



Project Summary Report

Killbear Channel and Parry Sound Lake Trout Egg Collection For Thiamine Analysis

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Executive Summary:

Trap-nets were fished in Killbear Channel and Parry Sound of Eastern Georgian Bay during the lake trout spawning period of 2008 to collect egg samples for thiamine analysis. The absence of thiamine (Vitamin B1) has been implicated as a contributing factor to the lack of lake trout reproductive success in Great Lakes waters.

A total of 111 lake trout were captured from four net-nights of fishing effort at two netting sites. Egg samples were collected from 17 ripe females encountered during the survey. Once analyzed by the Great Lakes Science Centre in Ann Arbor, Michigan, thiamine level results will be posted on their website at www.glsc.usgs.gov.

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1.0 Introduction and Purpose:

The failure of newly hatched lake trout in Great Lakes waters to survive and grow has been linked in part to a lack of thiamine (Vitamin B1) in their system (www.glsc.usgs.gov). This condition called thiamine deficiency complex (TDC), is believed to be caused by the presence of a thiamine destroying enzyme – thiaminase. This enzyme is found in alewife and smelt and it is believed that lake trout populations that rely heavily on these prey species are more susceptible to TDC.

The complexity, scope and seriousness of TDC has necessitated that natural resource agencies work together on an integrated research and monitoring program to better understand TDC and to propose and evaluate possible solutions (www.glsc.usgs.gov). To this end, the Upper Great Lakes Management Unit (UGLMU) of the Ontario Ministry of Natural Resources is working together with the Great Lakes Science Centre in Ann Arbor, Michigan. To contribute towards this thiamine monitoring initiative, the UGLMU requested the Eastern Georgian Bay Stewardship Council (EGBSC) assist through the collection of lake trout egg samples from the Davy Island and Horse Island spawning populations in 2008. The EGBSC was delighted to contribute towards this initiative.

As a secondary purpose, this project also offered a fortuitous opportunity to collect spawning population assessment data as well as information relating to lamprey scaring rates.

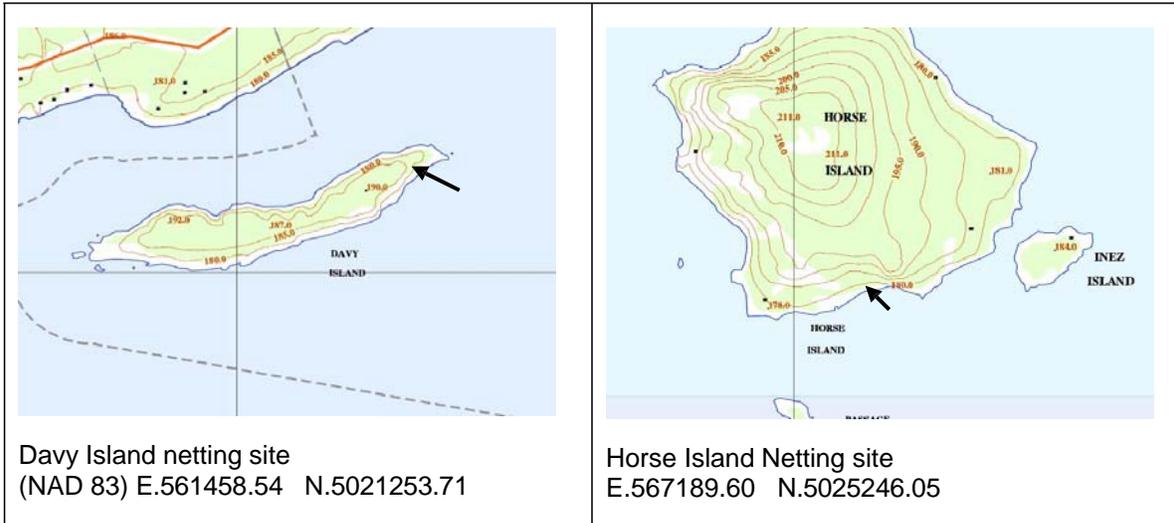
2.0 Methods:

We selected 6'-trapnets to capture lake trout because of negligible mortality associated with this gear. Nets were set October 22 at two locations: 1) the south-east corner of Davy Island in the Killbear Channel, and 2) the south-central shore of Horse Island in Parry Sound (aka the Big Sound). Leads were shortened such that approximately 50' of lead was used at each site.

The catch was completely enumerated and all captured lake trout were bio-sampled for total and fork length, round weight, sex, reproductive condition, fish tag number (if present), fin clip (if present) and the presence/absence of lamprey scars and fish lice. For females from which egg samples were collected, the leading pectoral fin ray was removed for subsequent age determination.

Approximately 10 grams of eggs (30 – 50 eggs) were collected from ripe, freely-flowing females. Egg samples were placed in zip-lock bags and held on ice while in the field and immediately frozen upon termination of daily field work. Biosampling and catch location data for individual fish from eggs were collected was recorded on scale envelopes and accompanied the frozen egg samples. Egg samples and data were transferred to an UGLMU field crew working out of Parry Sound concurrent with this project. Final destination of the egg samples for thiamine analysis was the Great Lakes Science Centre of the United States Geological Service in Ann Arbor, Michigan.

Figure 1. Location of Netting Sites



3.0 Results:

3.1 Netting Results:

From four net nights of fishing effort at two sites, we captured a total of 111 lake trout (Table 1).

Location	Date (Lifted)	# males captured	# females captured	Total
Davy Island	Oct. 23, 2008	15	6	21
Davy Island	Oct. 24, 2008	12	5	17
Horse Island	Oct. 23, 2008	27	9	36
Horse Island	Oct. 24, 2008	15	12	37

No other fish species was caught during the survey.

3.2 Egg Collection Results

Egg samples were collected from 6 fish at the Davy Island site and 11 at Horse Island (Appendix A and C). At the time of writing of this report, analysis relating to thiamine levels was not available. This information will subsequently be posted on the website of the Great Lakes Science Centre (www.glsc.usg.gov) when available.



Lake trout eggs collected for Thiamine analysis

3.3 Biosampling Results

Mean size of male and female lake trout from the two netting sites was as follows:

Sex	Netting Site	Mean Total Lg. (mm)	Mean Fork Lg. (mm)	Mean Weight (grams)
Female	Davy Is.	729	672	3093 *
	Horse Is.	733	675	3805
Male	Davy Is.	723	665	3160 *
	Horse Is.	682	613	2945

* Mean weight calculations for Davy Island male and female lake trout are an underestimate of actual mean weight as exceptionally large fish were not weighted on Oct. 23rd for fear of injury.

(See appendix A – D for raw data)

3.4 Lamprey Scaring and Fish Lice

Lamprey scaring (one or more scars evident) was observed on 51 of 111 fish handled (46%) (Appendix A – D). Two fish, included in the above count, also had open lamprey wounds evident.

Five fish had fish lice present.



Evidence of recent lamprey attack but unsuccessful attachment

3.5 Tag Data

Thirteen lake trout had 'spaghetti tags' attached (Appendix A – D). These tags are remnants of past assessment studies conducted by the Upper Great Lakes Management Unit (UGLMU). Data relating to these tags (tagging location, date affixed, size at time of tagging) is available through the UGLMU – Lake Huron Office (Owen Sound).

4.0 Discussion

The purpose of this project was to collect lake trout eggs for thiamine analysis. However, in doing so it also provided a fortuitous opportunity to collect spawning assessment data for lake trout at two distinct sites, which probably have a negligible amount of intermixing of spawners. (The sites are separated by over 10 kilometres of open water.)

Observed catch rates for Davy and Horse Islands were 19.0 and 36.5 lake trout per net set respectively. (We readily acknowledging the short netting period of only two nights and the low degree of confidence this imparts to CUE relative abundance indices.) The ease with which this project was accomplished and the seemingly high efficiency of 6'-trapnets at capturing target lake trout suggests an index netting program for these populations would be very easy to formulate and execute. The EGBSC would be interested in participating in such an index netting program on an intermittent basis (i.e. every 2 – 3 years). Furthermore, should the UGLMU wish to collect thiamine analysis data at these locations, the EGBSC would be happy to assist.

5.0 Acknowledgements

The EGBSC would like to thank the tremendous manpower assistance (six man-days) from the Parry Sound District of the Ministry of Natural Resources. Jim Palmer and Matthew Heerschap provided absolutely essential services with respect to boating, netting and sampling. Their efforts are much appreciated. Eric McIntyre of the EGBSC supervised field activities. Adam Cottrill of the UGLMU provided egg sampling directions.

Appendix A

Biosampling Data for Female Lake Trout Captured at the Davy Island Site

Date 2008	Total Lg. (mm)	Fork Lg. (mm)	Round Wt. (gr)	Condition	Lamprey	Comments
Oct.23	915	846		Green	Scar	See Note #1
Oct.23	660	609	2650	Green	Nil	
Oct.23	734	674	3300	Ripe	Nil	See Note #2
Oct.23	682	626	3700	Ripe	Nil	See Note #2
Oct.23	713	653	3500	Ripe	Scar	See Note #2; TAG 17882
Oct.23	696	642	285	Ripe	Nil	See Note #2
Oct.24	805	744	4600	Green	Nil	
Oct.24	606	558	2300	Green	Scar	
Oct.24	746	687	3800	Green	Scar	Fish Lice present
Oct.24	700	645	3200	Ripe	Nil	See Note #2
Oct.24	765	706	3600	Ripe	Nil	See Note #2
	729	672	3093.5 *		Mean	
	24.54	22.95	370.08		Standard Error	
	81.40	76.10	1170.29		Standard Deviation	
	54.69	51.13	837.18		Confidence Level(95.0%)	
	11	11	10		Sample Size	

Note #1. Weight not sampled due to fear of injuring exceptionally large fish

Note #2 Egg sample collected for thiamine analysis

* - Mean weight does not include one large female not sampled as per Note #1.

Appendix B

Biosampling Data for Male Lake Trout Captured at the Davy Island Site

Date 2008	Total Lg. (mm)	Fork Lg. (mm)	Round Wt. (gr)	Condition	Lamprey	Comments
Oct.23	755	690	3600	Ripe	Nil	
Oct.23	819	760	4600	Ripe	Nil	
Oct.23	910	846		Ripe	Nil	See Note #1
Oct.23	622	576	2350	Ripe	Nil	
Oct.23	756	695	4200	Ripe	Nil	
Oct.23	765	691	3750	Ripe	Scar	
Oct.23	769	704	3700	Ripe	Scar	
Oct.23	869	796		Ripe	Scar	See Note #1
Oct.23	721	663	2700	Ripe	Nil	Tag 6102?
Oct.23	574	525	1400	Ripe	Nil	
Oct.23	776	716	4000	Ripe	Scar	
Oct.23	690	640	2600	Ripe	Nil	
Oct.23	689	637	2600	Ripe	Nil	
Oct.23	679	621	2500	Ripe	Scar	Fish Lice present
Oct.23	645	590	2000	Ripe	Nil	
Oct.24	800	735	4400	Ripe	Scar	
Oct.24	659	600	2200	Ripe	Nil	
Oct.24	795	730	4400	Ripe	Nil	
Oct.24	845	782	5300	Ripe	Nil	
Oct.24	643	595	2400	Ripe	Scar	Tag 21587
Oct.24	808	739	4500	Ripe	Scar	
Oct.24	593	545	1800	Ripe	Scar	
Oct.24	770	719	4000	Ripe	Nil	
Oct.24	635	588	2500	Ripe	Scar	
Oct.24	680	625	2900	Ripe	Scar	Tag 20657
Oct.24	666	608	2600	Ripe	Nil	
Oct.24	600	548	2000	Ripe	Nil	
	723	665	3160 *		Mean	
	17.20	16.06	211.09		Standard Error	
	89.39	83.43	1055.44		Standard Deviation	
	35.36	33.00	435.67		Confidence Level(95.0%)	
	27	27	25		Count	

Note #1. Weight not recorded for fear of injuring exceptionally large fish

* Note - Mean weight not accurate due to two samples absent as per Note #1

Appendix C

Biosampling Data for Female Lake Trout Captured at the Horse Island Site

Date 2008	Total Lg. (mm)	Fork Lg. (mm)	Round Wt. (gr)	Condition	Lamprey	Comments
Oct.23	740	684	3700	Green	Scar	
Oct.23	765	699	5000	Green	Scar	
Oct.23	831	746	6200	Green	Nil	
Oct.23	697	633	3300	Green	Nil	
Oct.23	701	659	2800	Ripe	Scar	Eggs Collected
Oct.23	750	696	3450	Ripe	Nil	Eggs Collected
Oct.23	721	668	3500	Ripe	Nil	Eggs Collected
Oct.23	781	716	3800	Ripe	Scar	Eggs Collected
Oct.23	724	663	2500	Ripe	Nil	Eggs Collected
Oct. 24	760	704	4700	Green	Scar	
Oct. 24	721	665	4300	Green	Scar	Tag 21929
Oct. 24	725	663	3650	Ripe	Scar	Eggs Collected
Oct. 24	664	605	2500	Green	Wound	
Oct. 24	715	660	3400	Green	Scar	
Oct. 24	733	674	3700	Green	Nil	
Oct. 24	790	735	5000	Green	Scar	
Oct. 24	656	605	2900	Ripe	Nil	Eggs Collected
Oct. 24	726	670	3500	Ripe	Scar	Eggs Collected
Oct. 24	810	742	5000	Ripe	Scar	Eggs Collected
Oct. 24	694	638	3400	Ripe	Scar	Eggs Collected
Oct. 24	697	644	3600	Ripe	Nil	Eggs Collected
	733	675	3805		Mean	
	9.74	8.67	202.86		Standard Error	
	44.61	39.74	929.64		Standard Deviation	
	20.31	18.09	423.17		Confidence Level(95.0%)	
	21	21	21		Sample Size	

Appendix D

Biosampling Data for Male Lake Trout Captured at the Horse Island Site

Date 2008	Total Lg. (mm)	Fork Lg. (mm)	Round Wt. (gr)	Lamprey	Comments
Oct.23	671	618	2600	Scar	
Oct.23	687	634	3100	Scar	
Oct.23	674	629	2900	nil	
Oct.23	651	600	2200	nil	Tag 20580
Oct.23	700	640	2900	Scar	Tag 10081
Oct.23	635	584	2400	nil	Fish Lice
Oct.23	651	600	2500	nil	
Oct.23	620	570	2400	Scar	
Oct.23	706	657	3000	Scar	
Oct.23	743	681	4100	Scar	
Oct.23	746	68	3900	Scar	Tag 21700
Oct.23	716	665	3100	nil	Tag 17851
Oct.23	675	624	3300	Scar	
Oct.23	674	615	2800	Scar	
Oct.23	675	616	2500	Scar	
Oct.23	636	570	2100	nil	
Oct.23	721	668	3300	Scar	
Oct.23	710	659	3400	nil	
Oct.23	701	651	3200	nil	
Oct.23	625	573	2100	nil	
Oct.23	700	639	2900	Scar	
Oct.23	715	675	3400	nil	
Oct.23	589	544	1800	nil	Fish Lice
Oct.23	568	517	1600	nil	Fish Lice
Oct.23	611	560	2300	nil	
Oct.23	807	746	5000	Scar	Tag-unreadable
Oct.23	654	596	2400	nil	
Oct.24	725	670	3300	Scar	Tag 2688?
Oct.24	602	550	2100	nil	
Oct.24	647	595	2500	Scar&wound	
Oct.24	587	535	1900	nil	
Oct.24	794	736	4500	Scar	
Oct.24	744	696	3800	Scar	Tag 10033 / RP Clip
Oct.24	778	724	4200	Scar	Tag 20721
Oct.24	640	581	3400	nil	
Oct.24	715	660	3400	Scar	
Oct.24	725	665	3300	Scar	
Oct.24	725	665	3600	Scar	
Oct.24	691	635	2900	Scar	
Oct.24	629	578	2000	Scar	
Oct.24	671	614	2800	nil	
Oct.24	705	648	2800	nil	
	682	613	2945		Mean
	55.21	101.18	748.40		Standard Deviation
	17.20	31.53	233.22		Confidence Level(95.0%)
	42	42	42		Count