13:18	Aug. 05, 2008 18:53	22.6	158
	49634	Downstream	Oct. 12, 2008 00:55	Oct. 13, 2008 00:02	12.3	94
	49632	Downstream	Oct. 16, 2008 22:27	Oct. 18, 2008 22:28	11.5	102
	49632	Downstream	Oct. 26, 2008 02:35	Oct. 26, 2008 23:37	8.9	111
	4595	Downstream	May 06, 2009 21:48	May 07, 2009 03:40	7.5	325
	49632	Downstream	May 26, 2009 23:37	May 27, 2009 03:53	11.3	385
	49630	Downstream	May 27, 2009 22:32	May 28, 2009 00:43	11.1	383
	49635	Downstream	May 28, 2009 05:35	May 28, 2009 07:25	11.4	378
	49644	Downstream	May 28, 2009 23:34	May 29, 2009 06:09	11.4	378
	49643	Downstream	May 30, 2009 22:35	May 31, 2009 12:15	12.1	369
	49637	Downstream	Jun. 03, 2009 06:03	Jun. 04, 2009 10:55	12.5	350

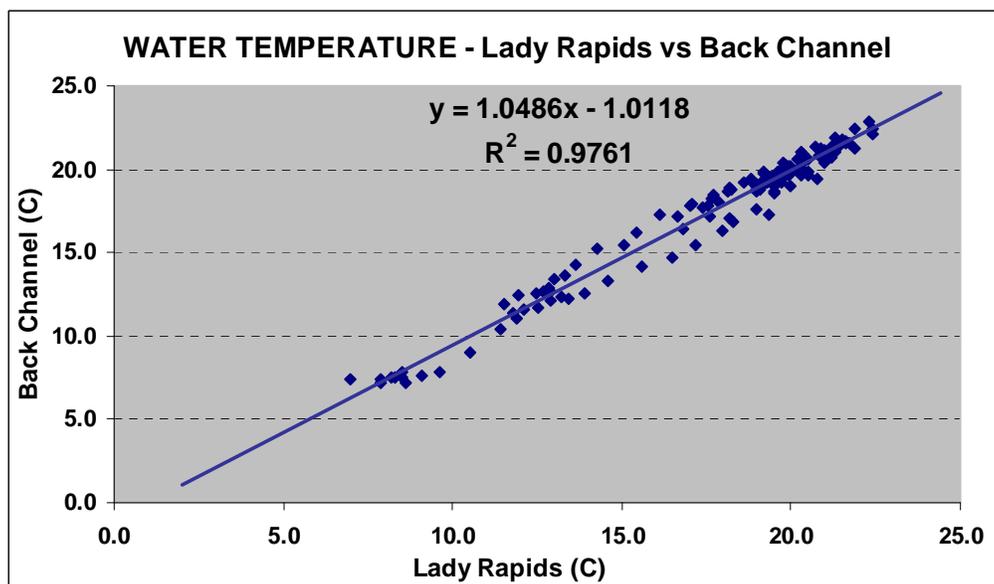
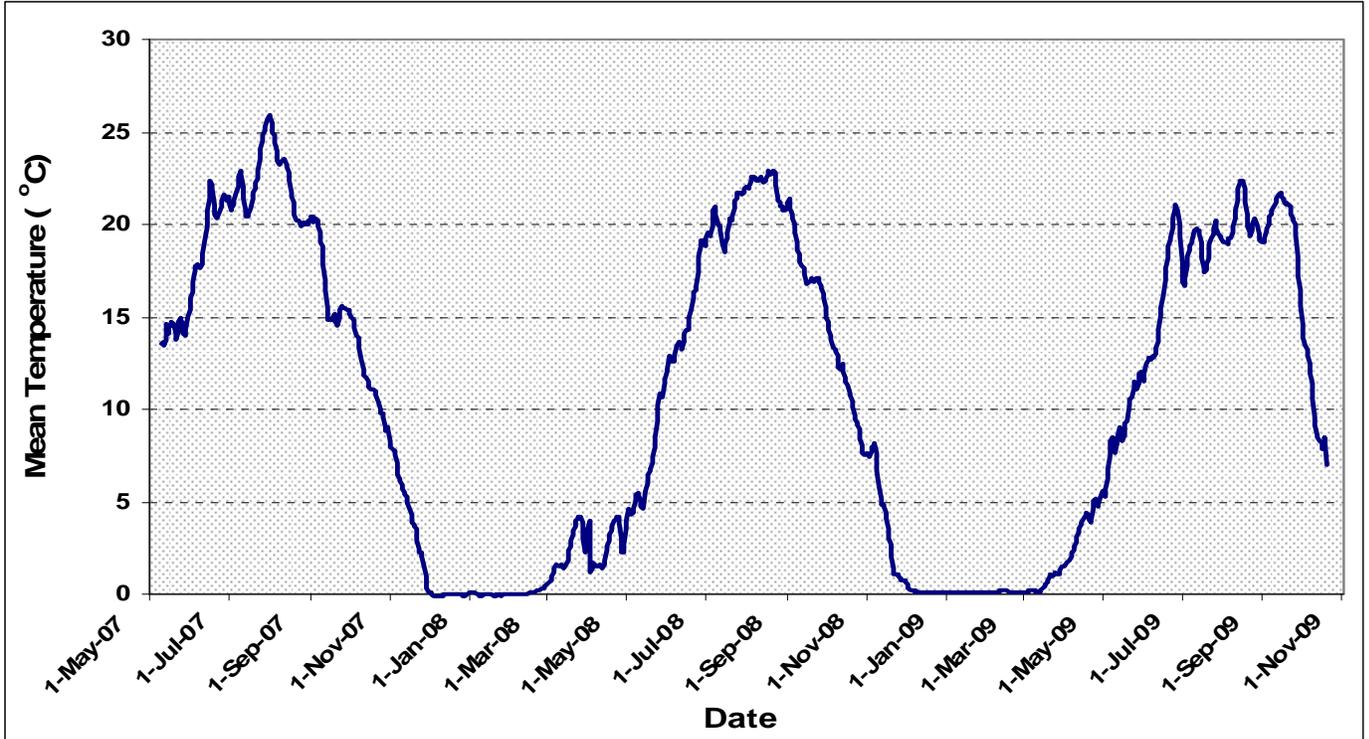
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4592	Downstream	Jun. 23, 2009	12:18	Jun. 23, 2009	16:31	19.8	245
4589	Downstream	Jun. 23, 2009	23:40	Jun. 25, 2009	02:20	19.8	245
4600	Downstream	Jun. 24, 2009	17:21	Aug. 09, 2009	06:33	20.4	239
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4589	Downstream	Jul. 05, 2009	09:16	Jul. 05, 2009	22:37	18.2	183
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4600	Downstream	Aug. 15, 2009	19:11	Oct. 06, 2009	10:35	22.4	102
4593	Upstream	May 23, 2007	14:00	May 23, 2007	18:36	14.7	55
4600	Upstream	Jun. 09, 2007	06:01	Jun. 12, 2007	21:58	19.1	83
4593	Upstream	Jun. 17, 2007	16:00	Jun. 17, 2007	21:19	22.2	97
4593	Upstream	Sept. 25, 2007	05:43	Sept. 25, 2007	19:18	15.6	65
4593	Upstream	-		Sept. 4, 2007	21:33	20.1	33
4597	Upstream	Oct. 04, 2007	01:01	Oct. 06, 2007	03:29	14.0	147
4593	Upstream	Oct. 07, 2007	23:07	Oct. 09, 2007	20:27	13.3	186
4602	Upstream	Oct. 20, 2007	00:18	Oct. 20, 2007	03:35	11.0	335
4592	Upstream	May 25, 2008	08:15	May 25, 2008	22:50	10.2	464
4741	Upstream	May 30, 2008	15:21	May 31, 2008	07:33	12.0	439
49644	Upstream	Jun. 21, 2008	05:27	Jun. 21, 2008	19:46	16.4	404
4592	Upstream	Jun. 21, 2008	09:04	Jun. 22, 2008	01:58	16.5	403
49634	Upstream	Jun. 30, 2008	09:01	Jun. 30, 2008	21:35	18.8	373
49630	Upstream	Jul. 06, 2008	03:57	Jul. 06, 2008	11:01	20.7	321
49632	Upstream	Jul. 06, 2008	14:45	Jul. 07, 2008	21:58	21.0	315
4741	Upstream	Jul. 07, 2008	15:45	Jul. 07, 2008	18:41	21.0	315
49633	Upstream	Jul. 08, 2008	16:23	Jul. 08, 2008	20:47	20.6	302
4595	Upstream	Jul. 11, 2008	12:19	Jul. 24, 2008	09:44	21.4	220
49632	Upstream	Jul. 20, 2008	20:30	Jul. 27, 2008	19:56	21.7	202
49637	Upstream	Jul. 22, 2008	16:34	Jul. 23, 2008	08:24	21.3	226
4741	Upstream	Jul. 30, 2008	12:41	Aug. 05, 2008	02:47	22.6	158
49634	Upstream	Oct. 13, 2008	06:56	Oct. 13, 2008	23:42	12.5	96
49632	Upstream	Oct. 19, 2008	07:04	Oct. 20, 2008	07:00	10.5	107
4600	Upstream	May 05, 2009	06:17	May 19, 2009	14:38	9.4	400
49632	Upstream	May 06, 2009	18:16	May 07, 2009	09:00	8.3	336
49640	Upstream	May 13, 2009	09:38	May 13, 2009	21:20	9.0	383
4740	Upstream	May 13, 2009	13:54	May 13, 2009	17:18	9.0	383

	49653	Upstream	May 18, 2009 13:28	May 18, 2009 21:06	9.2	398
	49630	Upstream	May 20, 2009 21:18	May 21, 2009 19:45	10.2	395
	49643	Upstream	May 21, 2009 01:15	May 21, 2009 05:38	10.2	395
	49635	Upstream	May 22, 2009 09:06	May 22, 2009 13:45	10.6	394
	4589	Upstream	May 29, 2009 17:37	May 29, 2009 20:15	11.9	375
	4601	Upstream	Jun. 06, 2009 15:35	Jun. 07, 2009 03:59	12.8	328
	4589	Upstream	Jul. 01, 2009 10:14	Jul. 01, 2009 21:28	16.8	204
	4589	Upstream	Jul. 03, 2009 00:45	Jul. 03, 2009 03:42	17.1	194
	4594	Upstream	Jul. 13, 2009 10:56	Jul. 13, 2009 13:44	19.7	145
	4600	Upstream	Aug. 10, 2009 08:59	Aug. 15, 2009 06:33	22.4	102
Lady Rapids	4745	Downstream	May 16, 2007 14:29	-	14.5	52
	4739	Downstream	May 16, 2007 15:46	-	14.5	52
	4740	Downstream	May 16, 2007 21:52	May 22, 2007 18:34	14.5	52
	4747	Downstream	May 18, 2007 21:17	-	14.7	53
	4744	Downstream	May 19, 2007 20:19	Jul. 16, 2007 13:45	14.6	54
	4748	Downstream	May 22, 2007 01:46	May 22, 2007 20:51	14.2	55
	4741	Downstream	May 24, 2007 14:49	May 30, 2007 03:55	15.0	56
	4588	Downstream	May 25, 2007 23:50	May 26, 2007 05:36	14.9	56
	4750	Downstream	May 26, 2007 00:12	May 26, 2007 03:29	14.6	58
	4589	Downstream	May 27, 2007 02:51	May 28, 2007 00:25	14.1	58
	4749	Downstream	May 28, 2007 06:57	May 28, 2007 21:00	14.0	59
	4743	Downstream	May 28, 2007 23:40	May 29, 2007 16:22	14.0	59
	4591	Downstream	Jun. 08, 2007 03:46	Jun. 08, 2007 11:48	17.7	71
	4602	Downstream	Jun. 08, 2007 06:48	June 8, 2007 21:35	17.7	71
	4594	Downstream	Jun. 12, 2007 18:05	Jun. 13, 2007 07:04	19.1	83
	4590	Downstream	Jun. 20, 2007 02:24	Jun. 21, 2007 06:55	20.5	103
	4748	Downstream	Jun. 24, 2007 23:17	Jun. 26, 2007 00:56	21.0	113
	4742	Downstream	Jul. 12, 2007 01:05	Jul. 12, 2007 10:06	21.4	106
	4752	Downstream	Sept. 21, 2007 00:16	Sept. 21, 2007 10:11	14.7	44
	4602	Downstream	Sept. 26, 2007 20:07	Sept. 27, 2007 05:16	15.4	72
	4751	Downstream	Oct. 01, 2007 23:48	Oct. 2, 2007 21:00	15.2	106
	4744	Downstream	Oct. 16, 2007 14:45	Oct. 16, 2007 23:19	11.2	283
	4593	Downstream	Oct. 17, 2007 13:51	Oct. 18, 2007 03:46	11.0	293
	4601	Downstream	May 25, 2008 13:45	May 31, 2008 13:00	10.2	464
	4602	Downstream	Jun. 08, 2008 09:38	Jun. 08, 2008 21:27	13.4	402
	4742	Downstream	Aug. 17, 2008 22:39	Aug. 18, 2008 06:00	22.7	115
	4744	Downstream	May 07, 2009 20:19	Jul. 22, 2009 22:00	8.3	336

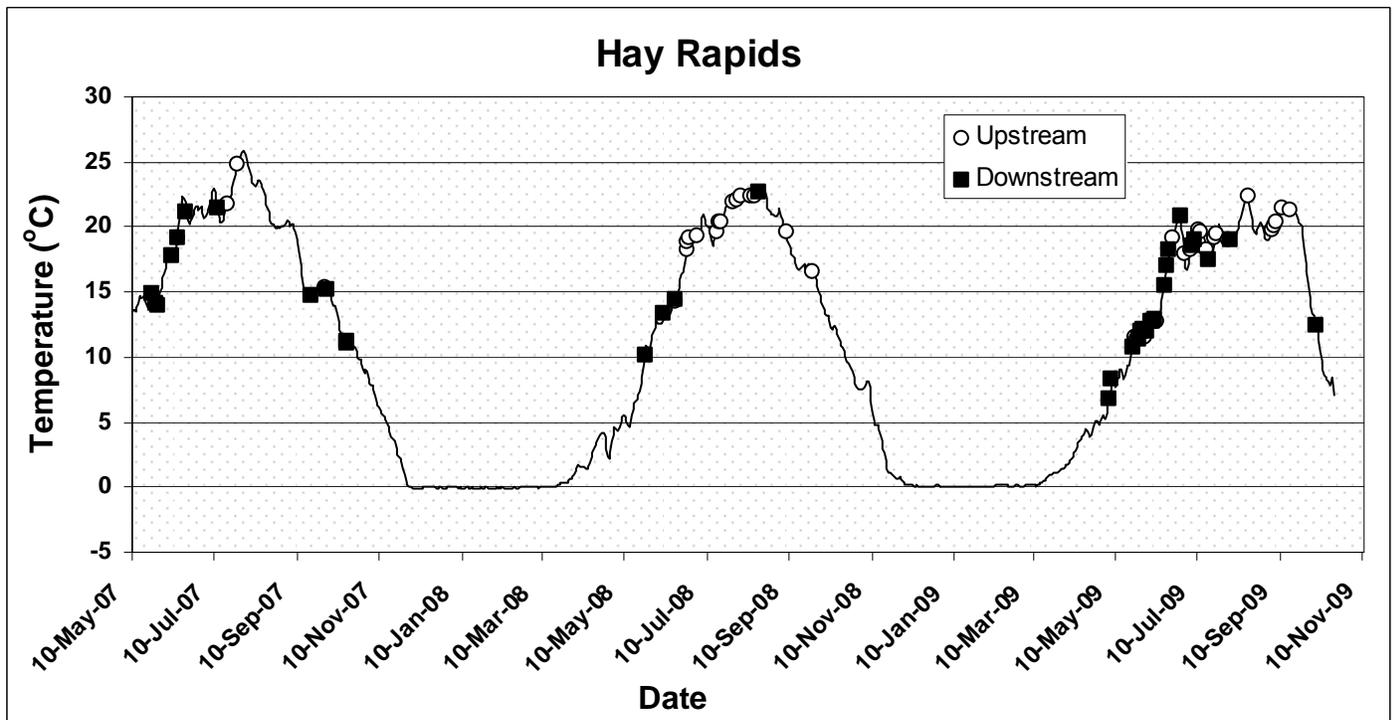
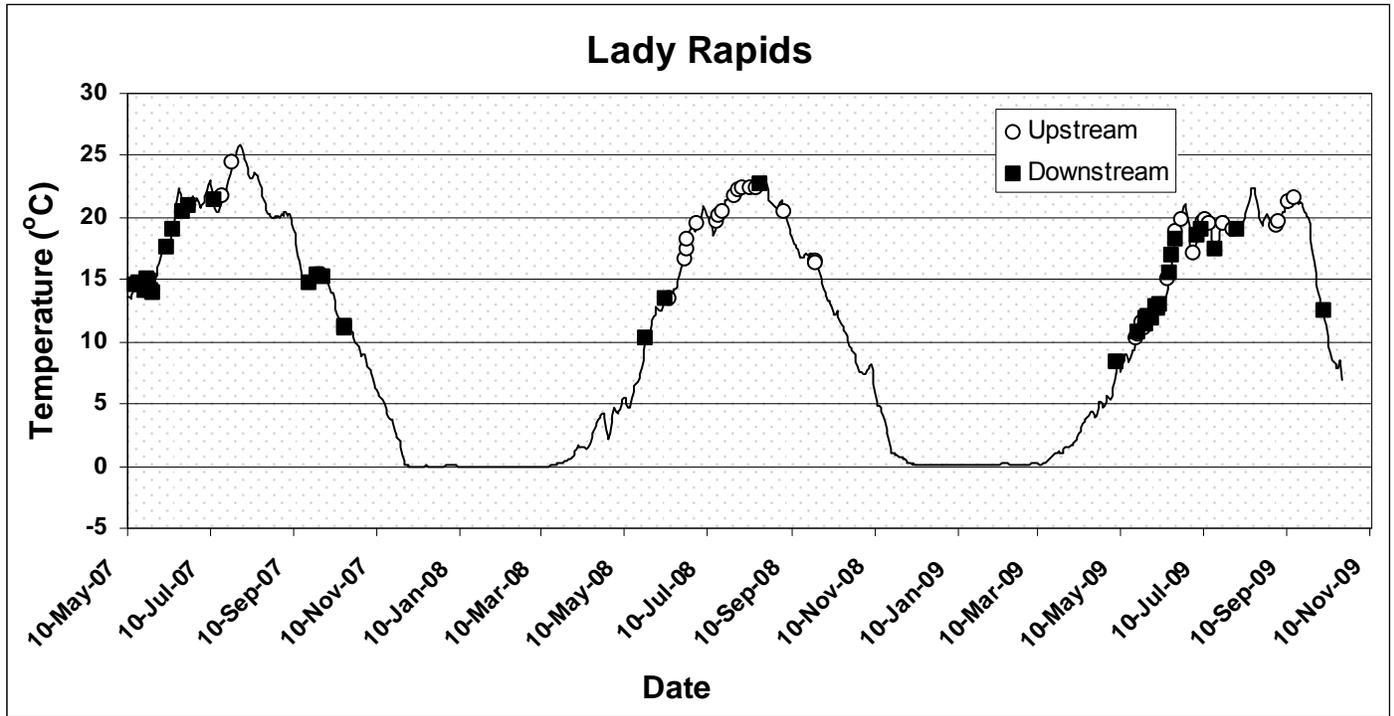
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4748	Downstream	May 28, 2009 11:10	Jun. 05, 2009 06:01	11.4	378
8495	Downstream	May 28, 2009 12:46	May 28, 2009 19:58	11.4	378
49630	Downstream	May 28, 2009 15:19	May 28, 2009 19:11	11.4	378
49632	Downstream	May 29, 2009 00:42	May 29, 2009 05:01	11.9	375
49633	Downstream	May 29, 2009 02:46	May 29, 2009 10:54	11.9	375
49635	Downstream	May 29, 2009 12:25	May 29, 2009 16:30	11.9	375
49644	Downstream	May 29, 2009 19:07	May 30, 2009 04:14	11.9	375
4595	Downstream	May 30, 2009 08:53	May 31, 2009 03:17	12.1	369
49643	Downstream	Jun. 02, 2009 05:58	Jun. 02, 2009 09:32	11.9	355
49653	Downstream	Jun. 05, 2009 06:41	Jun. 05, 2009 09:40	12.8	338
4750	Downstream	Jun. 06, 2009 06:44	Jun. 06, 2009 10:59	12.7	334
4588	Downstream	Jun. 06, 2009 23:22	Jun. 07, 2009 10:59	12.7	334
49637	Downstream	Jun. 08, 2009 23:33	Jun. 09, 2009 06:21	12.9	324
4739	Downstream	Jun. 15, 2009 02:43	Jun. 15, 2009 14:19	15.5	282
4591	Downstream	Jun. 17, 2009 05:41	Jun. 17, 2009 12:46	17.0	268
4740	Downstream	Jun. 19, 2009 09:23	Jun. 19, 2009 21:22	18.2	256
49640	Downstream	Jun. 19, 2009 14:09	Jun. 19, 2009 17:13	18.2	256
4594	Downstream	Jul. 06, 2009 14:09	Jul. 07, 2009 10:26	18.6	178
4589	Downstream	Jul. 06, 2009 16:05	Jul. 06, 2009 20:30	18.6	178
49647	Downstream	Jul. 06, 2009 16:34	Jul. 07, 2009 00:18	18.6	178
49634	Downstream	Jul. 08, 2009 02:20	Jul. 08, 2009 07:53	19.0	169
49647	Downstream	Jul. 18, 2009 12:04	Jul. 19, 2009 08:37	17.4	130
4742	Downstream	Aug. 03, 2009 05:19	Aug. 03, 2009 21:19	19.0	108
4590	Downstream	Oct. 06, 2009 21:17	Oct. 10, 2009 05:42	12.5	54
4748	Upstream	Jun. 23, 2007 13:13	Jun. 24, 2007 17:12	21.0	113
4744	Upstream	Jul. 16, 2007 22:16	Jul. 19, 2007 09:09	21.8	94
4741	Upstream	Jul. 25, 2007 08:58	Jul. 26, 2007 20:43	24.5	81
4602	Upstream	Sept. 25, 2007 15:26	Sept. 26, 2007 03:30	15.4	72
4602	Upstream	Sept. 29, 2007 12:29	Sept. 29, 2007 22:58	15.4	92
4601	Upstream	May 31, 2008 14:29	May 31, 2009 23:37	11.8	367
49644	Upstream	Jun. 09, 2008 02:56	Jun. 11, 2008 21:37	13.4	407
49634	Upstream	Jun. 14, 2008 20:19	Jun. 23, 2008 15:35	16.7	400
49630	Upstream	Jun. 22, 2008 00:39	Jun. 24, 2008 15:06	17.4	396
49633	Upstream	Jun. 24, 2008 00:28	Jun. 25, 2008 23:01	18.2	391
49632	Upstream	Jun. 28, 2008 11:54	Jul. 02, 2008 18:45	19.5	358
49637	Upstream	Jul. 14, 2008 00:38	Jul. 18, 2008 18:01	20.1	253

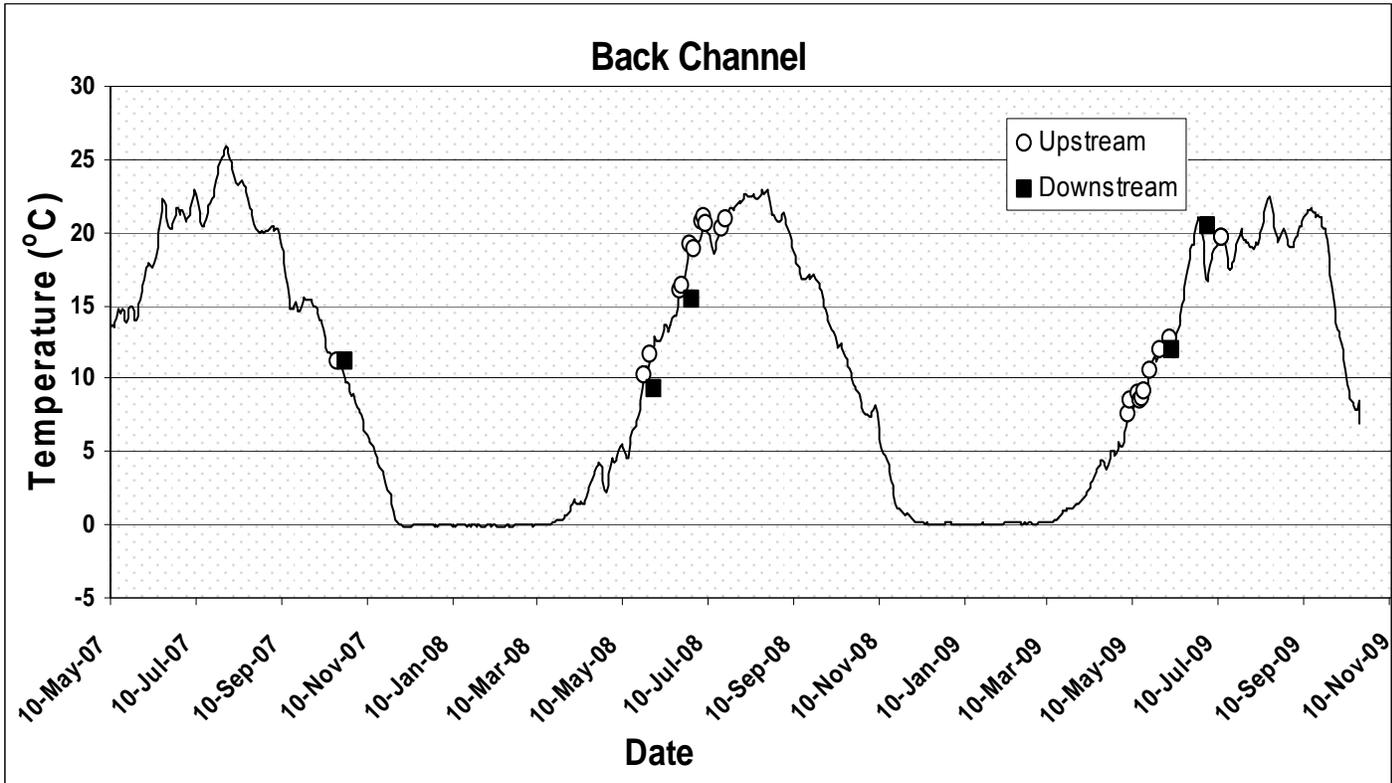
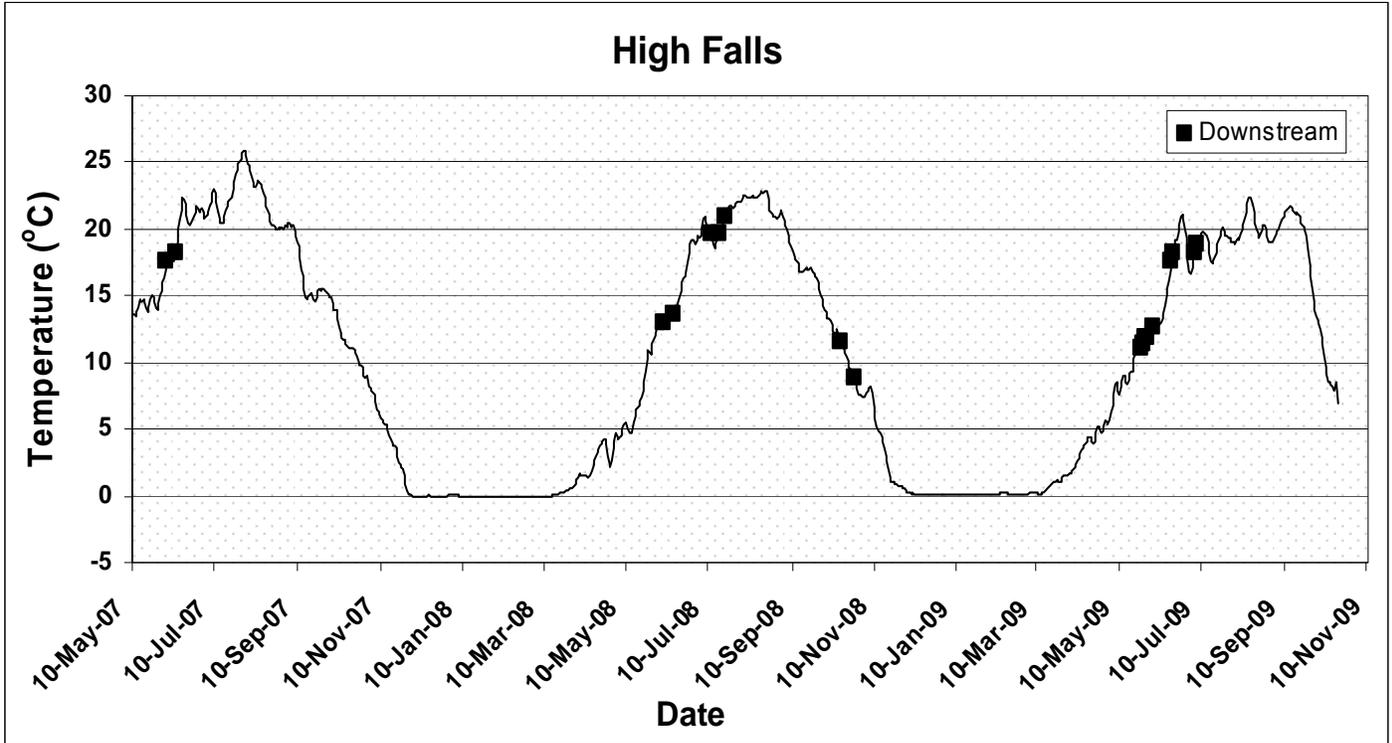
49635	Upstream	Jul. 14, 2008	10:55	Jul. 17, 2008	04:57	19.6	260
4742	Upstream	Jul. 17, 2008	03:02	Jul. 21, 2008	00:07	20.4	238
4589	Upstream	Jul. 20, 2008	16:49	May 22, 2009	12:36	10.6	394
4744	Upstream	Jul. 28, 2008	11:07	Jul. 29, 2008	19:54	21.7	191
49640	Upstream	Jul. 29, 2008	00:42	Aug. 04, 2008	05:34	22.4	163
4588	Upstream	Aug. 01, 2008	02:39	Aug. 02, 2008	23:57	22.0	173
4740	Upstream	Aug. 01, 2008	03:40	Aug. 02, 2008	09:19	22.0	173
4591	Upstream	Aug. 06, 2008	21:15	May 22, 2009	23:36	10.6	394
49642	Upstream	Aug. 09, 2008	23:37	Aug. 10, 2008	20:00	22.4	139
49643	Upstream	Aug. 14, 2008	11:30	Aug. 15, 2008	02:38	22.3	122
4750	Upstream	Aug. 23, 2008	05:49	May 25, 2009	21:43	11.5	386
4748	Upstream	Aug. 27, 2008	05:37	May 27, 2009	23:59	11.1	383
8495	Upstream	Sept. 05, 2008	11:34	May 21, 2009	15:12	10.2	395
4739	Upstream	Sept. 3, 2008	17:13	Sept. 4, 2008	19:39	20.5	74
4752	Upstream	-	-	Sept. 28, 2008	19:59	16.3	69
49653	Upstream	-	-	Sept. 27, 2008	01:41	16.5	67
4742	Upstream	Jun. 12, 2009	10:24	Jun. 20, 2009	07:27	18.8	249
4594	Upstream	Jun. 12, 2009	17:07	Jun. 14, 2009	23:11	15.0	288
4745	Upstream	Jun. 20, 2009	15:22	Jun. 23, 2009	23:49	19.8	245
49647	Upstream	Jul. 02, 2009	06:39	Jul. 03, 2009	11:41	17.1	194
49641	Upstream	Jul. 02, 2009	17:21	Jul. 03, 2009	22:06	17.1	194
4593	Upstream	Jul. 10, 2009	09:13	Jul. 10, 2009	23:09	19.7	158
4594	Upstream	Jul. 10, 2009	20:15	Jul. 11, 2009	22:44	19.8	153
49647	Upstream	Jul. 13, 2009	11:47	Jul. 14, 2009	05:22	19.5	143
4744	Upstream	Jul. 23, 2009	03:46	Jul. 24, 2009	06:58	19.5	118
49647	Upstream	Jul. 31, 2009	20:51	Aug. 01, 2009	19:43	19.0	108
49642	Upstream	Sept. 02, 2009	04:44	Sept. 02, 2009	19:20	19.3	91
49631	Upstream	Sept. 03, 2009	03:44	Sept. 03, 2009	23:32	19.7	90
4590	Upstream	Sept. 09, 2009	15:04	Sept. 10, 2009	02:08	21.2	81
4739	Upstream	Sept. 14, 2009	22:04	Sept. 15, 2009	18:33	21.5	77

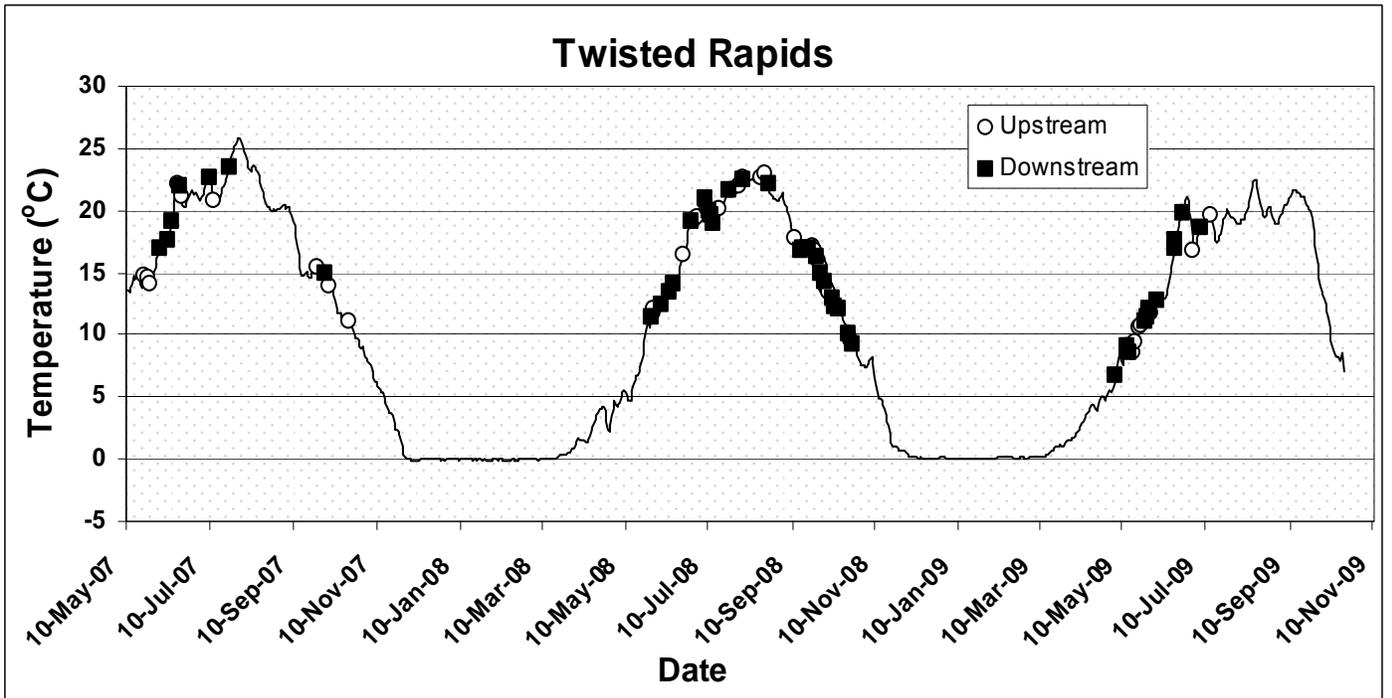
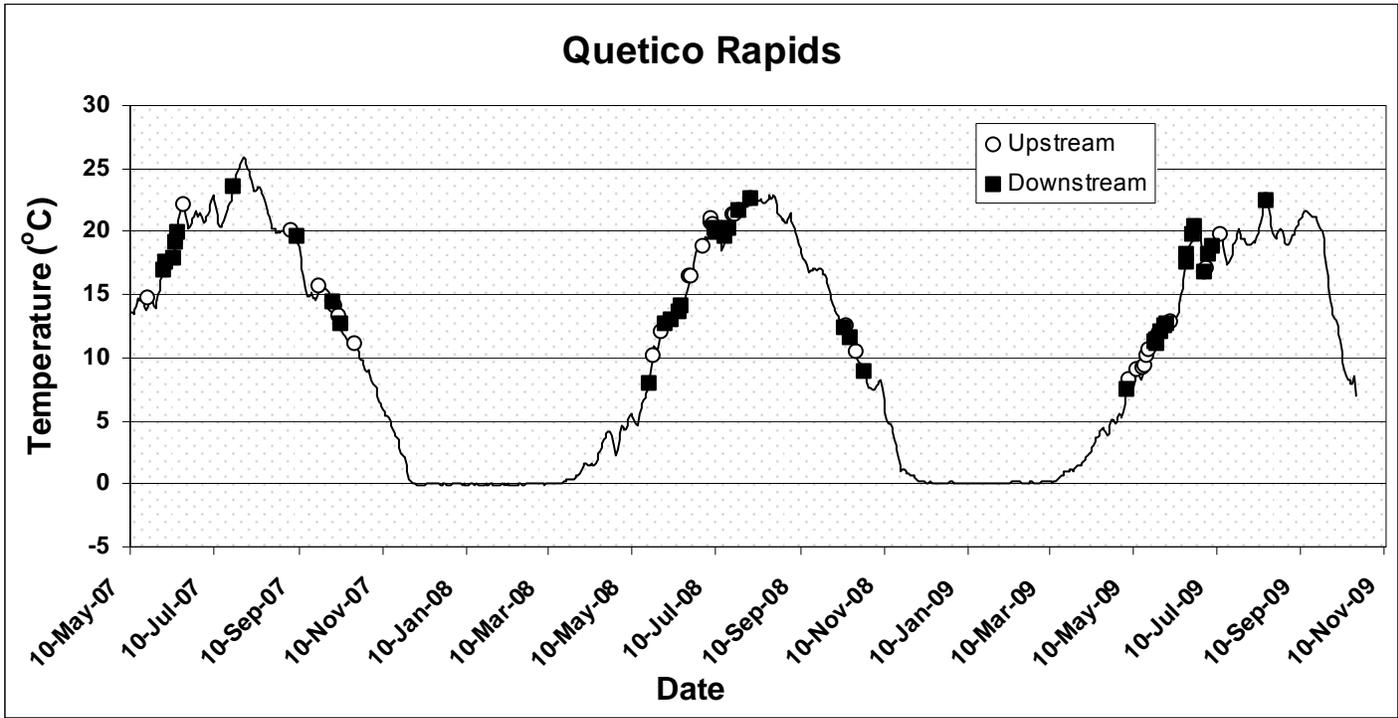
Appendix V: Mean daily water temperature recorded at Lady Rapids in Namakan River, Ontario from May, 2007 to October, 2009. Insert includes regression analysis comparing surface water temperatures in the Back Channel to the main river at Lady Rapids from May 30 to October 19, 2009.



Appendix VI: Movement of lake sturgeon through selected shallow rapids/falls in relation to daily water temperatures in the Namakan River, Ontario.



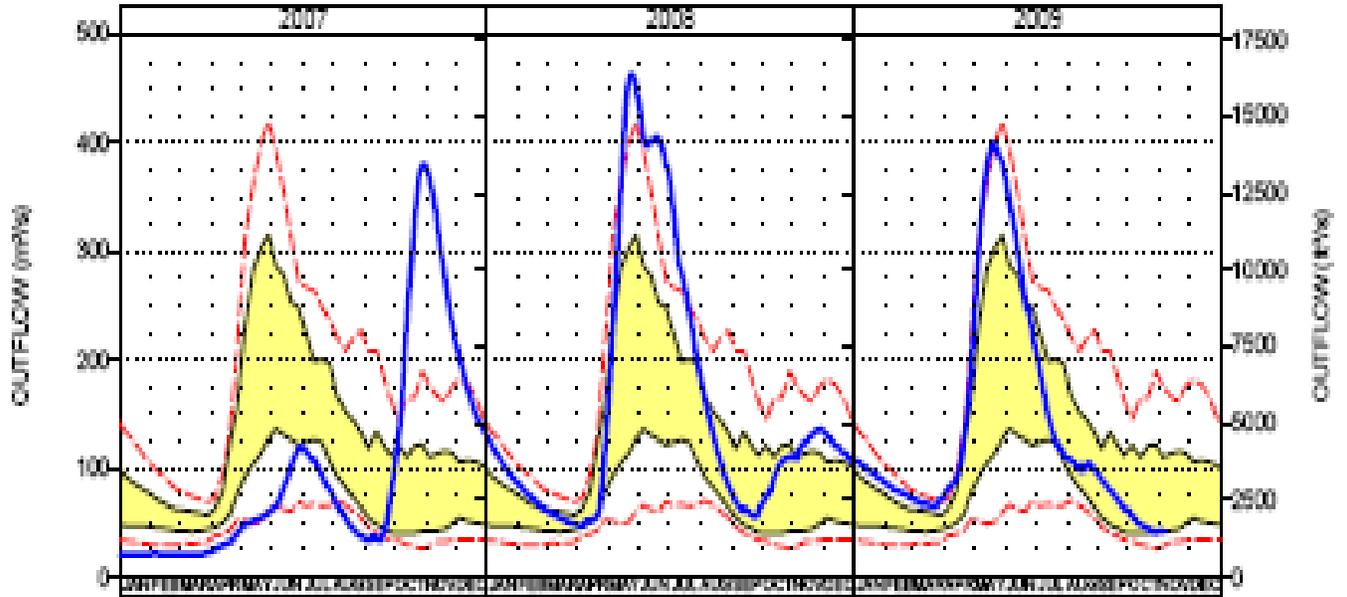




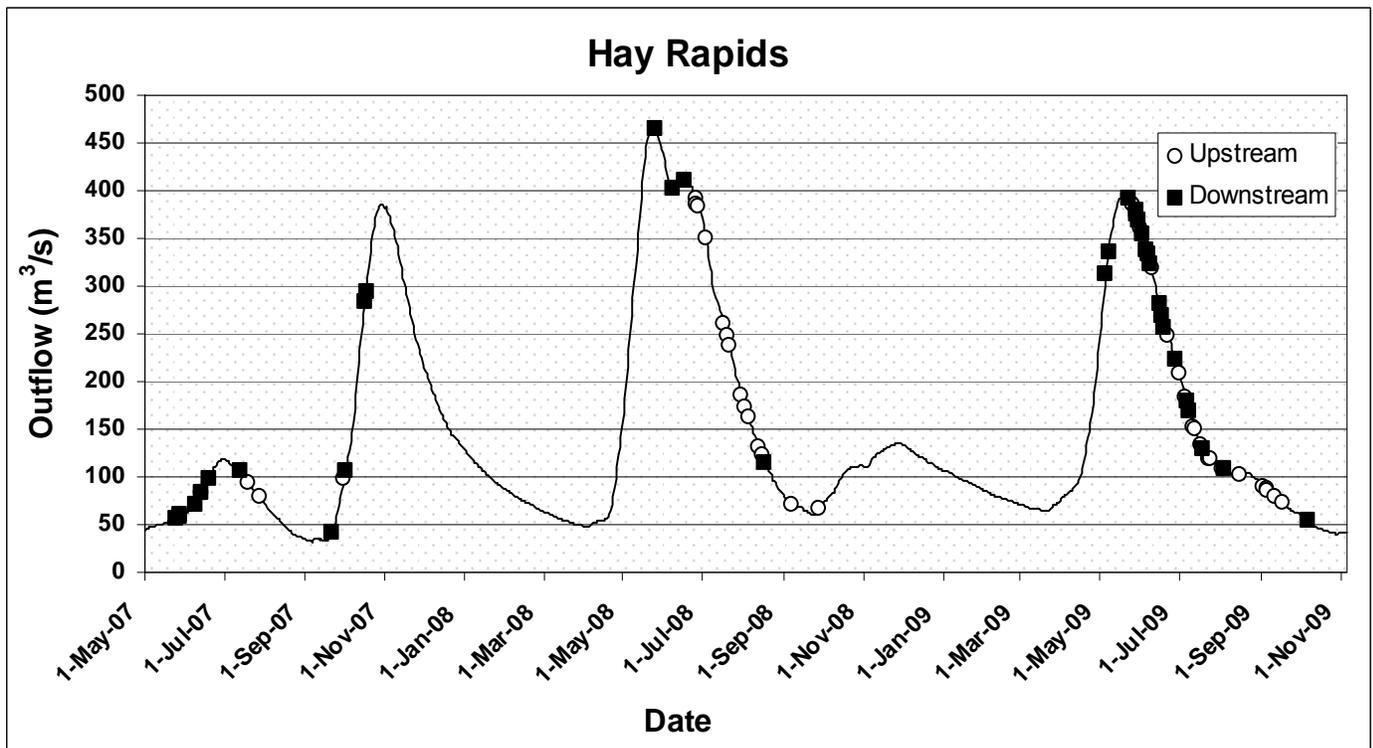
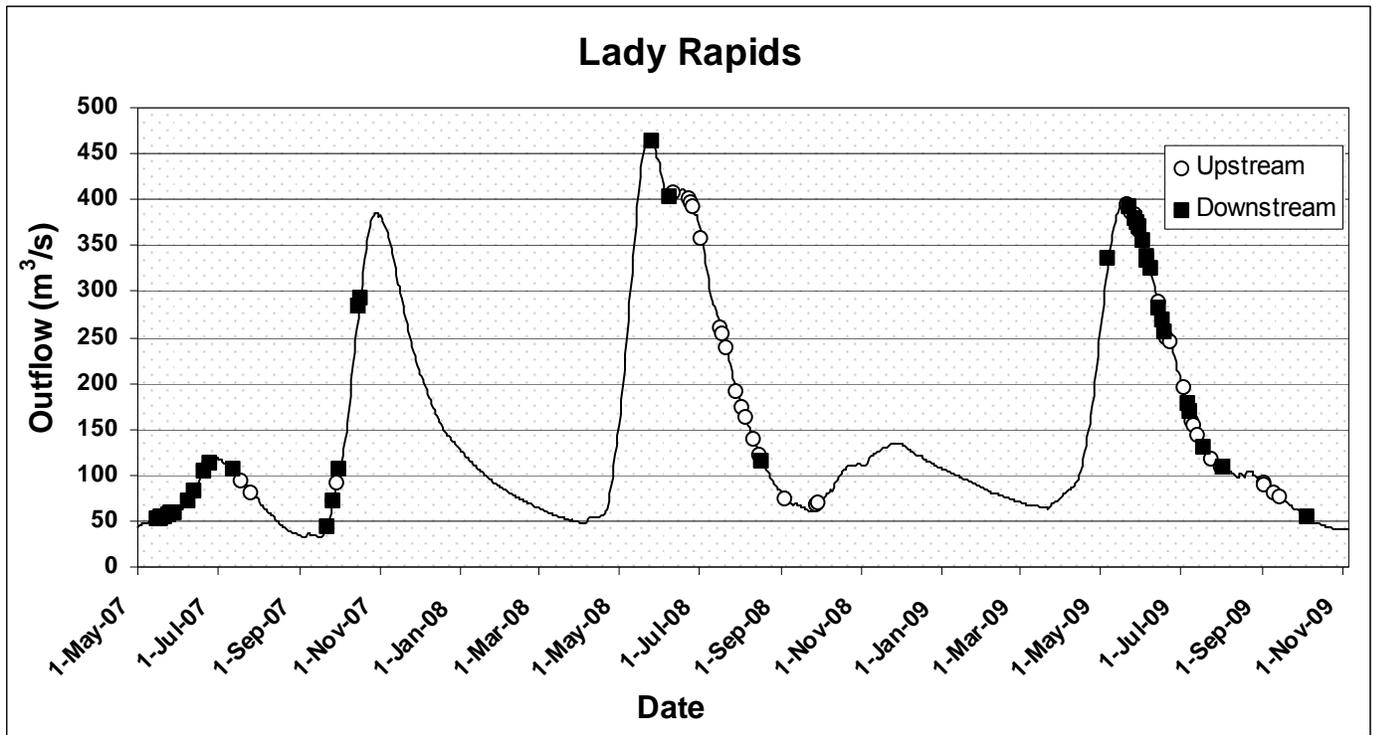
Appendix VII: Estimated water flow in Namakan River, Ontario from January, 2007 to November, 2009. Data reported as the daily mean outflow from Lac La Croix including 10%, 25%, 75% and 90% percentile flows.

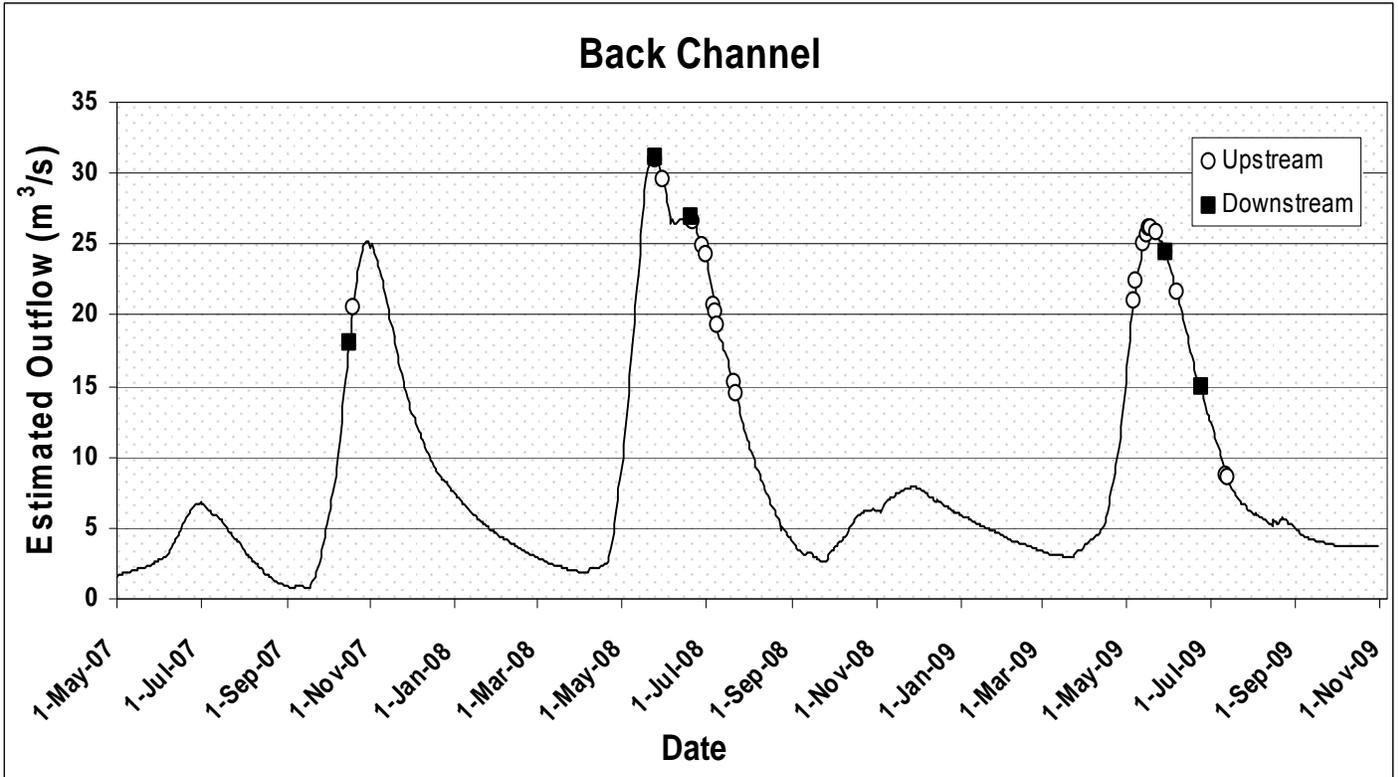
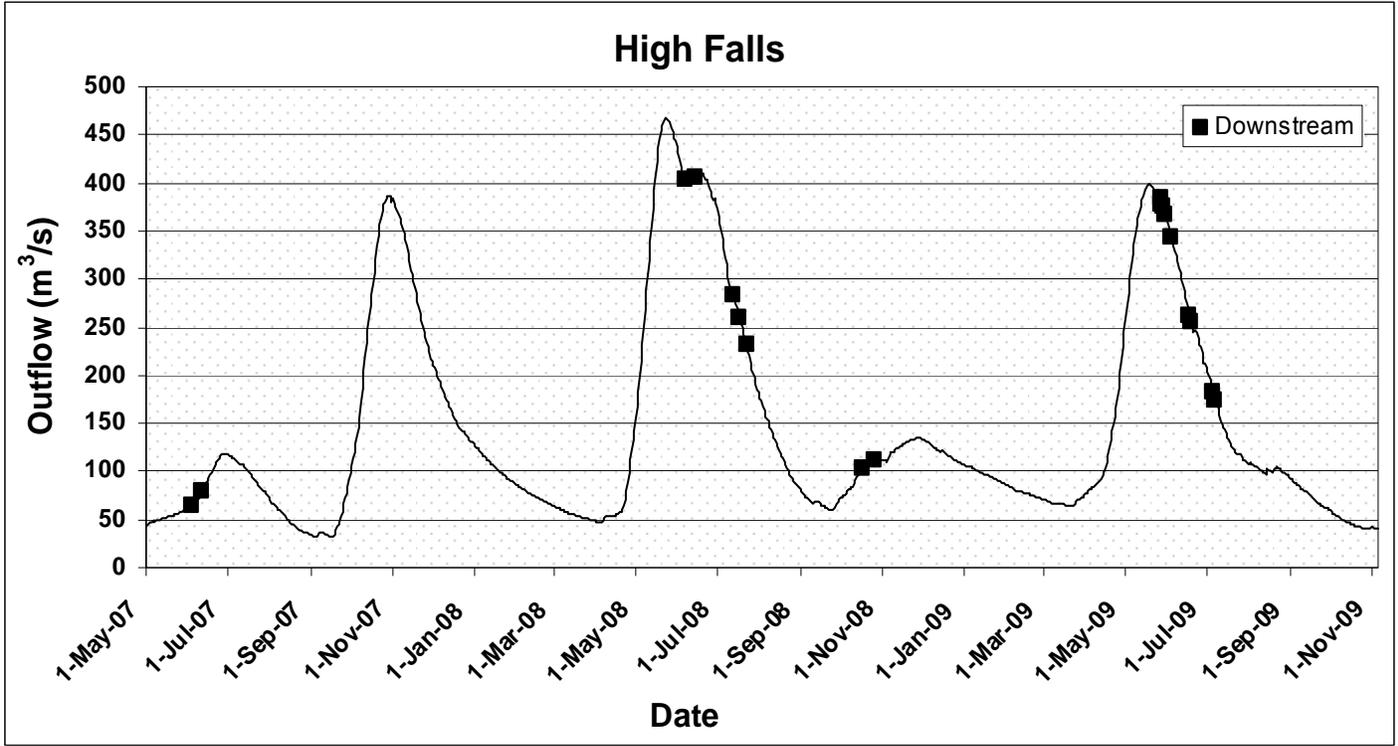


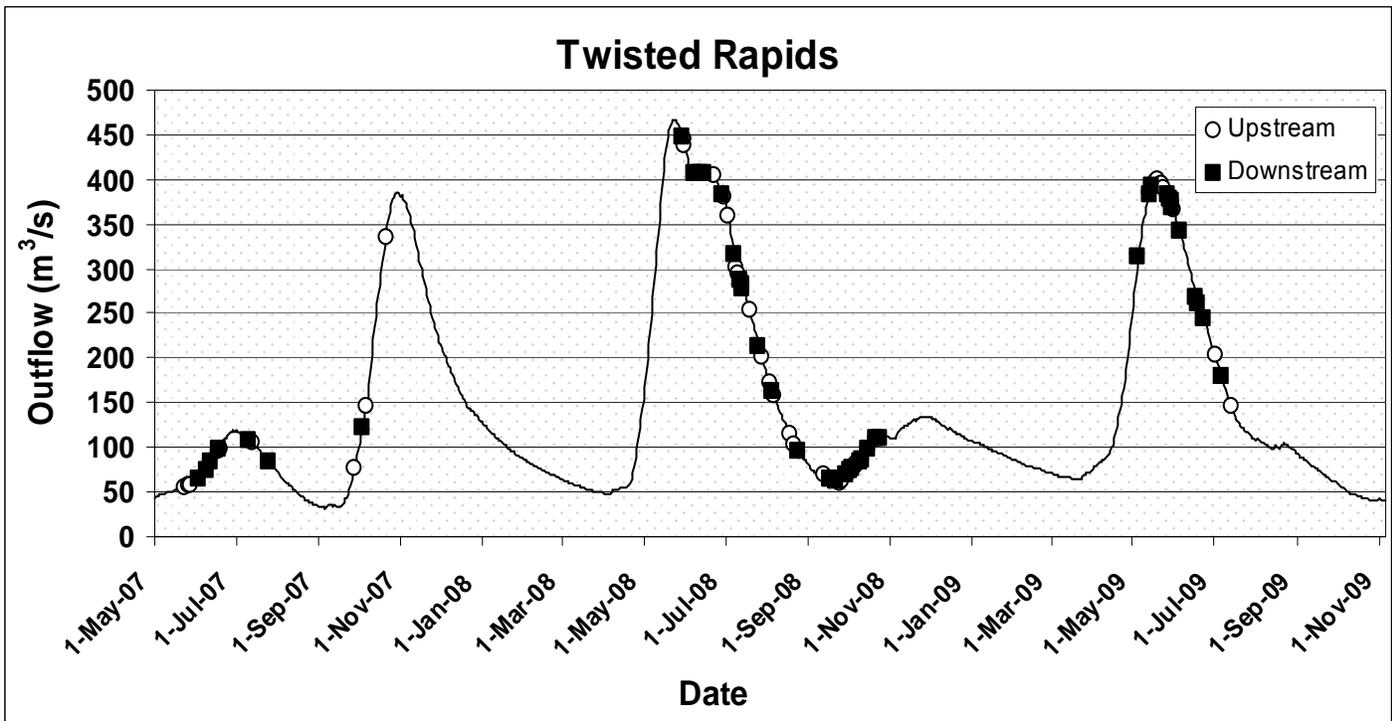
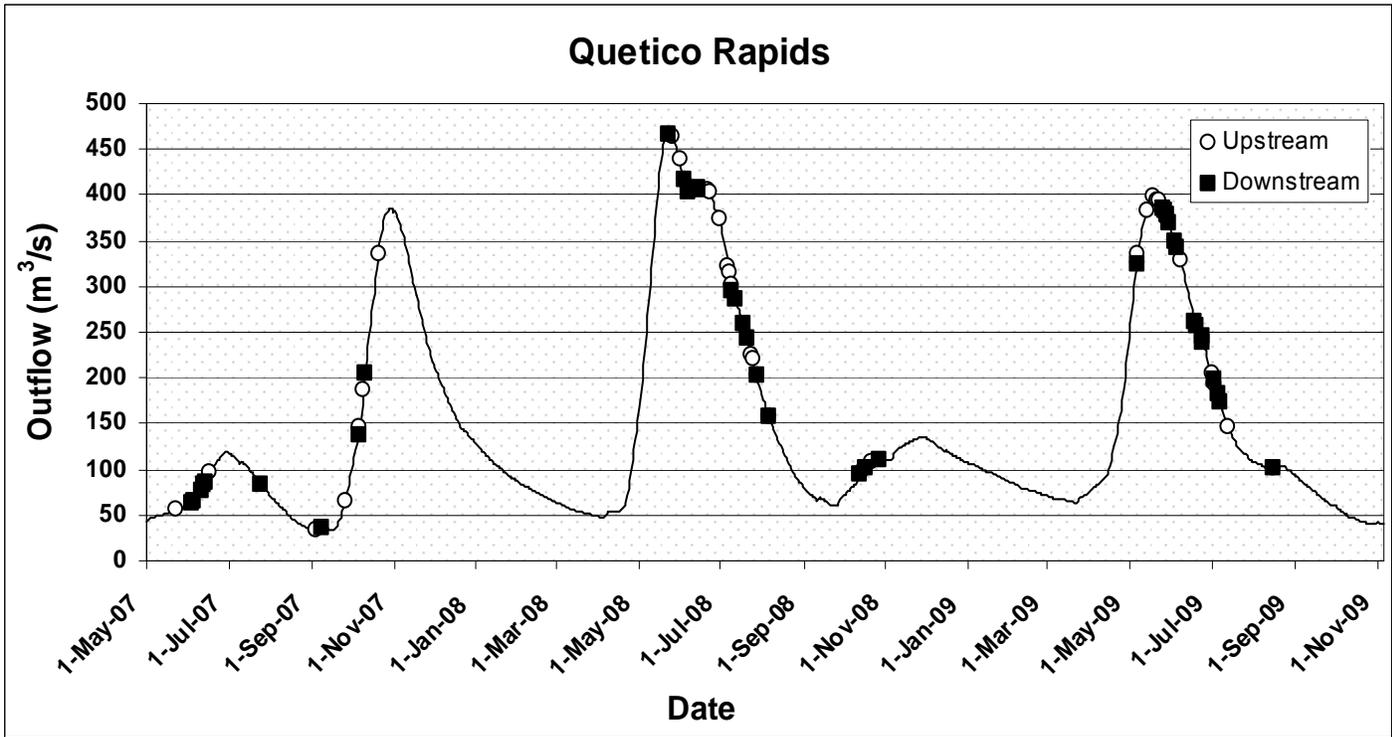
LAC LA CROIX

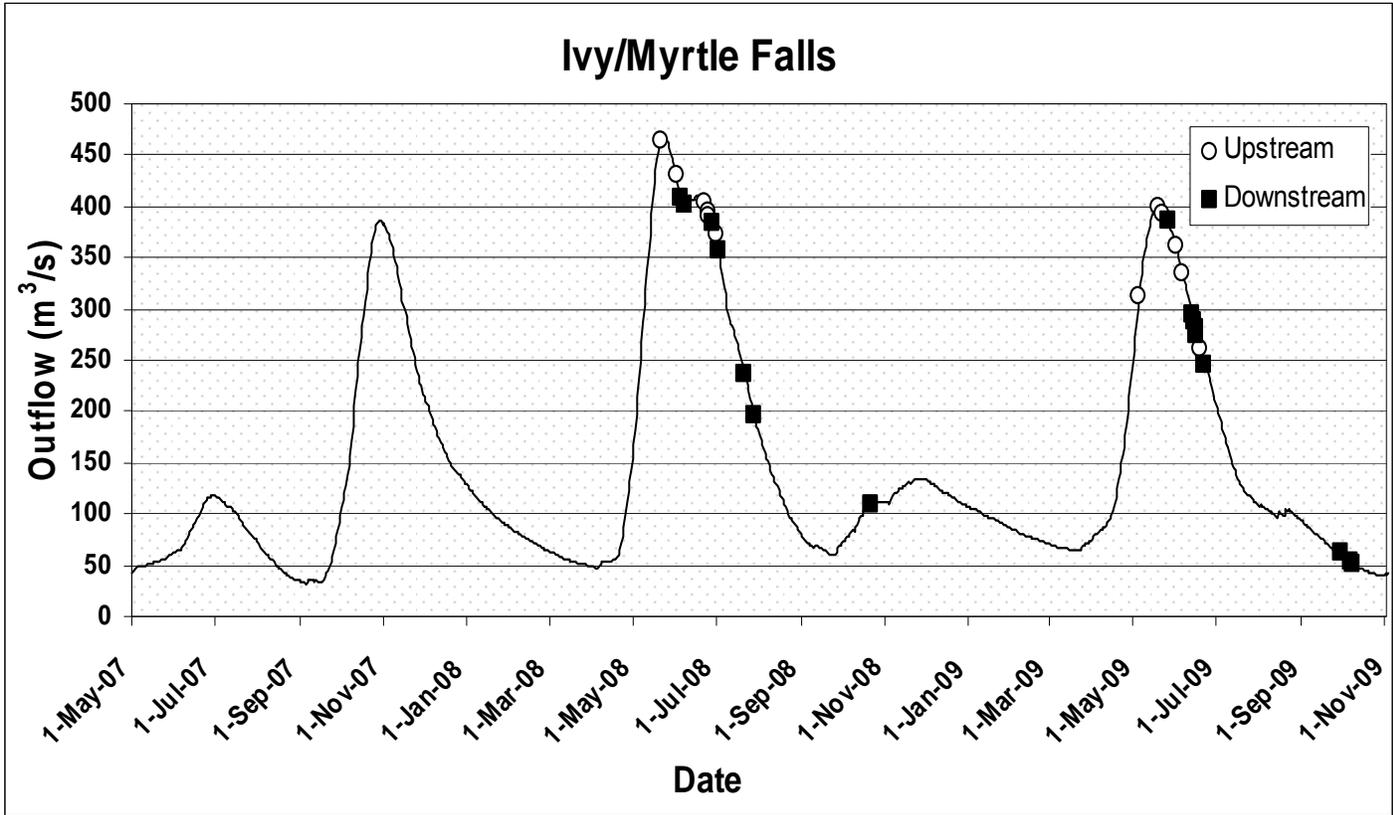


Appendix VIII: Movement of lake sturgeon through selected shallow rapids/falls in relation to daily water flows in the Namakan River, Ontario.









* upstream receiver was not deployed below Snake Falls until April 30, 2008.