Appendix V5-6A

Hope Bay Belt Project, Metal Concentrations in Fish Tissues from Five Lakes in the Hope Bay Belt, Nunavut

Tyson

BHP DIAMONDS INC.
HOPE BAY BELT PROJECT

METAL CONCENTRATIONS IN FISH TISSUES FROM FIVE LAKES IN THE HOPE BAY BELT, NUNAVUT

Prepared for:

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METAL CONCENTRATIONS IN FISH TISSUES FROM FIVE LAKES IN THE HOPE BAY BELT, NUNAVUT

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1. Introduction

1. INTRODUCTION

In May 1998, BHP Minerals of Canada Inc. amalgamated with BHP Diamonds Inc., and assumed ownership of the Hope Bay Belt Project. The Project includes the Boston, Doris Lake, and Madrid properties, the proposed Roberts Bay port site, Hope Bay, and a winter road corridor connect these areas. These properties are located 50 km east of Omingmaktok, Nunavut (Figure 1-1). Until the amalgamation, BHP Minerals had managed the environmental baseline study. The intent of this program is to generate a comprehensive database of biophysical, socioeconomic, heritage, and cultural information needed for exploration and future development approvals.

As a component of the baseline fisheries program, dorsal myomere (muscle) and livers were collected from lake trout (*Salvelinus namaycush*) and lake whitefish (*Coregonus clupeaformis*; where present) from selected lakes. These lakes were selected for their proximity to potential development activities. Tissues were collected from fishes from Doris, Patch, and Windy at the Doris Lake Property and Aimaoktak (Spyder) Lake at the Boston Property in 1997 (Figure 1-2). In 1998, tissues were collected from fishes from Patch Lake (selected as a regional reference lake; Figure 1-2). The Aimaoktak Lake samples were processed in 1997 and the remaining tissues were held in storage for analysis in 1998.

In 1998, the environmental baseline program was reduced to match a decrease in exploration activity as BHP's operations moved from active exploration to a care and maintenance phase. Because of these changing circumstances, the analyses of the previously collected tissue samples were initially deferred indefinitely. However, to obtain meaningful results from the frozen tissue samples, analyses should be conducted within two years of sample collection (Mr. Fred Chen, Senior Analyst, Analytical Services Laboratories, *pers. comm.*). Storage beyond two years would likely lead to sample degradation and thus inaccurate results.

The lakes of the Hope Bay Belt are ultra-oligotrophic (Rescan 1998). As such, the productivity of the fish communities is relatively low. These communities are characterized by long-lived, slow-growing fishes (Rescan 1998; 1999). Therefore,

Cad No. C1081 Sht. 16 View L1 Job No. 526-9 1998 Hope Bay 03/26/1999- 9:25am RES_BL Hope Bay Belt Project

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Scale 1 : 280,000

460,000m E

440,000m E

420,000m E

7,560,000m N

7,540,000m N

7,520,000m N

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7,480,000m N

BLUE INLET

ROBERTS BAY

HOPE BAY

MELVILLE SOUND

PARRY BAY

KENT PENINSULA

Angimajuq River

Angimajuq River

Pelvic

Ogama

Patch

Tail

Doris Lake

Wolverine

Windy Lake Camp

Windy

Aimaoktak

Boston Camp

Trout

Stickleback

Boston Reference

Kolignuk River

LEGEND :

STUDY AREAS

Figure 1 - 2

BHP

Locations of Study Lakes and Marine Areas, Hope Bay Belt

Rescan

the fish communities are sensitive to disturbances, such as fishing. The Hope Bay Belt continues to be a promising resource for future development. As part of the environmental assessment that will be required, baseline tissue metals data will be needed. Therefore if the samples were allowed to degrade, new samples would need to be collected. As the fish communities have already been characterized, collecting additional tissue samples would be costly and the removal of additional fishes would be deleterious to the resident fish communities.

The Department of Fisheries and Oceans (DFO), Iqaluit, recognized that the tissues held in storage represented a valuable source of baseline information for fish communities in the northern Slave Geological Province of Nunavut.

As a result, a cooperative effort was undertaken between BHP and DFO whereby both parties shared the costs and results of the tissue analyses. DFO contributed funding to complete the tissue analysis. BHP contributed funding for the data analysis and reporting, in addition to expenses already incurred for the collection and processing of the tissues.

Rescan™ Environmental Services Ltd. was contracted to facilitate the analysis of the tissues and resultant data and to generate the following report. Contained in this report are the results of the tissue analyses for Doris, Patch, Pelvic, and Windy lakes. In addition, the results for Aimoaktak Lake (analyzed in 1997) are also presented.

2. Methods

2. METHODS

Tissue samples were collected from fishes of four Doris Property lakes (Doris, Patch, Pelvic, and Windy) and one Boston Property lake (Aimoaktak). All fishes were captured during the lake survey programs of 1997 and 1998 using index gill nets.

2.1 Fish Collection

Index gill net gangs consisted of three panels of 3.8 cm (1.5") mesh. Each panel measured 15.0 m long by 2.44 m deep for an area of 36.6 m^2 and a total area of 109.8 m^2 per gang. Index gangs were deployed in what are termed "rounds". During a round, three to four index gangs were set in succession and soaked for 60 minutes. The gangs were then retrieved in order of setting and the captured fishes were sampled. Once the fishes were sampled, the gangs were re-deployed for another round. All surveys were evening surveys: conducted between 2000 hr and midnight.

An Arctic Lake Trout Index Gillnetting (ALTIG) program was designed and first implemented at the BHP Ekati Mine site in 1994 (McCarthy 1997). The basis for the program was an Ontario Ministry of Natural Resources Fisheries Assessment Unit index gillnetting design developed to assess the abundance of lake trout in Ontario lakes (Willox and Lester 1994). A trial ALTIG program concluded that single mesh size nets (3.8 cm) provided essentially the same data as the three mesh sizes used in Ontario but with fewer fish mortalities (3.8, 5.1, 6.4 cm; McCarthy 1997).

Though there are other survey methods available to sample fish communities, gill nets provide a highly effective means of sampling large numbers of fishes. When used in an ALTIG program, they provide a standardized methodology that generates quantitative data. Other methods such as trap nets and beach seines are dependent on shoreline gradient and substrate type for positioning. Hence, sampling opportunities are reduced, if even possible. Gill nets are independent of these factors and can be used for waterbodies that are inaccessible to trap nets and beach seines. Incidental mortalities, the greatest concern with gill nets, are minimized by restricting the soaking time to no greater than 60 minutes (McCarthy 1997).

All captured fishes were identified to species, measured for fork length (mm), weighed (gm), sampled for aging structures, and released. Left pectoral fins were used for aging structures. In addition, all fishes over 300 mm were marked with a uniquely numbered Floy anchor tag. For mortalities, sex, maturity, and reproductive status were recorded, and otoliths and stomachs were removed for aging and content analysis, respectively.

2.2 Tissue Collection

Dorsal myomere (muscle) samples and livers were collected opportunistically from lake trout (*Salvelinus namaycush*), and lake whitefish (*Coregonus clupeaformis*) mortalities. Samples were collected following the procedures outlined in the British Columbia Field Sampling Manual (MELP 1996). A minimum of 100 gm of myomere tissue was collected from each fish, as well as the complete liver, minus the bile gland. Samples were individually stored in labeled, clean plastic Whirl-Pac bags until analysis. Analyses were conducted by Analytical Services Laboratories Ltd. (Vancouver, British Columbia). Trace metals and the methods used for analyses are listed in Table 2-1. For each species and tissue type in each lake, results were combined and presented as a mean.

2.3 Data Analysis

Mean tissue concentrations for 19 trace metals were calculated. For results that were less than the detection limit, values of one half the detection limit were employed when calculating mean concentrations of trace metals in tissues. This method was used by Swyripa *et al.* (1993) and Harbicht and Ash (1991) for fish tissues from Trout Lake, Northwest Territories and Contwoyto Lake, Nunavut, respectively.

Tissue mercury concentrations were regressed against age and fork length of fishes. Mercury concentrations were presented on the dependent axis (Y) and the age or fork length of the fish on the independent axis (X). For lake whitefish, the age and fork length were transformed into logarithmic values. This was found to result in a more significant relationship. A basic linear regression was performed and the regression line equations and R^2-values calculated.

Table 2-1
Detection Limits and Methods for Determining Metal Concentrations in Fish Tissue

Element	Detection Limit[1] (mg/kg, wet weight)	Method[2]
Aluminum	5	ICP
Arsenic	0.05	HVAAS
Barium	0.5	ICP
Beryllium	0.2	ICP
Cadmium	0.02	ICP
Calcium	10	ICP
Chromium	0.5	ICP
Cobalt	0.5	ICP
Copper	0.5	ICP
Iron	1	ICP
Lead	0.05	GFAAS
Magnesium	0.05	ICP
Manganese	0.2	ICP
Mercury	0.005	CVAAS
Molybdenum	1	ICP
Nickel	1	ICP
Selenium	0.1	HVAAS
Silver	0.1	ICP
Zinc	0.3	ICP

1: All detection limits are based on a minimum of 15 grams (dry weight) of sample
2: CVAAS = Cold Vapor Atomic Absorption Spectrophotometry
GFAAS = Graphite Furnace Atomic Absorption Spectrophotometry
HVAAS = Hydride Vapor Atomic Absorption Spectrophotometry
ICP = Inductively Coupled Argon Plasma/Atomic Emission Spectrophotometry

3. Results and Discussion

3. RESULTS AND DISCUSSION

Tissue samples were collected from fishes captured during the Hope Bay Belt environmental baseline fisheries surveys (Rescan 1998, 1999). These surveys were conducted in August, 1997, and August, 1998. The following sections present the results and brief discussions of the tissue analyses for trace metals concentrations in fish tissues from selected Hope Bay Belt lakes.

3.1 Fish Sampling

A total of 219 fishes (118 lake trout and 101 lake whitefish) from Aimaoktak, Doris, Patch, Pelvic, and Windy lakes were sampled for tissues (Table 3-1). Fishes were harvested from Aimaoktak, Doris, Patch, and Windy lakes in August, 1997, and from Pelvic Lake in August, 1998. The tissues from Aimaoktak Lake were analyzed and reported in 1997 (Rescan 1998). The remaining tissues were analyzed in February, 1999. The data codes and raw data are presented in appendices 3-1 to 3-6.

Table 3-1
Number of Fishes and Tissues Sampled per Species from Hope Bay Belt Lakes, 1997 and 1998

	Species				
	LKTR		LKWH		
Lake	Myomere	Liver	Myomere	Liver	TOTAL
Doris	22	22	29	29	102
Patch	25	25	26	26	102
Windy	25	25	None Present		50
Aimaoktak	25	25	24	24	98
Pelvic	21	21	22	22	86
TOTAL	**118**	**118**	**101**	**101**	**438**

Where possible, young adult fishes were sampled. Large adult fishes, especially lake trout, were released. This is because large lake trout impose a significant degree of control on the fish community dynamics in lakes (Welch and Klings 1996). The removal of large, older lake trout typically results in a destabilization of the lake fish community and subsequently requires a number of years to restabilize.

3.2 Trace Metals

The mean tissue concentrations of 19 trace metals were calculated. These results are presented in Tables 3-2 to 3-6. Although analyses provide results for all 19 trace metals, brief discussions of four key trace metals (arsenic, cadmium, copper, and lead) are presented below, followed by a more detailed discussion of mercury.

3.2.1 Arsenic

Arsenic is a cumulative toxin, bioaccumulating in fish tissues such as liver and myomere (Falk *et al.*, 1973). Dressed myomere tissue concentrations for human consumption have been set by the Canadian Food and Drug Directorate (CFDD) at 5 ppm. The highest arsenic concentrations were found in Windy Lake lake trout (Table 3-4). The mean myomere tissue concentration (0.82±0.037 ppm) was well below the guideline limit of 5 ppm. The mean liver tissue concentration (4.20±0.351 ppm) was also below the guideline limit.

3.2.2 Cadmium

Cadmium is known to accumulate in gill, kidney, liver, and, to a lesser extent, myomere tissues (Sprague, 1987). Cadmium is also known to occur in higher concentrations in fishes of the lower trophic levels (Windom *et al.*, 1973). These conditions held true for the Hope Bay Belt tissues. Cadmium was not detectable in myomere tissue of either lake trout or lake whitefish (Tables 3-2 to 3-6). However, it was detected in liver tissues and was found to be at higher concentrations in whitefish. The highest mean concentration of Cadmium was found in Pelvic Lake whitefish (0.88±0.110 ppm; Table 3-6).

3.2.3 Copper

Copper is a biologically essential trace metal that at high concentrations is toxic (Forstner and Wittman, 1979). However, copper does not bioaccumulate as most of it is excreted (Falk *et al.*, 1973). The CFDD guideline for dressed myomere tissue is 100 ppm (Falk *et al.*, 1973). Copper was not detectable in myomere tissue of either lake trout or lake whitefish (Tables 3-2 to 3-6). However, copper was present in livers of both species. The highest mean concentration was in Windy Lake trout (222±22.9 ppm). The higher concentrations of copper in livers is not unexpected. Copper is an essential constituent in metalloenzymes (Demayo *et al.*, 1982).

3.2.4 Lead

Lead is known to bioaccumulate in the bones, scales, kidney, and liver of fishes (Spry and Wiener, 1991). However, it neither biomagnifies nor does it increase with size and age. CFDD guidelines for dressed fish myomere is 10 ppm. Lead was not found in any of the myomere samples from lake trout or lake whitefish (Tables 3-2 to 3-6). Lead was only detected in a portion of the liver samples from Pelvic Lake whitefish (Table 3-6). The mean concentration of lead was found to be 0.58±0.054 ppm.

Table 3-2
Mean Concentrations of Metals (ppm) in Lake Trout and Lake Whitefish Tissues from Doris Lake, 1997

		Lake Trout				Lake Whitefish			
Tissue		Myomere		Liver		Myomere		Liver	
Number		Mean	se	Mean	se	Mean	se	Mean	se
Length (mm)		637	29.0			446	7.1		
Weight (g)		2772	404.9			1224	68.2		
Age (yr)		30	2.7			29	2.8		
Moisture	%	80.0	0.38	78.7	0.55	79.9	0.32	80.1	0.32
Aluminum	T-Al	<5		3.48	0.562	<5		4.11	0.585
Arsenic	T-As	0.057	0.0061	0.039	0.0049	<0.05		0.075	0.0093
Barium	T-Ba	<5		<5		<5		<5	
Beryllium	T-Be	<0.2		<0.2		<0.2		<0.2	
Cadmium	T-Cd	<0.02		0.020	0.0023	<0.02		0.039	0.0040
Calcium	T-Ca	127.3	14.98	63.2	2.86	155.9	10.49	107.8	25.62
Chromium	T-Cr	<0.5		<0.5		<0.5		<0.5	
Cobalt	T-Co	<0.5		<0.5		<0.5		<0.5	
Copper	T-Cu	<0.5		13.1	1.22	<0.5		3.90	0.338
Iron	T-Fe	2.32	0.138	217.7	29.06	2.68	0.133	128.2	11.12
Lead	T-Pb	<0.05		<0.05		<0.05		<0.05	
Magnesium	T-Mg	235.9	4.69	131.0	3.98	240.9	3.51	144.3	3.29
Manganese	T-Mn	0.105	0.0046	1.23	0.054	0.136	0.0108	1.89	0.073
Mercury	T-Hg	0.28	0.029	0.51	0.064	0.066	0.0059	0.168	0.0178
Molybdenum	T-Mo	<1		<1		<1		<1	
Nickel	T-Ni	<1		<1		<1		<1	
Selenium	T-Se	0.20	0.005	1.10	0.061	0.195	0.0017	1.03	0.012
Silver	T-Ag	<0.1		0.100	0.0100	<0.1		<0.1	
Zinc	T-Zn	2.88	0.045	29.2	0.97	2.60	0.012	21.0	0.13

Table 3-3
Mean Concentrations of Metals (ppm) in Lake Trout and Lake Whitefish Tissues from Patch Lake, 1997

		Lake Trout				Lake Whitefish			
Tissue		Myomere		Liver		Myomere		Liver	
Number		Mean	se	Mean	se	Mean	se	Mean	se
Length (mm)		625	25.5			425	5.7		
Weight (g)		2524	288.4			1012	46.9		
Age (yr)		23	1.4			24	1.4		
Moisture	%	79.1	0.36	79.0	0.45	79.5	0.23	76.9	0.66
Aluminum	T-Al	<5		8.04	2.167	<5		7.15	0.686
Arsenic	T-As	0.080	0.0082	0.112	0.0173	0.070	0.0058	0.258	0.0288
Barium	T-Ba	<0.5		<0.5		<0.5		<0.5	
Beryllium	T-Be	<0.2		<0.2		<0.2		<0.2	
Cadmium	T-Cd	<0.02		0.030	0.0049	<0.02		0.064	0.0076
Calcium	T-Ca	154.0	13.43	64.8	3.56	181.3	11.30	94.5	16.18
Chromium	T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	
Cobalt	T-Co	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	
Copper	T-Cu	<0.5		12.6	1.46	<0.5		4.6	0.52
Iron	T-Fe	2.60	0.163	348.1	61.87	2.52	0.033	131.7	3.51
Lead	T-Pb	<0.05		<0.05		<0.05		<0.05	
Magnesium	T-Mg	252.0	3.97	119.8	5.15	263.1	2.73	149.2	2.77
Manganese	T-Mn	<0.2		1.21	0.072	<0.2		1.70	0.063
Mercury	T-Hg	0.392	0.0331	0.692	0.0743	0.120	0.0112	0.393	0.0380
Molybdenum	T-Mo	<1		<1		<1		<1	
Nickel	T-Ni	<1		<1		<1		<1	
Selenium	T-Se	0.220	0.0082	1.642	0.1238	0.215	0.0072	1.627	0.0643
Silver	T-Ag	<0.1		<0.1		<0.1		<0.1	
Zinc	T-Zn	2.62	0.048	28.42	1.471	2.49	0.041	27.13	0.792

Table 3-4
Mean Concentrations of Metals (ppm) in Lake Trout Tissues from Windy Lake, 1997

		Lake Trout			
Tissue		Myomere		Liver	
Number		Mean	se	Mean	se
Length (mm)		434	4.4		
Weight (g)		845	24.1		
Age (yr)		18	1.2		
Moisture	%	79.3	0.30	78.8	0.57
Aluminum	T-Al	<5		15.6	2.29
Arsenic	T-As	0.082	0.0037	0.420	0.0351
Barium	T-Ba	<0.5		<0.5	
Beryllium	T-Be	<0.2		<0.2	
Cadmium	T-Cd	<0.02		<0.02	
Calcium	T-Ca	120.0	9.04	58.1	1.91
Chromium	T-Cr	<0.5		<0.5	
Cobalt	T-Co	<0.5		<0.5	
Copper	T-Cu	<0.5		22.2	2.29
Iron	T-Fe	3.8	0.28	370.9	52.8
Lead	T-Pb	<0.05		<0.05	
Magnesium	T-Mg	267.4	3.34	142.7	4.19
Manganese	T-Mn	<0.2		1.09	0.058
Mercury	T-Hg	0.036	0.0030	0.056	0.0062
Molybdenum	T-Mo	<1		<1	
Nickel	T-Ni	<1		<1	
Selenium	T-Se	0.488	0.0088	1.960	0.1254
Silver	T-Ag	<0.1		0.032	0.0138
Zinc	T-Zn	2.65	0.031	34.18	1.305

Table 3-5
Mean Concentrations of Metals (ppm) in Lake Trout and Lake Whitefish Tissues from Aimaoktak Lake, 1997

		Lake Trout				Lake Whitefish			
Tissue		Myomere		Liver		Myomere		Liver	
Number		Mean	se	Mean	se	Mean	se	Mean	Se
Length (mm)		505	17.3			473	7.2		
Weight (g)		1468	150.5			1402	69.4		
Age (yr)		18	1.1			28	1.9		
Moisture	%								
Aluminum	T-Al	<5		<5		<5		<5	
Arsenic	T-As	0.030	0.0030	<0.05		0.035	0.0037	<0.05	
Barium	T-Ba	<0.5		<0.5		<0.5		<0.5	
Beryllium	T-Be	<0.2		<0.2		<0.2		<0.2	
Cadmium	T-Cd	<0.02		<0.02		<0.02		0.0125	0.00124
Calcium	T-Ca	97.2	7.80	6.52	0.779	95.5	6.36	<10	
Chromium	T-Cr	<0.5		<0.5		<0.5		<0.5	
Cobalt	T-Co	<0.5		<0.5		<0.5		<0.5	
Copper	T-Cu	<0.5		1.02	0.129	<0.5		0.70	0.086
Iron	T-Fe	2.6	0.16	1332.9	579.58	2.7	0.18	179.9	17.42
Lead	T-Pb	<0.05		<0.05		<0.05		<0.05	
Magnesium	T-Mg	258.8	2.71	15.3	0.53	288.6	5.40	16.6	0.55
Manganese	T-Mn	<0.2		<0.2		<0.2		0.146	0.0170
Mercury	T-Hg	0.369	0.0364	0.060	0.0731	0.223	0.0217	0.763	0.1106
Molybdenum	T-Mo	<1		<1		<1		<1	
Nickel	T-Ni	<1		<1		<1		<1	
Selenium	T-Se	0.196	0.0040	0.069	0.0109	0.217	0.0078	0.160	0.0180
Silver	T-Ag	<0.1		0.120	0.0141	<0.1		0.132	0.0288
Zinc	T-Zn	2.58	0.055	2.772	0.1138	2.89	0.0392	2.74	0.104

Table 3-6
Mean Concentrations of Metals (ppm) in Lake Trout and Lake Whitefish Tissues from Pelvic Lake, 1998

		Lake Trout				Lake Whitefish			
Tissue		Myomere		Liver		Myomere		Liver	
Number		Mean	se	Mean	se	Mean	se	Mean	se
Length (mm)		529	25.1			383	4.9		
Weight (g)		1789	229.8			733	26.6		
Age (yr)		22	1.3			22	1.3		
Moisture	%	79.3	0.22	77.6	0.77	79.9	0.20	79.1	0.53
Aluminum	T-Al	<5		7.45	1.432	<5		5.39	0.889
Arsenic	T-As	0.030	0.0027	0.047	0.0050	0.026	0.0016	0.049	0.0044
Barium	T-Ba	<0.5		<0.5		<0.5		<0.5	
Beryllium	T-Be	<0.2		<0.2		<0.2		<0.2	
Cadmium	T-Cd	<0.02		0.031	0.0050	<0.02		0.088	0.0110
Calcium	T-Ca	99.6	7.63	71.2	2.91	171.2	21.17	74.5	13.59
Chromium	T-Cr	<0.5		<0.5		<0.5		<0.5	
Cobalt	T-Co	<0.5		<0.5		<0.5		<0.5	
Copper	T-Cu	<0.5		12.21	1.650	<0.5		4.69	0.622
Iron	T-Fe	2.52	0.178	274.76	37.214	2.52	0.340	173.00	40.533
Lead	T-Pb	<0.05		<0.05		<0.05		0.058	0.0054
Magnesium	T-Mg	255.4	2.75	126.3	4.97	252.4	6.05	148.0	6.37
Manganese	T-Mn	<0.2		1.171	0.0718	0.129	0.0292	1.752	0.2108
Mercury	T-Hg	0.307	0.0155	0.363	0.0245	0.084	0.0244	0.251	0.0610
Molybdenum	T-Mo	<1		<1		<1		<1	
Nickel	T-Ni	<1		<1		<1		<1	
Selenium	T-Se	0.20	5.1E-10	1.062	0.0715	0.262	0.0267	1.243	0.1479
Silver	T-Ag	<0.1		0.136	0.0193	<0.1		<0.1	
Zinc	T-Zn	2.63	0.054	27.29	1.520	2.51	0.076	23.78	1.411

3.2.5 Mercury

Mercury in various forms occurs naturally in the environment. However, Precambrian Shield lakes are known to have higher concentrations of mercury (Cameron and Jonasson, 1972) and land disturbances can lead to further increases. The Hope Bay Belts lies on the northern edge of the Slave Geological Province of the Precambrian shield.

In the natural environment, mercury bioaccumulates in fish tissues, and, through the process of biomagnification, is typically found to have higher concentrations in

older, piscivorous fishes. Methylmercury (formed by the bacterial methylation of inorganic mercury) accounts for greater than 70% of the total tissue load of mercury (Grey *et al.*, 1995). There are documented health hazards with respect to mercury consumption. The Health Canada guideline for the maximum allowable level of mercury in myomere tissue of commercially marketed fishes is 0.5 ppm. The recommended guideline for frequent consumption is 0.2 ppm.

Mercury was detected in all tissue samples. The relationship between mercury concentration and the age and fork length of fishes was examined using linear regression analysis. Although in most cases a regression of the mercury concentration against each of age and fork length resulted in a strong relationship, age and fork length had to be treated separately. Multivariate analysis, such as multiple regression, did not provide more significant results. This is because age and fork length are at least partially related, thus confounding the results.

3.2.5.1 Lake Trout

Myomere: Age and Fork Length

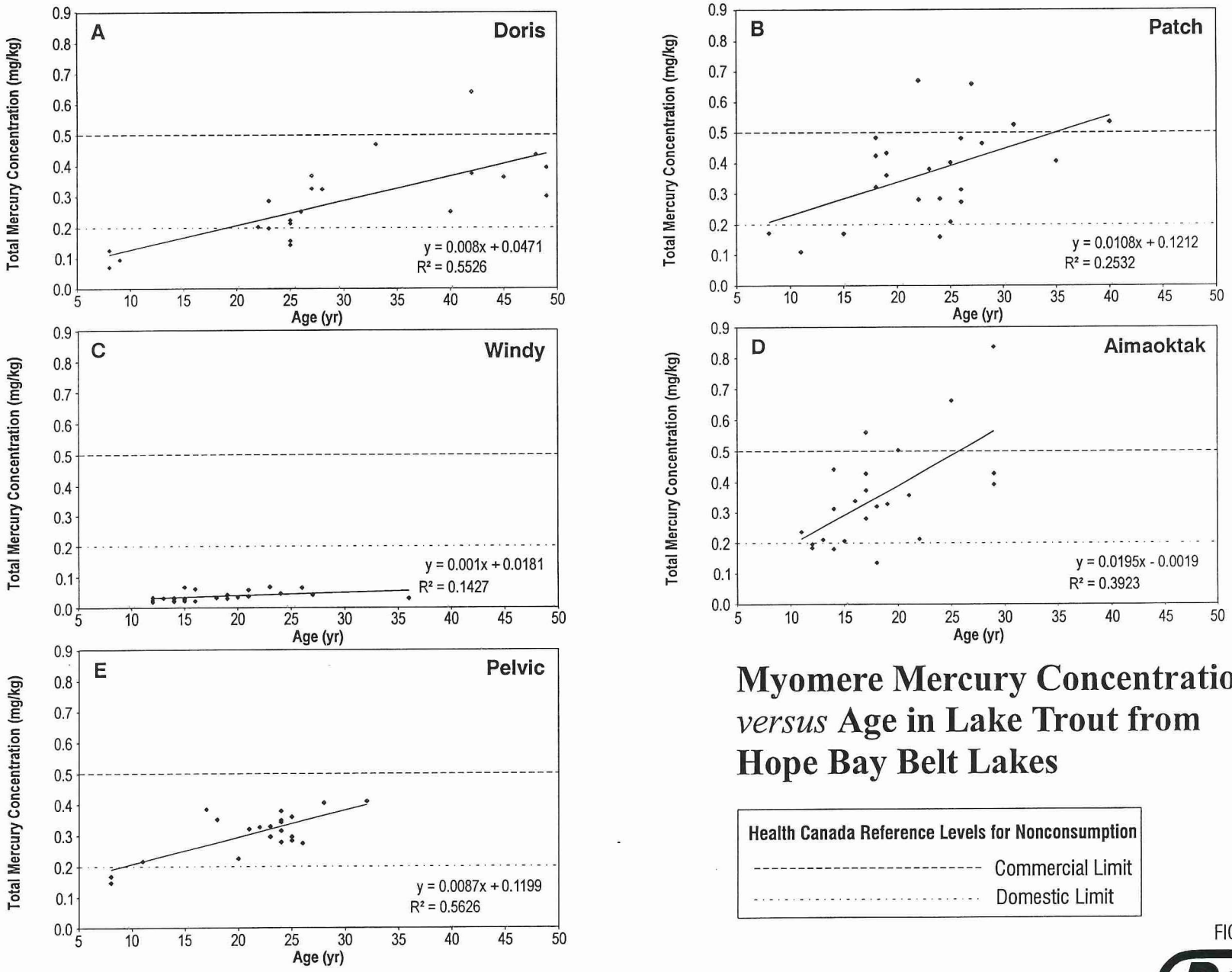
Figure 3-1 presents the regressions of total mercury concentration in lake trout myomere against age. As the R^2-values show, strong correlations were found for Pelvic and Doris trout (R^2= 0.5626 and 0.5526, respectively). A weak correlation was found for Aimaoktak and Patch trout (R^2= 0.3923 and 0.2532, respectively). There was essentially no correlation for Windy trout (R^2= 0.1427). The relationship among lakes was therefore:

(a) LKTR Mean T-Hg (MY) vs. Age: Pelvic>Doris>Aimoaktak>Patch>Windy

with:

(b) LKTR Mean T-Hg (MY): Patch>Aimoaktak>Pelvic>Doris>Windy

(c) LKTR Mean Age: Doris>Patch>Pelvic>Aimoaktak=Windy



Myomere Mercury Concentrations *versus* Age in Lake Trout from Hope Bay Belt Lakes

Health Canada Reference Levels for Nonconsumption

- Commercial Limit
- Domestic Limit

FIGURE 3-1

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The regression of mean total mercury against fork length generally resulted in correlations (Figure 3-2). There were strong correlations for Doris and Aimoaktak trout (R^2= 0.5222 and 0.5010, respectively), a fair correlation for Patch (R^2= 0.4283), and a weak correlation for Pelvic (R^2= 0.3233). However, there was no correlation for Windy trout (R^2= 0.0323). The fork length relationship among lakes was:

(d) LKTR Mean T-Hg (MY) vs. FL: Doris>Aimoaktak>Patch>Doris>Windy

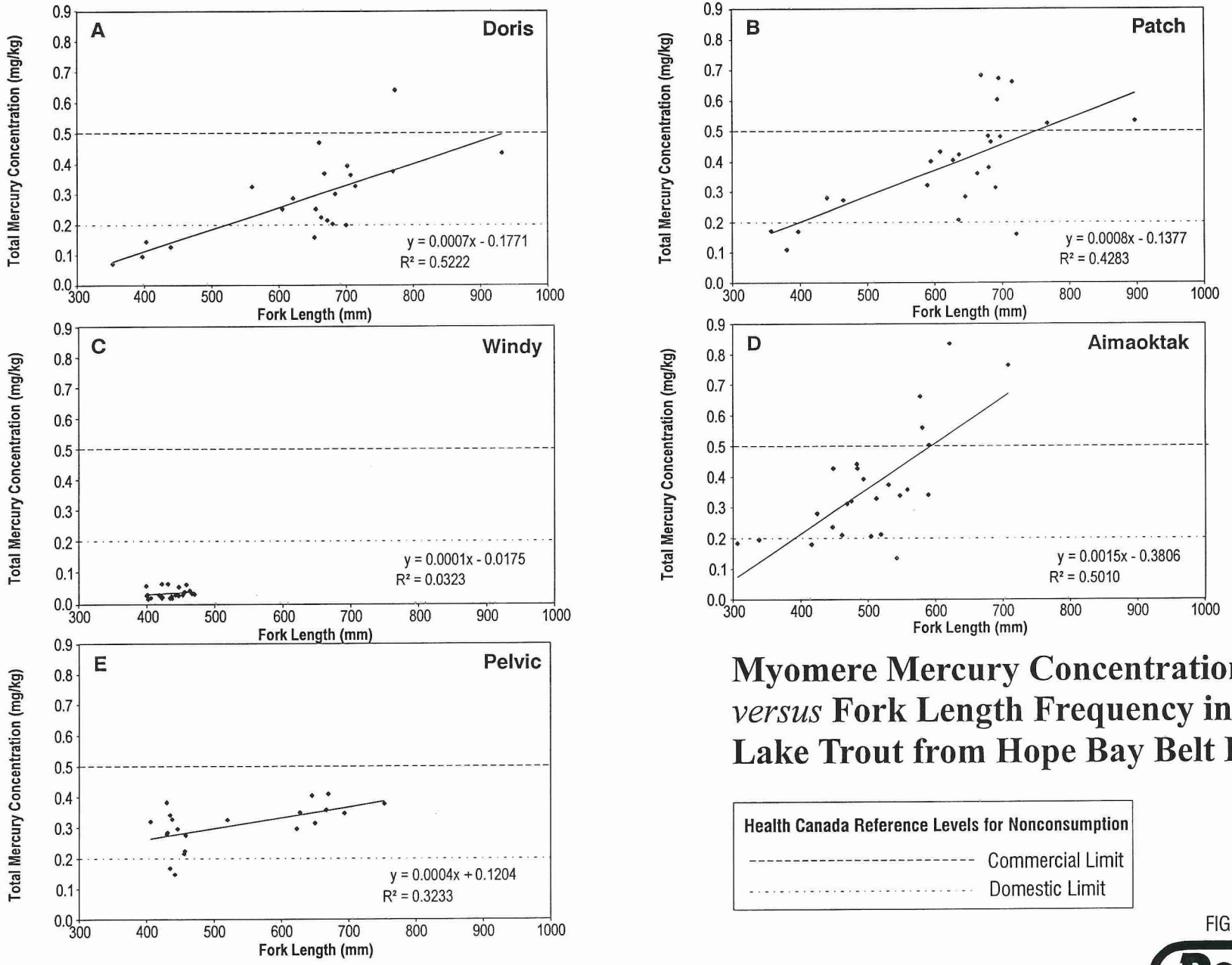
with:

(e) LKTR Mean Fork Length: Doris>Patch>Pelvic>Aimoaktak>Windy

Differences in results are likely due to differences in the trophic cascade in the lakes as well as the trout population responses to local conditions. Some of these factors may include:

- the bioavailability of mercury in sediments;
- the bioavailability of mercury in forage fishes; and
- the presence and density of forage fishes. In addition, differences in the mean size and age of sampled fish among lakes may also account for some of the variance. This is because larger fish occupy a higher trophic status and consequently have a greater proportion of their diet consisting of fish.

Pelvic and Doris lakes had the densest populations of forage species; lake cisco (*Coregonus artedi*) and lake whitefish (Rescan, 1998, 1999). Aimaoktak and Patch lakes had lower densities of forage species, and Windy Lake had no forage species (Rescan, 1998, 1999). When forage species are present, trout will switch to a piscivorous diet earlier in their lifecycle (Welch and Klings, 1996). Therefore, the more dense the forage base, the greater the exposure of trout to mercury, and the greater the potential for mercury to bioaccumulate and biomagnify. This is borne out by the Windy Lake results. The small, relatively old trout feed mostly on invertebrates and therefore have a mean total mercury concentration that is low, even less than those observed in the lake whitefish samples (Table 3-4).



Myomere Mercury Concentrations *versus* Fork Length Frequency in Lake Trout from Hope Bay Belt Lakes

FIGURE 3-2

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Coupled with the presence of forage fish as a factor in the differences in myomere concentrations, is the mean total mercury present in the forage species. The relationship among lakes of total mean mercury in lake whitefish myomere was:

(f) LKWH Mean T-Hg (MY): Aimoaktak>Patch>Pelvic>Doris>Windy

This follows closely the relationship observed among lakes for total mean mercury in lake trout (a). Therefore, the mean total concentration of mercury in lake trout myomere is likely related to:

- the availability of forage fish;
- the mean total concentration of mercury in forage fish myomere; and
- the bioavailability of mercury to the forage fishes.

Liver: Age and Fork Length

As Figure 3-3 shows, the regressions of total mercury concentration in lake trout liver against age had generally strong correlations. The R^2-values indicate a very strong correlation for Pelvic (R^2= 0.7175) and strong correlations for Aimoaktak, Doris, and Patch trout (R^2= 0.5144, 0.4862, and 0.4084, respectively). There was essentially no correlation for Windy trout (R^2= 0.1165). The relationship among lakes is:

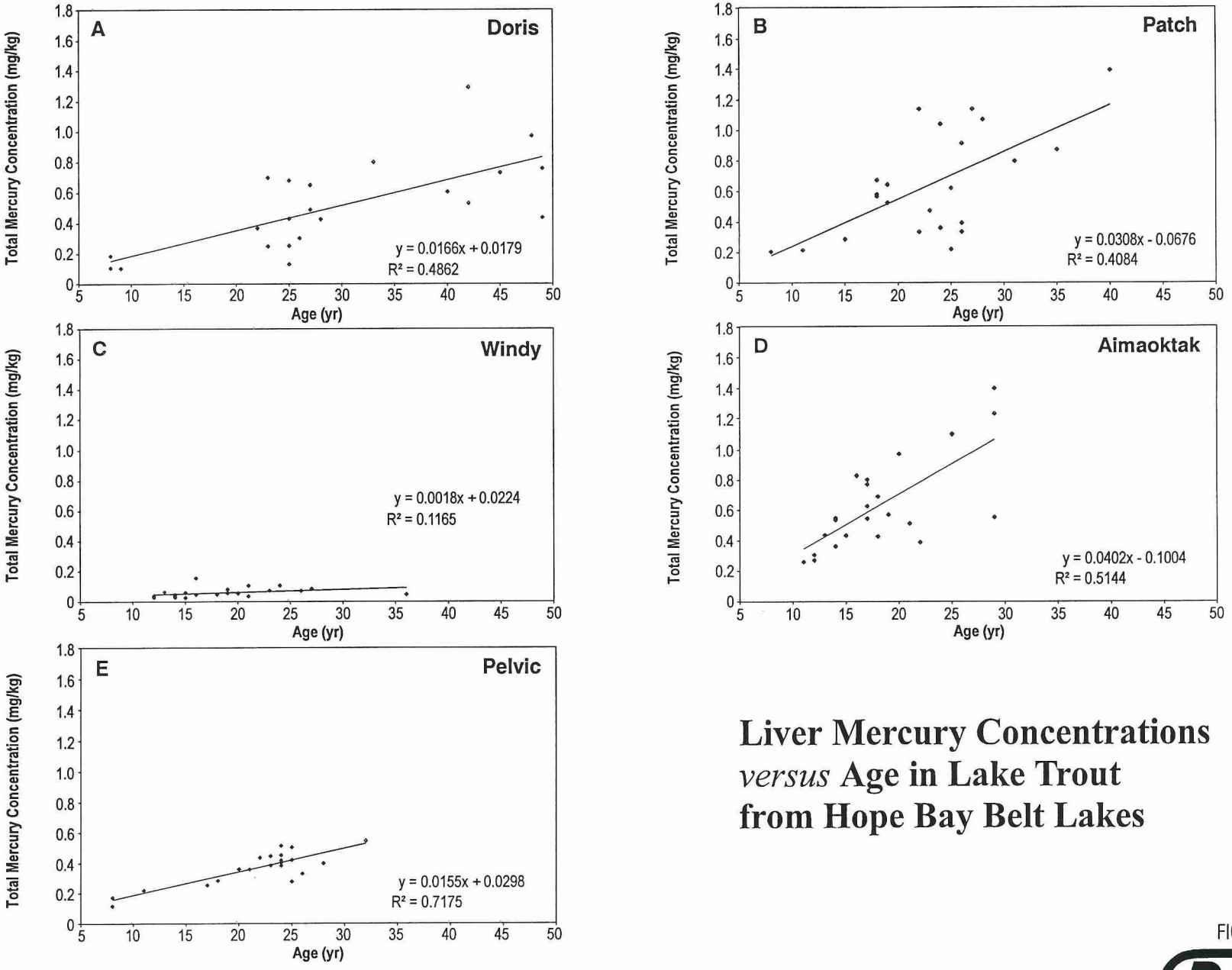
(g) LKTR Mean T-Hg (LV) vs. Age: Pelvic>Aimoaktak>Doris>Patch>Windy

The regression of mean total mercury against fork length generally resulted in strong correlations for Doris, Patch, and Aimoaktak trout (R^2= 0.5460, 0.5389, and 0.4106, respectively; Figure 3-4). There were weak to no correlations for Pelvic and Windy trout (R^2= 0.1814 and 0.0151, respectively). The relationship among lakes is:

(h) LKTR Mean T-Hg (LV) vs. FL: Doris>Patch>Aimoaktak>Pelvic>Windy

The difference in results are likely due to the same factors listed for myomere (Section 3.2.6.1.1). These are:

- the bioavailability of mercury in sediments;
- the bioavailability of mercury in forage fishes;



Liver Mercury Concentrations *versus* Age in Lake Trout from Hope Bay Belt Lakes

FIGURE 3-3

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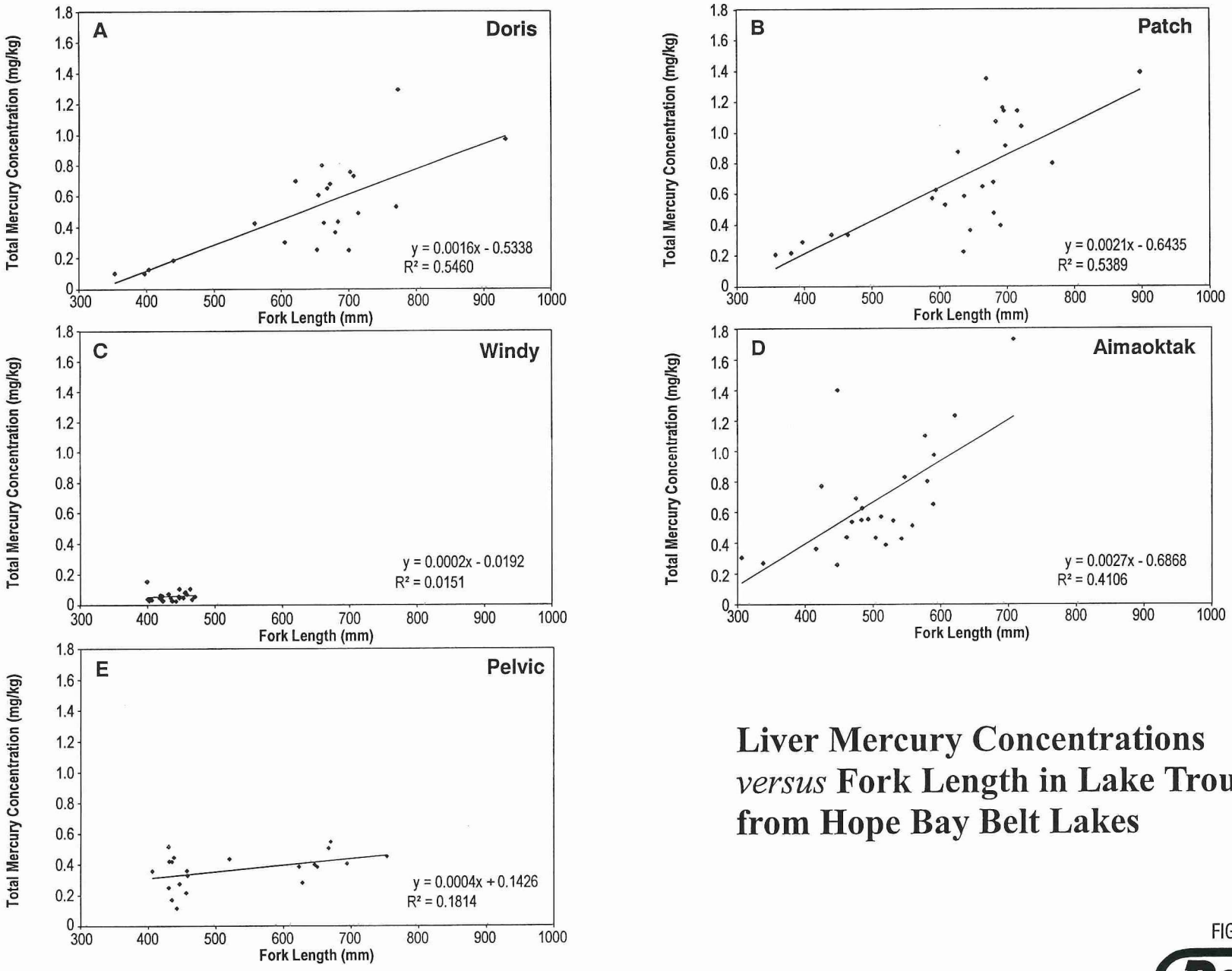

Liver Mercury Concentrations *versus* Fork Length in Lake Trout from Hope Bay Belt Lakes

FIGURE 3-4

BHP

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- the presence and density of forage fishes; and
- the mean size of the sampled fishes.

Another factor to consider is the function of the liver in detoxification. The liver is the site of metal-binding by proteins such as metallothionines (Jimenez and Stegeman, 1990). Therefore, higher liver concentrations of mercury are likely the result of binding and detoxification processes.

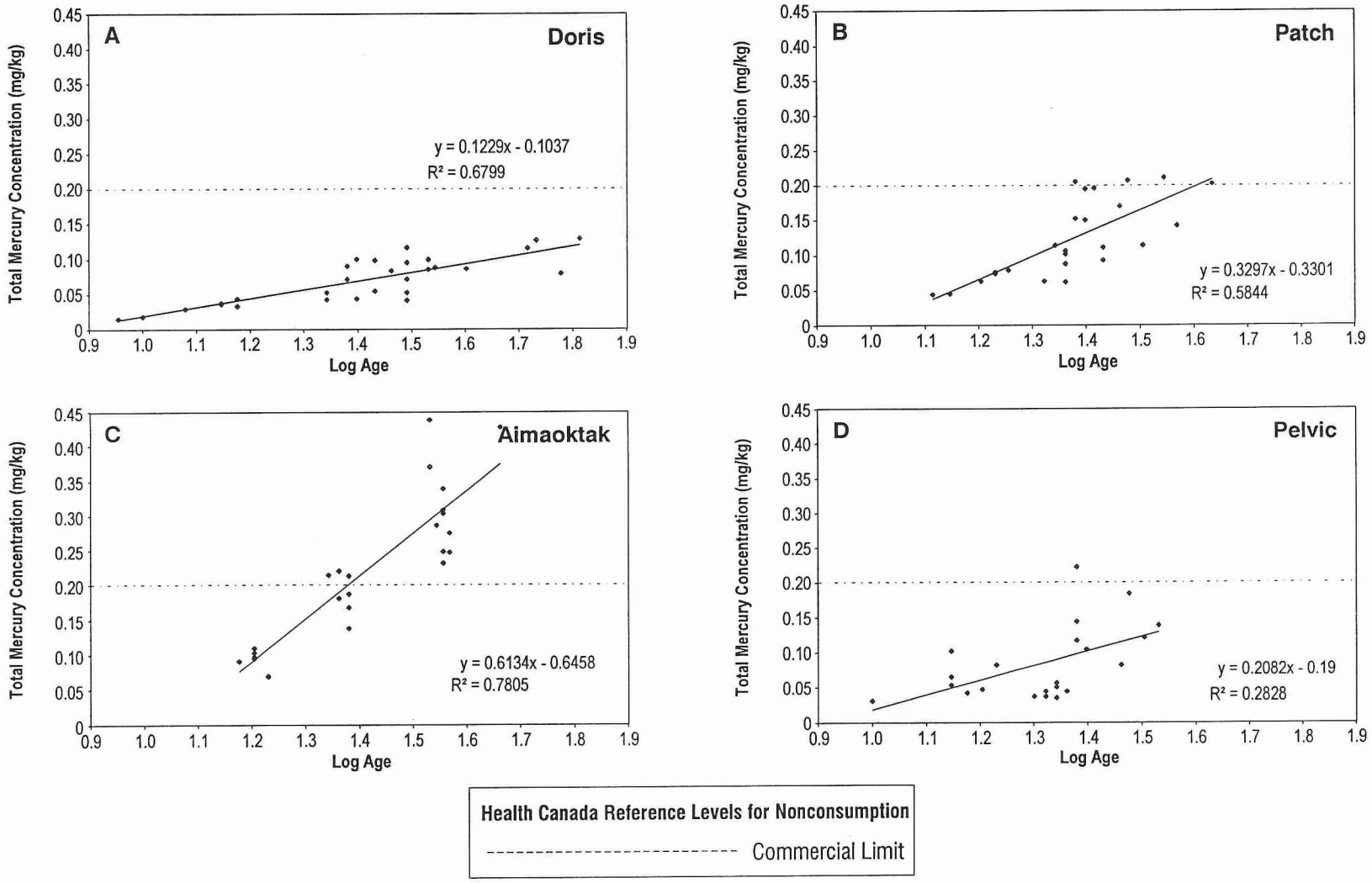
Again, the Windy tissue results appear to support this hypothesis. Liver mercury concentrations in Windy trout were less than those in all other samples, including lake whitefish. This indicates that Windy trout were probably exposed to lower levels of mercury than fishes in other lakes, trout and whitefish included. The differences between Windy trout mercury concentrations and trout and whitefish from other lakes is likely due to differences in diet. Windy trout are small and feed primarily on invertebrates. Trout in the other lakes include more fish in their diets and therefore are exposed to higher concentrations of mercury in their diets.

Differences in diet likely also accounted for the lower observed mercury concentrations in Windy trout than lake whitefish from other lakes. Whitefish feed primarily on benthos whereas lake trout usually include both benthic invertebrates as well as pelagic invertebrates in their diets. As mercury enters the food chain primarily through the benthos, the greater proportion of pelagic invertebrates in the Windy trout diet results in a lower exposure rate of Windy trout to mercury and thus lower mercury concentrations than whitefish from other lakes.

3.2.5.2 Lake Whitefish

Myomere: Age and Fork Length

Figure 3-5 presents the regressions of total mercury concentration in lake whitefish myomere against log age. Strong correlations were found for Aimoaktak, Doris, and Patch whitefish (R^2= 0.7805, 0.6799, and 0.5844, respectively). A weak correlation was found for Pelvic whitefish (R^2= 0.2828). The relationship among lakes was therefore:



Myomere Mercury Concentrations *versus* Age in Lake Whitefish from Hope Bay Belt Lakes

FIGURE 3-5

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(i) LKWH Mean T-Hg (MY) vs. Age: Aimoaktak>Doris>Patch>Pelvic

with:

(j) LKWH Mean T-Hg (MY): Aimoaktak>Patch>Pelvic>Doris

(k) LKWH Mean Age: Aimoaktak>Doris>Patch>Pelvic

The regression of mean total mercury against log fork length resulted in strong to weak correlations (Figure 3-6). There were strong correlations for Doris, Aimoaktak, and Patch whitefish (R^2= 0.6898, 0.5768, and 0.4574, respectively) and a weak correlation for Pelvic whitefish (R^2= 0.3047). The fork length relationships among lakes was:

(l) LKWH Mean T-Hg (MY) vs. FL: Doris>Aimoaktak>Patch>Pelvic

with:

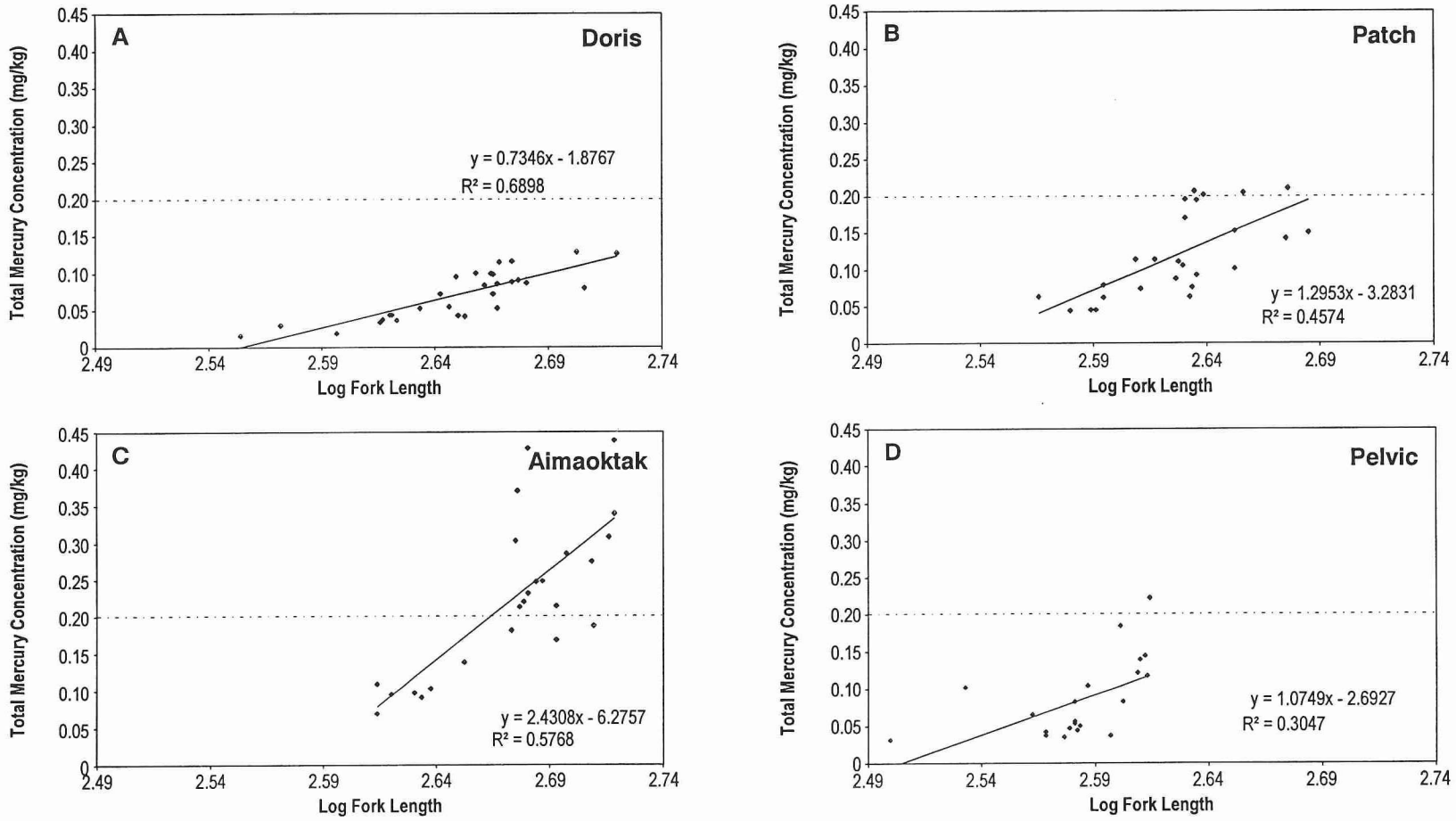
(m) LKWH Mean Fork Length: Aimoaktak>Doris>Patch>Pelvic

The difference in results is likely due to the differences in the trophic cascade in the lakes as well as differences in the size and age of the sampled fish from each lake. The progression of mean fork length of lake samples shown in (m) is similar to the progression for mean ages (k) and the regressions of total mercury against fork length (l). This indicates that as the mean size of the samples decreased, so did the strength of the regressions. This is likely due to the smaller mean samples being comprised of younger fish of a narrower size and age range (Tables 3-2 to 3-6). As such, the narrow ranges in age and size naturally led to weaker correlations.

Liver: Age and Fork Length

The regressions of total mercury concentration in lake whitefish liver against log age had generally strong correlations (Figure 3-7). The R^2-values indicate strong correlations for Doris, Pelvic, and Patch whitefish (R^2= 0.6109, 0.5373, and 0.4711, respectively). There was a weak correlation for Aimoaktak fish (R^2= 0.3817). The relationship among lakes is:

(n) LKWH Mean T-Hg (LV) vs. Log Age: Doris>Pelvic>Patch>Aimoaktak



Myomere Mercury Concentrations *versus* Fork Length in Lake Whitefish from Hope Bay Belt Lakes

FIGURE 3-6

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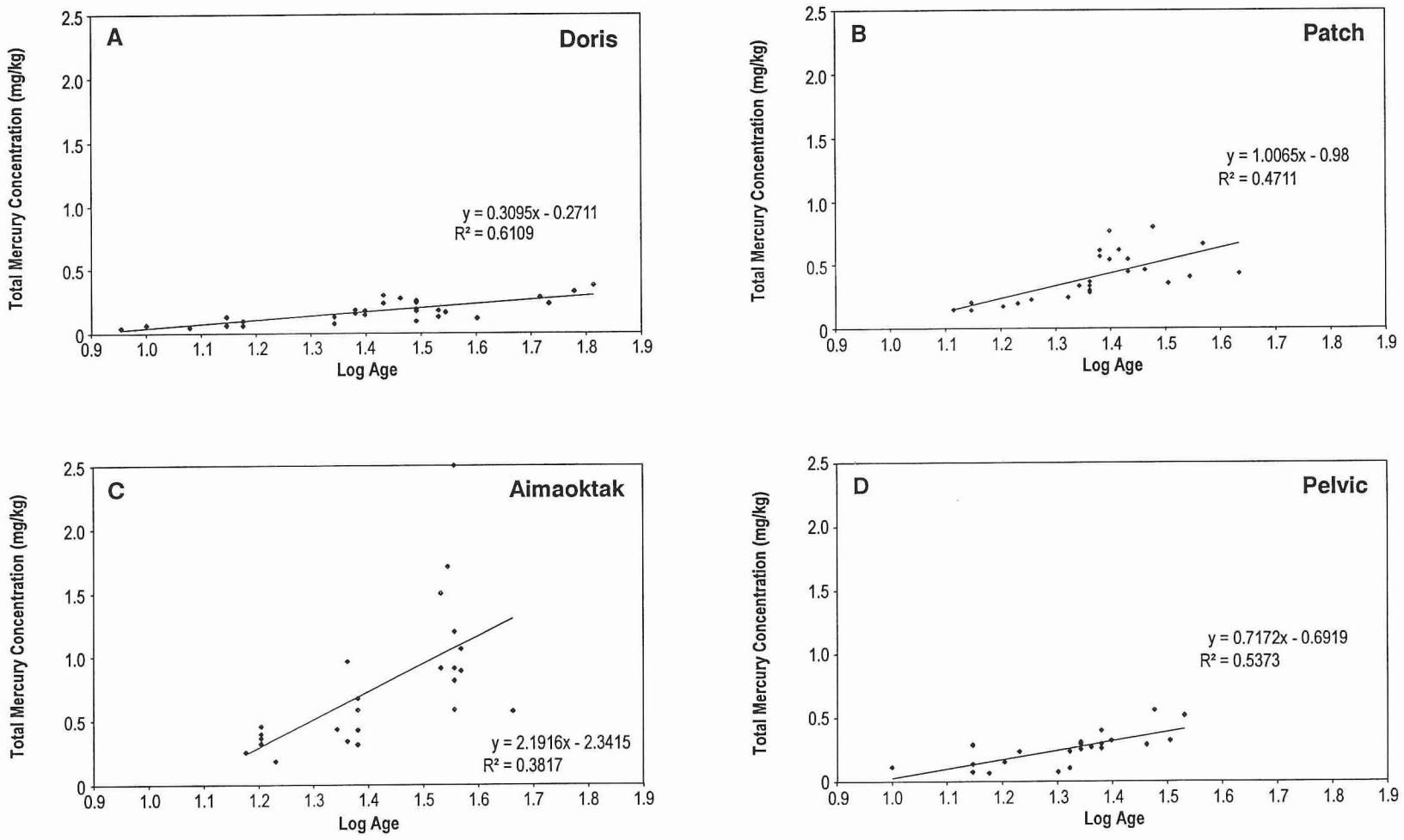

Liver Mercury Concentrations *versus* Age in Lake Whitefish from Hope Bay Belt Lakes

FIGURE 3-7

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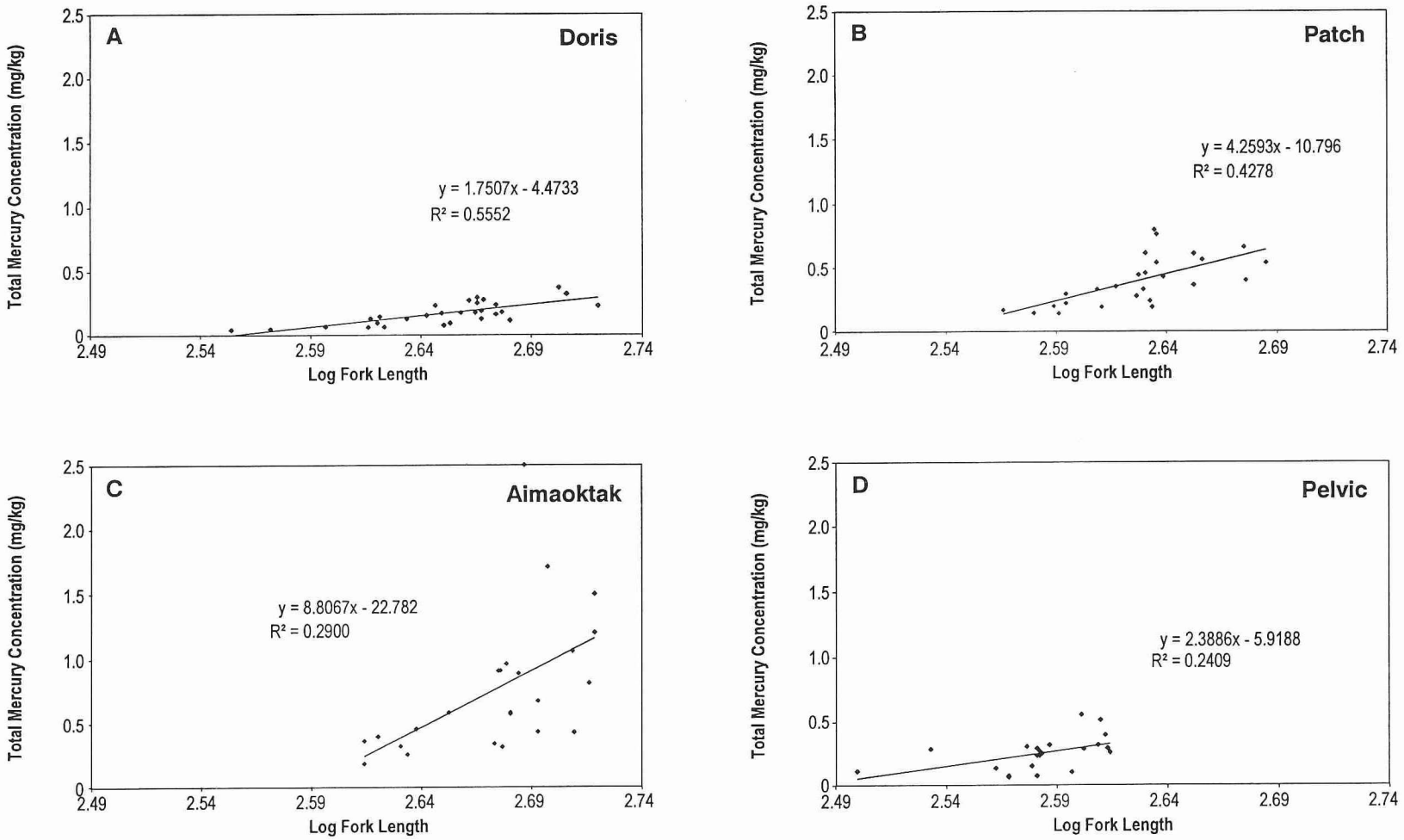

Liver Mercury Concentrations *versus* Fork Length in Lake Whitefish from Hope Bay Belt Lakes

FIGURE 3-8

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The regressions of mean total mercury against log fork length were less significant than those for log age (Figure 3-8). Correlations were strong for Doris and Patch whitefish (R^2= 0.5552 and 0.4278, respectively), but weak for Aimoaktak and Pelvic fish (R^2= 0.2900 and 0.2409, respectively). The relationship among lakes was:

(o) LKWH Mean T-Hg (LV) vs. log FL: Doris>Patch>Aimoaktak>Pelvic

The difference in results are likely due to the same factors listed for myomere (Section 3.2.6.2, above). In addition, acute exposures of individual fish from recent meals containing high levels of mercury, may also have added variance to the results.

3.3 Conclusions

All metals levels in fish, with the exception of mercury, were measured in concentrations below the Health Canada guidelines. There were no development activities in the vicinity of the source lakes which could have contributed to the observed metal concentrations. Therefore, the metal levels observed in the Hope Bay Belt fishes can be considered as normal background concentrations.

Tissue concentrations of mercury were greater in liver samples than in myomere samples. The mean tissue concentrations of total mercury in lake trout tissues were greater than those of lake whitefish from the same lake. A total of 12 out of 118 lake trout sampled were found to have myomere mercury concentrations above the Health Canada guideline (0.5 ppm; Table 3-7). Additionally, thirty-six fish were found to have mercury concentrations above 0.3 ppm. More than half the trout from Patch and Aimoaktak lakes had myomere mercury concentrations above 0.3 ppm (68% and 60%, respectively; Table 3-7). In contrast, the mean Windy lake trout myomere mercury concentration was the lowest, less than all other trout and whitefish sampled from the other lakes (Tables 3-3 to 3-7).

Generally, older, larger trout had greater concentrations of mercury in their tissues (Figures 3-1 to 3-4). The larger, older lake trout were also more likely to have a myomere mercury concentration above the Health Canada guideline for consumption (0.5 ppm). As there is no development linked with these results, it can be concluded that background mercury concentrations in larger, older lake trout typically exceed the Health Canada guideline.

Table 3-7
Number of Fishes by Total Mercury Concentration in Myomere Tissues from Hope Bay Belt Lakes, 1997 and 1998

	LKTR				LKWH			
T-Mercury (ppm)	<0.3	0.3- 0.4	>0.5	n	<0.3	0.3- 0.4	>0.5	n
Doris	15	6	1	**22**	29	0	0	**29**
Patch	8	11	6	**25**	26	0	0	**26**
Windy	25	0	0	**25**	-	-	-	-
Aimaoktak	10	10	5	**25**	19	5	0	**24**
Pelvic	12	9	0	**21**	22	0	0	**22**
TOTAL	**70**	**36**	**12**	**118**	**96**	**5**	**0**	**101**

Lake whitefish mean tissue concentrations of mercury tended to be lower than those of lake trout (Table 3-2 to 3-6). Only five out of the 101 whitefish sampled had myomere mercury concentrations above 0.3 ppm and none over 0.5 ppm (Table 3-7). The fish with the highest myomere mercury concentrations were from Aimoaktak Lake.

References

REFERENCES

Cameron, E.M., and I.R. Jonasson. 1972. Mercury in Precambrian shales of the Canadian Shield. *Geochim. Cosmochim. Acta.* 36: 985-1005.

Demayo, A., M.C. Taylor, and K.W. Taylor. 1982. Effects of copper on humans, laboratory and farm animals, and terrestrial plants and aquatic life. *CRC Critical Reviews in Environmental Control.* 12(3): 183-255.

Falk, M.R., M.D. Miller, and S.J.M. Kostuik. 1973. Biological effects of mining wastes in the Northwest Territories. *Fish. Mar. Serv. Tech. Rep.* CEN/T-73-10. 29pp.

Grey, B.J., S.M. Harbicht, and G.R. Stephens. 1995. Mercury in fish from rivers and lakes in Southwestern Northwest Territories. *Indian and Northern Affairs Canada, Northern Affairs Program, Northern Water Resources Studies*. Yellowknife, NT.

Harbicht, S., and G.R. Ash. 1991. *Fisheries investigations at the Lupin Gold Mine, Contwoyto Lake, N.W.T., 1990.* Report prepared for Echo Bay Mines. R.L.&L. Environmental Services Ltd. in association with Fisheries and Oceans Canada. Edmonton, Alberta.

Jimenez, B.D., and J.J. Stegeman. 1990. *Detoxification enzymes as indicators of environmental stress in fishes.* American Fisheries Society Symposium 8:67-79.

Rescan. 1999. *Hope Bay Belt Project: 1998 Environmental Data Report.* Report prepared for BHP Diamonds Inc. Rescan Environmental Services Ltd. Yellowknife, NT.

Rescan. 1998. *Hope Bay Belt Project: 1997 Environmental Data Report.* Report prepared for BHP World Minerals. Rescan Environmental Services Ltd. Yellowknife, NT.

Sprague, J.B. 1987. Effects of cadmium on freshwater fishes. *In* J.O. Nriagu, and J.B. Sprague (eds.) Cadmium in the Aquatic Environment. *Adv. Env. Sci. Tech.* 19: 139-169.

Spry, D.J., and J.G. Wiener. 1991. Metal bioavailability and toxicity to fish in low-alkalinity lakes: a critical review. *Env. Poll.* 71:243-304.

Swyripa, M.W., C.A. LaFontaine, and M.C. Paris. 1993. *Water and fish quality from Trout Lake, N.W.T. 1990-91.* Water Resources Division, Department of Indian Affairs and Northern Development, Yellowknife, NT.

Welch, H.E., and H. Klings. 1996. *Limarctic: Arctic Freshwater Ecology.* CD-ROM version. The Centre for Earth Observation Science (CEOS), Dept. of Geography, University of Manitoba, Winnipeg.

Windom, H., R. Stickney, R. Smith, D. White, and F. Taylor. 1973. Arsenic, cadmium, copper, mercury, and zinc in some species of North Atlantic finfish. *J. Fish. Res. Board Can.* 30:275-279.

Appendix 3-1
Key to Abbreviations and Codes

Appendix 3-1
Key to Abbreviations and Codes

FISH NAMES AND CODES

Code	Common Name	Binomial
LKTR	lake trout	*Salvelinus namaycush*
LKWH	lake whitefish	*Coregonus clupeaformis*

DATA CODES

Tissue Sample	
Liver	LV
Myomere	MY

Appendix 3-2a
Concentrations of Metals in Lake Trout Myomere from Doris Lake, 1997

Appendix 3-2a
Concentrations of Metals in Lake Trout Myomere from Doris Lake, 1997

Fish	#169	#182	#194	#195	#255	#256	#272	#289	#303	#304	#323
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	439	684	700	663	605	702	655	353	672	403	680
Weight (g)	790	3225	3300	2925	2025	2325	2625	406	2600	756	3050
Age (yr)	8	49	23	25	26	49	40	8	25	25	22
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	77.4	80.4	80.3	80.5	79.2	84.2	81.4	80.2	79	81	79.6
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	0.1	0.05	0.07	<0.05	0.07	0.06	<0.05	0.05	<0.05	0.08
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	147	97	73	141	95	141	120	345	67	82	134
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	3	1	2	3	3	2	2	2	4	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	273	229	233	233	241	192	225	271	246	250	237
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.126	0.3	0.198	0.224	0.252	0.394	0.251	0.071	0.214	0.143	0.203
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	3.2	2.9	3	2.8	3.1	2.8	2.8	3.4	2.7	2.6	2.9

(continued)

Appendix 3-2a
Concentrations of Metals in Lake Trout Myomere from Doris Lake, 1997

Fish	#324	#342	#343	#344	#362	#365	#476	#477	#521	#530	#531
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	560	653	714	707	397	932	621	660	668	770	773
Weight (g)	1940	2700	3275	3175	582	9900	2350	2020	2950	3844	4221
Age (yr)	28	25	27	45	9	48	23	33	27	42	42
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	79.6	79.1	79	81.2	78.9	76.6	78.3	84.1	79.1	80.7	81
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	0.06	0.08	0.08	<0.05	<0.05	<0.05	0.06	0.11	0.09	0.09
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	146	65	117	130	105	69	64	198	72	283	109
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	2	3	2	2	2	2	2	2	2	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	245	241	249	209	262	195	238	198	253	234	235
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.324	0.157	0.326	0.363	0.095	0.435	0.286	0.47	0.368	0.375	0.641
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.7	2.8	2.9	2.5	3.1	3.1	2.7	2.7	2.8	3	2.8

(completed)

Appendix 3-2b
Concentrations of Metals in Lake Trout Livers from Doris Lake, 1997

Rescan

Appendix 3-2b
Concentrations of Metals in Lake Trout Livers from Doris Lake, 1997

Fish	#169	#182	#194	#195	#255	#256	#272	#289	#303	#304	#323
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	439	684	700	663	605	702	655	353	672	403	680
Weight (g)	790	3225	3300	2925	2025	2325	2625	406	2600	756	3050
Age (yr)	8	49	23	25	26	49	40	8	25	25	22
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	73.5	81.6	80	79	79.6	83.5	77.6	-	78	80.6	78
Aluminum T-Al	<5	10	<5	<5	<5	<5	<5	<5	7	12	<5
Arsenic T-As	0.08	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.02	0.04	<0.02	0.03	0.04	0.03	0.03	<0.02	0.02	<0.02	<0.02
Calcium T-Ca	51	52	65	63	48	67	62	110	71	68	51
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	11.7	10.1	8.7	17.1	12.3	19	12.9	7.1	18.6	28	10.3
Iron T-Fe	186	310	118	215	285	513	636	84	90	104	161
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	166	119	122	130	114	98	133	165	117	135	133
Manganese T-Mn	1.4	1.1	1.1	1.3	0.9	0.8	1.2	1.7	1	1.4	1.3
Mercury T-Hg	0.184	0.433	0.248	0.427	0.301	0.755	0.604	0.104	0.678	0.128	0.365
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.1	0.9	0.9	1.4	1.1	1.3	1.1	1	0.8	1	1.3
Silver T-Ag	0.2	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.1	0.2	0.1	0.1
Zinc T-Zn	35	25	28.8	34.1	25.8	25.9	29.3	38	29.8	36.4	30.4

(continued)

Appendix 3-2b
Concentrations of Metals in Lake Trout Livers from Doris Lake, 1997

Fish	#324	#342	#343	#344	#362	#365	#476	#477	#521	#530	#531
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	560	653	714	707	397	932	621	660	668	770	773
Weight (g)	1940	2700	3275	3175	582	9900	2350	2020	2950	3844	4221
Age (yr)	28	25	27	45	9	48	23	33	27	42	42
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	80.8	78.3	79.4	72.4	76	77	79.3	82.2	78.5	78.8	79.3
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	0.05	0.09	<0.05	<0.05	0.08	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.03	0.03	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.02	<0.02
Calcium T-Ca	82	58	64	60	69	56	53	54	65	70	52
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	3.4	8.2	15	16.8	9	5.1	8.6	13.1	17.7	18.8	17.6
Iron T-Fe	250	189	139	192	198	44	289	165	152	262	208
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	175	119	125	129	157	125	122	121	130	125	122
Manganese T-Mn	1.7	1	1.4	1.1	1.6	1.4	1	1.4	1.1	1.1	1
Mercury T-Hg	0.425	0.251	0.488	0.729	0.102	0.969	0.696	0.799	0.649	0.529	1.29
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.7	0.8	1.6	1.3	1.6	1	1.6	0.7	1	0.8	1.3
Silver T-Ag	<0.1	<0.1	0.1	0.1	<0.1	<0.1	0.1	<0.1	0.2	0.2	0.1
Zinc T-Zn	24.9	27.2	35	26.6	32.2	20.7	26.9	22.6	29.7	31.4	26.5

(completed)

Appendix 3-2c
Concentrations of Metals in Lake Whitefish Myomere from Doris Lake, 1997

Appendix 3-2c
Concentrations of Metals in Lake Whitefish Myomere from Doris Lake, 1997

Fish	#28	#40	#72	#170	#183	#184	#185	#186	#187	#188
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	417	472	455	418	446	525	450	504	462	479
Weight (g)	870	1556	110	996	1320	1925	1268	1775	1666	1674
Age (yr)	15	31	25	25	31	54	31	65	34	40
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	79.4	79.3	79.1	80.8	79.5	80.8	80.3	84.9	80	78.8
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	227	158	198	157	116	155	146	215	156	89
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	2	2	3	2	4	2	4	2	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	261	249	253	249	235	216	236	186	238	240
Manganese T-Mn	<0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.043	0.116	0.1	0.043	0.095	0.126	0.041	0.128	0.099	0.086
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.9	2.5	2.6	2.4	2.7	3.1	2.5	2.3	2.9	2.7

(continued)

Appendix 3-2c
Concentrations of Metals in Lake Whitefish Myomere from Doris Lake, 1997

Fish	#204	#205	#206	#207	#254	#270	#271	#273	#274	#275
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	508	466	395	358	414	472	465	443	463	413
Weight (g)	1975	1346	724	534	888	1486	1244	1090	1248	916
Age (yr)	60	52	10	9	14	35	34	27	31	15
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	80.5	83.2	78.9	78.3	79.3	79.1	80.4	80.1	80.2	80.1
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	81	226	121	139	184	252	152	90	106	172
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	4	4	2	2	2	2	2	3	3	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	225	213	262	273	253	264	229	252	243	250
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	0.2	0.3	<0.2	<0.2	<0.2	0.2
Mercury T-Hg	0.079	0.115	0.018	0.015	0.037	0.088	0.085	0.054	0.071	0.033
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	2.4	3.1	2.9	2.8	2.8	2.5	2.4	2.5	2.5

(continued)

Appendix 3-2c
Concentrations of Metals in Lake Whitefish Myomere from Doris Lake, 1997

Fish	#290	#291	#305	#306	#307	#308	#309	#310	#311
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	459	439	430	465	475	463	420	373	447
Weight (g)	1216	1190	1084	1250	1382	1336	896	638	1360
Age (yr)	29	24	22	31	24	27	14	12	22
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	79.2	76.8	79.8	80.1	80.9	81.7	78.5	79.5	78.4
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	173	211	207	119	98	115	92	160	272
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	3	3	2	2	3	2	2	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	249	234	239	245	240	218	246	244	256
Manganese T-Mn	<0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.2
Mercury T-Hg	0.083	0.071	0.052	0.052	0.09	0.098	0.036	0.029	0.042
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	2.4	2.5	2.4	2.2	2.1	2.7	2.7	3.1

(completed)

Appendix 3-2d
Concentrations of Metals in Lake Whitefish Livers from Doris Lake, 1997

Appendix 3-2d
Concentrations of Metals in Lake Whitefish Livers from Doris Lake, 1997

Fish	#28	#40	#72	#170	#183	#184	#185	#186	#187	#188
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	417	472	455	418	446	525	450	504	462	479
Weight (g)	870	1556	110	996	1320	1925	1268	1775	1666	1674
Age (yr)	15	31	25	25	31	54	31	65	34	40
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	81.3	82.2	82.2	81	80.1	82.9	82.6	80.3	81.1	82
Aluminum T-Al	<5	7	<5	<5	8	13	<5	16	6	<5
Arsenic T-As	<0.05	0.09	0.05	0.13	0.1	0.14	0.06	0.11	0.06	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.03	0.02	<0.02	0.07	<0.02	0.03	0.05	0.07	<0.02	<0.02
Calcium T-Ca	42	46	56	61	51	41	49	46	56	96
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	1.7	5.7	4.5	7.5	5	1.9	3.6	1.5	4.3	7.4
Iron T-Fe	67	90	53	156	67	109	163	220	60	46
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	150	139	124	138	139	131	123	154	157	100
Manganese T-Mn	1.5	2	1.5	2.1	1.9	1.1	1.5	1.4	2.4	1.2
Mercury T-Hg	0.094	0.235	0.172	0.142	0.168	0.225	0.091	0.369	0.174	0.113
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.8	1.1	0.8	1.1	0.9	0.8	0.8	1.3	0.7	0.5
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	20.4	21	18.3	20.9	22.6	19.7	16.2	17.3	21.1	15.5

(continued)

Appendix 3-2d
Concentrations of Metals in Lake Whitefish Livers from Doris Lake, 1997

Fish	#204	#205	#206	#207	#254	#270	#271	#273	#274	#275
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	508	466	395	358	414	472	465	443	463	413
Weight (g)	1975	1346	724	534	888	1486	1244	1090	1248	916
Age (yr)	60	52	10	9	14	35	34	27	31	15
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	79.6	81.4	75.4	-	82.5	82	-	-	79.3	80.8
Aluminum T-Al	7	7	<5	5	6	<5	6	<5	<5	<5
Arsenic T-As	0.12	0.08	0.05	<0.05	0.08	0.07	0.08	0.06	0.07	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.05	0.03	0.04	0.04	0.04	0.04	0.04	0.07	0.05	0.02
Calcium T-Ca	43	66	55	40	62	46	137	61	76	70
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	4	5.4	2.5	2.3	3.5	3.5	3.6	6	3.1	2.1
Iron T-Fe	210	210	117	76	88	101	94	249	144	82
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	137	126	164	167	149	131	153	135	147	136
Manganese T-Mn	1.8	1.6	2.1	2.1	2.6	1.8	2.7	1.6	1.7	1.4
Mercury T-Hg	0.32	0.275	0.063	0.04	0.126	0.16	0.125	0.229	0.249	0.06
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.2	1.3	1.1	0.9	0.7	1	0.8	1.2	1.1	0.9
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	20.1	18.6	26	24.6	18.7	19.2	19.4	25.3	19.6	18.7

(continued)

Appendix 3-2d
Concentrations of Metals in Lake Whitefish Livers from Doris Lake, 1997

Fish	#290	#291	#305	#306	#307	#308	#309	#310	#311
Lake	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris	Doris
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	459	439	430	465	475	463	420	373	447
Weight (g)	1216	1190	1084	1250	1382	1336	896	638	1360
Age (yr)	29	24	22	31	24	27	14	12	22
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	79.7	81.1	79.4	78.7	81.3	80.2	80	-	77.4
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.19	0.06	0.08	0.19	0.09	0.1	0.09	0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.04	<0.02	0.03	0.1	0.04	0.03	<0.02	0.02	0.04
Calcium T-Ca	213	65	58	312	49	66	55	655	45
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	4.4	2.7	5.9	5.8	3.7	7.8	3	1.6	1.6
Iron T-Fe	218	74	112	159	160	125	122	85	68
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	136	143	145	143	128	139	147	146	192
Manganese T-Mn	1.8	1.5	1.8	2	1.8	2	2.3	1.7	2.3
Mercury T-Hg	0.269	0.152	0.125	0.185	0.179	0.291	0.062	0.046	0.074
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.5	1	1.1	1.4	1.1	1.4	0.9	0.7	0.9
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	25	21.8	22.3	26	19.8	22.4	20.9	19.6	20.2

(completed)

Appendix 3-3a
Concentrations of Metals in Lake Trout Myomere from Patch Lake, 1997

Rescan

Appendix 3-3a
Concentrations of Metals in Lake Trout Myomere from Patch Lake, 1997

Fish	#28	#60	#61	#74	#75	#78	#79	#89	#90
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	357	683	715	594	690	695	679	721	608
Weight (g)	418	2608	3198	1740	3242	2230	2833	3516	2032
Age (yr)	8	28	27	25	26	22	18	24	19
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	77.2	80.2	80.4	78.4	79.3	84	77.3	79.3	79.4
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	0.11	0.12	<0.05	<0.05	0.12	0.08	0.16	0.06
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	114	152	172	220	99	83	120	93	62
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	3	2	3	2	3	2	4	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	280	254	251	254	244	208	275	234	239
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.172	0.465	0.66	0.402	0.314	0.671	0.483	0.16	0.433
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	3.2	2.3	2.4	2.6	2.2	2.5	2.8	3	2.6

(continued)

Appendix 3-3a
Concentrations of Metals in Lake Trout Myomere from Patch Lake, 1997

Fish	#91	#92	#100	#101	#105	#107	#108	#116
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	397	897	635	697	636	589	627	767
Weight (g)	606	7294	2476	2900	2362	1700	2388	4860
Age (yr)	15	40	25	26	18	18	35	31
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	79.7	76.2	79.3	79.4	75.6	78.6	77.1	79.1
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.09	0.07	<0.05	0.15	0.08	<0.05	0.07	0.1
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	323	90	118	79	207	107	225	142
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	2	2	3	2	2	2	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	265	267	238	232	286	268	253	254
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.17	0.534	0.209	0.481	0.424	0.322	0.406	0.525
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	2.4	2.2	2.6	3	2.8	2.7	2.6

(continued)

Appendix 3-3a
Concentrations of Metals in Lake Trout Myomere from Patch Lake, 1997

Fish	#117	#118	#119	#120	#124	#125	#129	#136
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	663	669	693	680	645	380	440	464
Weight (g)	2800	2503	2918	3362	2640	614	948	902
Age (yr)	19	-	-	23	24	11	22	26
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	77.8	79.6	80.4	79.3	78.5	78.4	79.4	82.6
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.1	0.13	0.11	0.1	0.07	<0.05	0.07	0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	114	211	193	129	211	96	263	226
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	3	3	2	2	2	5	4
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	256	241	235	253	268	283	250	212
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.361	0.682	0.603	0.381	0.284	0.11	0.281	0.273
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.7	2.5	2.6	2.8	2.8	2.5	2.6	2.5

(completed)

Appendix 3-3b
Concentrations of Metals in Lake Trout Livers from Patch Lake, 1997

Appendix 3-3b
Concentrations of Metals in Lake Trout Livers from Patch Lake, 1997

Fish	#28	#60	#61	#74	#75	#78	#79	#89	#90
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	357	683	715	594	690	695	679	721	608
Weight (g)	418	2608	3198	1740	3242	2230	2833	3516	2032
Age (yr)	8	28	27	25	26	22	18	24	19
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	79.7	79.5	78.4	81.9	-	76.9	79.1	81.6
Aluminum T-Al	9	<5	<5	<5	10	5	<5	<5	<5
Arsenic T-As	0.15	0.05	0.06	<0.05	<0.05	0.09	0.07	0.08	0.07
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	0.04	0.02	0.04	0.05	0.03	<0.02	<0.02	0.03
Calcium T-Ca	79	62	67	80	72	80	66	58	60
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
Copper T-Cu	5.2	14.4	12.2	9.4	2.3	17.8	11	9.2	12.8
Iron T-Fe	76	517	415	500	233	244	300	163	283
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	166	119	115	116	147	113	117	119	106
Manganese T-Mn	1.9	1.2	1	1.1	1.1	1.1	1.2	1.1	1.3
Mercury T-Hg	0.206	1.07	1.14	0.621	0.392	1.14	0.673	1.04	0.526
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.4	1.6	1.9	1.2	0.6	2.2	2.3	1.3	1.4
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	30.1	30.8	27.5	26.9	22.9	27.6	31.3	24.2	26.4

(continued)

Appendix 3-3b
Concentrations of Metals in Lake Trout Livers from Patch Lake, 1997

Fish	#91	#92	#100	#101	#105	#107	#108	#116	#117
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	397	897	635	697	636	589	627	767	663
Weight (g)	606	7294	2476	2900	2362	1700	2388	4860	2800
Age (yr)	15	40	25	26	18	18	35	31	19
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	78.9	82.9	78.7	73	79.6	82	79	75.9
Aluminum T-Al	35	<5	<5	8	<5	6	<5	<5	<5
Arsenic T-As	0.41	<0.05	<0.05	0.09	0.06	0.05	<0.05	0.06	0.09
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.05	<0.02	<0.02	0.03	<0.02	0.03	0.02	<0.02	<0.02
Calcium T-Ca	98	73	<10	49	52	59	68	44	80
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	32.8	2.6	<0.5	23.3	12.8	18.2	9.5	11.6	10.6
Iron T-Fe	864	46	119	214	135	137	310	119	217
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	130	132	15	124	118	130	110	125	118
Manganese T-Mn	1.9	0.9	<0.2	1.5	1.1	1.4	0.9	1.3	1
Mercury T-Hg	0.287	1.39	0.221	0.911	0.581	0.568	0.869	0.797	0.644
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	2.3	0.9	<0.1	2.6	1.8	1.3	1.4	1.7	1.8
Silver T-Ag	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1
Zinc T-Zn	43.8	20.2	2.2	37.9	29.9	35.1	26.5	26.1	29.9

(continued)

Appendix 3-3b
Concentrations of Metals in Lake Trout Livers from Patch Lake, 1997

Fish	#108	#109	#120	#124	#125	#129	#136
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	669	693	680	645	380	440	464
Weight (g)	2503	2918	3362	2640	614	948	902
Age (yr)	-	-	23	24	11	22	26
Tissue	LV	LV	LV	LV	LV	LV	LV
Moisture %	78.9	77.8	78.6	80.2	-	-	77.9
Aluminum T-Al	5	<5	<5	7	8	39	34
Arsenic T-As	0.07	0.08	0.1	<0.05	0.12	0.21	0.21
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.03	0.03	<0.02	0.02	0.03	0.1	0.1
Calcium T-Ca	55	63	54	62	75	88	73
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	15.7	14.8	9	6.5	10.5	19.2	23.8
Iron T-Fe	651	459	80	142	300	779	1400
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	124	121	126	113	151	110	131
Manganese T-Mn	1	1.2	1.3	1.1	1.7	1.5	1.4
Mercury T-Hg	1.35	1.16	0.474	0.361	0.216	0.334	0.335
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	2	2.1	2.3	1.3	1.2	2.7	1.7
Silver T-Ag	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1
Zinc T-Zn	32	30.1	25.5	26	31.5	32.2	34

(completed)

Appendix 3-3c
Concentrations of Metals in Lake Whitefish Myomere from Patch Lake, 1997

Appendix 3-3c
Concentrations of Metals in Lake Whitefish Myomere from Patch Lake, 1997

Fish	#3	#9	#10	#21	#22	#23	#41	#51	#54
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	406	393	484	388	430	449	380	432	408
Weight (g)	966	910	1674	812	1034	1060	712	890	902
Age (yr)	22	18	25	14	17	23	13	25	17
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	77.9	77.4	80	77.3	77.3	79.5	77.7	80.3	79
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	0.08	0.08	0.05	0.13	0.08	0.07	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	136	120	135	100	162	100	139	219	158
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	2	2	2	2	3	2	3	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	266	268	259	282	301	259	283	257	269
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.114	0.079	0.15	0.045	0.076	0.102	0.044	0.195	0.074
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	2.6	2.4	2.8	2.7	2.6	2.8	2.5	2.7

(continued)

Appendix 3-3c
Concentrations of Metals in Lake Whitefish Myomere from Patch Lake, 1997

Fish	#55	#56	#57	#58	#59	#69	#70	#71	#76
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	426	449	432	427	431	414	453	427	429
Weight (g)	1000	1112	956	1155	1078	942	1226	860	1064
Age (yr)	23	24	27	29	30	32	24	26	21
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	80.4	80.1	80.3	81	80.4	80.8	80.2	79.8	79.7
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.11	0.08	0.12	0.09	0.08	<0.05	0.1	0.08	0.07
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	193	286	193	140	214	203	228	262	136
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	3	4	2	3	2	2	3	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	259	252	255	255	253	240	263	260	256
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.106	0.152	0.093	0.17	0.207	0.114	0.205	0.196	0.063
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.4	2.7	2.2	2.6	2.2	2.3	2.4	2.3	2.3

(continued)

Appendix 3-3c
Concentrations of Metals in Lake Whitefish Myomere from Patch Lake, 1997

Fish	#77	#80	#81	#82	#83	#84	#85	#86
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	473	474	424	435	423	390	368	393
Weight (g)	1216	1538	1088	1162	938	734	592	698
Age (yr)	37	35	27	43	23	14	16	23
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	80.4	81.4	80.1	79.5	78.8	78.5	79	80.5
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.09	<0.05	0.07	0.05	<0.05	0.08	0.06	0.06
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	261	168	299	192	101	169	249	152
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	4	2	2	2	3	2	3	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	256	242	276	252	257	280	283	257
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.142	0.211	0.111	0.202	0.088	0.045	0.063	0.062
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.4	2.1	2.2	2.5	2.6	2.7	2.8	2.4

(completed)

Appendix 3-3d
Concentrations of Metals in Lake Whitefish Livers from Patch Lake, 1997

Rescan

Appendix 3-3d
Concentrations of Metals in Lake Whitefish Livers from Patch Lake, 1997

Fish	#3	#9	#10	#21	#22	#23	#41	#51	#54
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	406	393	484	388	430	449	380	432	408
Weight (g)	966	910	1674	812	1034	1060	712	890	902
Age (yr)	22	18	25	14	17	23	13	25	17
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	78.9	73.7	-	-	-
Aluminum T-Al	6	<5	8	6	<5	<5	<5	6	<5
Arsenic T-As	0.11	0.14	0.39	0.48	0.07	0.41	0.4	0.23	0.06
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.05	0.05	0.03	0.04	<0.02	0.05	0.03	0.06	0.05
Calcium T-Ca	230	69	164	58	51	73	72	60	80
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	3.3	4.4	4.4	4.8	7.4	9.2	4	2.8	3.6
Iron T-Fe	83	92	63	107	138	99	101	188	125
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	172	169	158	165	137	147	169	129	156
Manganese T-Mn	1.9	1.8	2.3	2.2	1.3	1.6	2.1	1.5	1.5
Mercury T-Hg	0.328	0.218	0.538	0.195	0.188	0.362	0.141	0.761	0.19
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.6	1.6	1.7	1.6	1	1.5	1.6	2	1.4
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Zinc T-Zn	26.1	28.4	26.5	32.2	25.3	34.6	28.9	25.9	29

(continued)

Appendix 3-3d
Concentrations of Metals in Lake Whitefish Livers from Patch Lake, 1997

Fish	#55	#56	#57	#58	#59	#69	#70	#71	#76
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	426	449	432	427	431	414	453	427	429
Weight (g)	1000	1112	956	1155	1078	942	1226	860	1064
Age (yr)	23	24	27	29	30	32	24	26	21
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	73.7	-	79.3	-	-	75.2	-	76.6
Aluminum T-Al	9	6	9	8	5	14	10	8	<5
Arsenic T-As	0.31	0.22	0.5	0.18	0.23	0.13	0.23	0.47	0.16
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.08	0.07	0.11	0.04	0.1	0.18	0.04	0.06	0.04
Calcium T-Ca	49	74	104	64	62	415	55	59	72
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	5.2	7.7	4.4	3.2	2.7	2.6	3.6	14.4	6.1
Iron T-Fe	114	347	232	86	126	66	81	102	142
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	139	152	154	138	157	148	151	150	168
Manganese T-Mn	1.5	1.4	2.4	1.4	2	2	1.6	1.4	1.9
Mercury T-Hg	0.329	0.61	0.541	0.456	0.795	0.349	0.563	0.615	0.237
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.4	2	2.3	1.5	2.2	1.3	1.9	1.6	1.5
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1
Zinc T-Zn	24.5	33.9	28.1	23.3	24.6	25	28	36.9	29.8

(continued)

Appendix 3-3d
Concentrations of Metals in Lake Whitefish Livers from Patch Lake, 1997

Fish	#77	#80	#81	#82	#83	#84	#85	#86
Lake	Patch	Patch	Patch	Patch	Patch	Patch	Patch	Patch
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	473	474	424	435	423	390	368	393
Weight (g)	1216	1538	1088	1162	938	734	592	698
Age (yr)	37	35	27	43	23	14	16	23
Tissue	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	82.2	72.3	81.3	75.9	-	-	-
Aluminum T-Al	9	16	8	6	9	9	9	10
Arsenic T-As	0.58	0.11	0.21	0.13	0.14	0.34	0.16	0.31
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.1	0.04	0.06	0.03	0.06	0.04	0.1	0.15
Calcium T-Ca	54	46	64	54	58	64	238	69
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	3.4	2.4	5.6	2.9	2.7	3.6	2.3	2.9
Iron T-Fe	277	51	201	93	149	103	126	167
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	143	128	149	121	122	154	155	147
Manganese T-Mn	1.6	1.3	1.9	1.3	1.4	1.6	1.6	1.6
Mercury T-Hg	0.661	0.399	0.441	0.428	0.274	0.138	0.165	0.291
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	2.3	1.2	1.8	1.5	1.4	1.4	1.3	1.7
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	24	20.1	28.2	19.7	24.7	26.7	26.5	24.5

(completed)

Appendix 3-4a
Concentrations of Metals in Lake Trout Myomere from Windy Lake, 1997

Rescan

Appendix 3-4a
Concentrations of Metals in Lake Trout Myomere from Windy Lake, 1997

Fish	#35	#36	#37	#38	#39	#40	#41	#42	#43
Lake	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	466	447	434	447	455	463	436	422	402
Weight (g)	884	870	822	852	858	966	816	768	656
Age (yr)	21	36	16	21	19	24	15	15	12
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	80.8	78.5	76.4	80.3	81.4	80.2	77.9	78.7	76.7
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.1	0.08	0.11	0.07	0.06	0.11	0.09	0.07	0.1
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	122	167	124	90	119	185	182	115	75
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	6	3	4	5	4	6	3	4	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	256	271	256	255	237	255	279	280	300
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.036	0.029	0.021	0.057	0.041	0.045	0.026	0.066	0.018
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	3	2.7	2.8	2.7	2.4	2.6	2.7	2.3	2.9

(continued)

Appendix 3-4a
Concentrations of Metals in Lake Trout Myomere from Windy Lake, 1997

Fish	#44	#49	#50	#51	#52	#53	#54	#55
Lake	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	400	446	456	470	419	431	453	442
Weight (g)	630	972	998	1106	772	930	966	902
Age (yr)	14	19	27	20	13	23	18	15
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	77.7	80.6	82.2	78.9	79	79.5	80.2	79
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.06	0.08	0.06	0.07	0.06	0.08	0.07	0.09
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	113	81	139	121	118	174	91	103
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	5	4	8	3	5	4	3	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	294	261	235	273	278	255	252	271
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.029	0.029	0.041	0.033	0.03	0.067	0.031	0.03
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.5	0.5	0.4	0.6	0.5	0.5	0.5	0.5
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.7	2.6	2.7	2.7	2.7	2.6	2.4	2.8

(continued)

Appendix 3-4a
Concentrations of Metals in Lake Trout Myomere from Windy Lake, 1997

Fish	#56	#57	#58	#59	#60	#61	#62	#63
Lake	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	437	423	422	418	401	399	406	458
Weight (g)	864	898	798	776	664	620	802	932
Age (yr)	14	12	15	14	12	16	14	26
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	77.7	78.1	79.2	78.8	79.5	80	78.5	82
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.1	0.09	0.12	0.1	0.06	0.06	0.08	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	66	78	72	101	94	112	265	93
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	3	2	2	2	3	3	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	268	286	264	282	278	277	278	243
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.02	0.024	0.021	0.031	0.032	0.06	0.022	0.064
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	2.7	2.6	2.7	2.6	2.5	2.8	2.5

(completed)

Appendix 3-4b
Concentrations of Metals in Lake Trout Livers from Windy Lake, 1997

Appendix 3-4b
Concentrations of Metals in Lake Trout Livers from Windy Lake, 1997

Fish	#35	#36	#37	#38	#39	#40	#41	#42	#43
Lake	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	466	447	434	447	455	463	436	422	402
Weight (g)	884	870	822	852	858	966	816	768	656
Age (yr)	21	36	16	21	19	24	15	15	12
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	73.5	80.4	78	74.9	74.1	79.8	78.7	79.9	75.3
Aluminum T-Al	19	13	15	25	38	35	9	5	7
Arsenic T-As	0.65	0.15	0.35	0.6	0.62	0.73	0.32	0.17	0.67
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.05	0.03	0.02	0.05	0.07	0.05	0.02	<0.02	0.03
Calcium T-Ca	52	44	47	53	53	48	46	64	55
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	50.1	10.4	27.9	23.8	37.8	24.8	26.6	3.8	23.1
Iron T-Fe	591	101	121	782	776	806	146	159	162
Lead T-Pb	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	166	128	157	166	167	134	155	190	156
Manganese T-Mn	1.3	1	0.8	1.5	1.6	1.2	0.9	1.7	1.5
Mercury T-Hg	0.036	0.046	0.046	0.104	0.08	0.105	0.026	0.058	0.028
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	2.4	2.3	1.3	2.4	4	2.8	1.8	0.8	2.5
Silver T-Ag	0.2	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	46.4	29.2	38.7	37.2	44.6	31.6	37.6	19.6	39.8

(continued)

Appendix 3-4b
Concentrations of Metals in Lake Trout Livers from Windy Lake, 1997

Fish	#44	#49	#50	#51	#52	#53	#54	#55	#56
Lake	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy	Windy
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	400	446	456	470	419	431	453	442	437
Weight (g)	630	972	998	1106	772	930	966	902	864
Age (yr)	14	19	27	20	13	23	18	15	14
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	74.3	77.4	82.3	81.6	74.9	80	81.9	81	79.2
Aluminum T-Al	6	17	38	20	13	17	10	6	7
Arsenic T-As	0.51	0.77	0.33	0.37	0.59	0.35	0.44	0.37	0.3
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.03	0.03	0.06	0.03	0.02	0.06	0.02	0.02	<0.02
Calcium T-Ca	50	70	54	53	69	60	60	52	54
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	33.8	25.7	21.7	49.1	8.6	18.8	19	13.1	20.5
Iron T-Fe	191	302	766	280	319	460	554	189	255
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	189	145	114	131	142	124	118	126	144
Manganese T-Mn	1.4	1.2	0.7	0.8	1.3	1.2	0.7	0.8	1
Mercury T-Hg	0.038	0.056	0.084	0.054	0.064	0.071	0.047	0.024	0.027
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.9	2.5	2.4	1.7	1.9	1.8	2	1.5	1.7
Silver T-Ag	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	46.2	40.1	26.8	37.7	34.3	34.5	29.7	27.1	35.4

(continued)

Appendix 3-4b
Concentrations of Metals in Lake Trout Livers from Windy Lake, 1997

Fish	#57	#58	#59	#60	#61	#62	#63
Lake	Windy	Windy	Windy	Windy	Windy	Windy	Windy
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	423	422	418	401	399	406	458
Weight (g)	898	798	776	664	620	802	932
Age (yr)	12	15	14	12	16	14	26
Tissue	LV	LV	LV	LV	LV	LV	LV
Moisture %	79.7	81.1	80	80.9	-	80.7	82.4
Aluminum T-Al	<5	7	6	7	7	7	40
Arsenic T-As	0.28	0.38	0.22	0.28	0.45	0.29	0.31
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	0.02	<0.02	<0.02	0.05	<0.02	0.05
Calcium T-Ca	68	59	63	63	85	72	58
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	8.5	21.4	14.2	14.8	14	17	26
Iron T-Fe	112	219	205	167	722	97	790
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	126	133	144	121	138	131	122
Manganese T-Mn	1.1	0.9	1	0.8	1.1	0.9	0.8
Mercury T-Hg	0.029	0.026	0.045	0.039	0.153	0.033	0.069
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.4	1.5	1.6	1.5	2	1.5	1.8
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Zinc T-Zn	27.9	33.6	32.8	26.3	35.6	31.6	30.2

(completed)

Appendix 3-5a
Concentrations of Metals in Lake Trout Myomere from Aimaoktak Lake, 1997

Appendix 3-5a
Concentrations of Metals in Lake Trout Myomere from Aimaoktak Lake, 1997

Fish	#36	#49	#54	#55	#56	#57	#60	#74	#75
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	306	504	448	590	483	338	416	547	580
Weight (g)	298	1375	922	2150	1122	398	732	1358	1648
Age (yr)	12	15	29	20	14	12	14	16	17
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	116	181	82	53	62	182	69	92	144
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	3	4	3	2	4	3	2	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	275	269	239	250	257	278	251	279	258
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.184	0.206	0.427	0.503	0.441	0.195	0.18	0.338	0.56
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	3.1	2.8	2.3	2.7	2.7	3.1	2.8	2.7	2.8

(continued)

Appendix 3-5a
Concentrations of Metals in Lake Trout Myomere from Aimaoktak Lake, 1997

Fish	#76	#77	#78	#79	#80	#81	#82	#83
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	708	484	519	621	469	589	542	493
Weight (g)	3700	1084	1810	2600	1362	2625	1616	1346
Age (yr)		17	22	29	14		18	29
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	0.06	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	51	103	87	120	75	60	113	164
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	4	4	2	3	2	3	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	247	264	244	253	282	265	255	229
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.764	0.427	0.212	0.836	0.312	0.34	0.135	0.393
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.4	2.6	2.5	2.2	2.5	2.5	2.3	2.2

(continued)

Appendix 3-5a
Concentrations of Metals in Lake Trout Myomere from Aimaoktak Lake, 1997

Fish	#84	#85	#86	#87	#88	#93	#94	#95
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	512	530	447	461	424	558	577	475
Weight (g)	1500	1564	800	912	780	1712	2044	1244
Age (yr)	19	17	11	13	17	21	25	18
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	85	119	125	56	53	85	70	84
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	2	2	3	2	1	2	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	254	243	275	266	268	253	265	250
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.328	0.374	0.236	0.21	0.28	0.358	0.662	0.32
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	2.2	2.9	2.9	2.6	2.2	2.3	2.5

(completed)

Appendix 3-5b
Concentrations of Metals in Lake Trout from Aimaoktak Lake, 1997

Appendix 3-5b
Concentrations of Metals in Lake Trout Livers from Aimaoktak Lake, 1997

Fish	#36	#49	#54	#55	#56	#57	#60	#74	#75
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	306	504	448	590	483	338	416	547	580
Weight (g)	298	1375	922	2150	1122	398	732	1358	1648
Age (yr)	12	15	29	20	14	12	14	16	17
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	<10	<10	<10	<10	12	<10	<10	<10	<10
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	0.7	0.8	1.7	1.3	1.8	0.7	1.6	2.3	1.4
Iron T-Fe	88	183	761	300	269	84	178	247	116
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	15	14	16	11	12	15	15	12	12
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.305	0.433	1.4	0.971	0.547	0.269	0.361	0.828	0.801
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	<0.3	<0.2	0.2	<0.1	0.1	<0.2	0.1	0.1	0.1
Silver T-Ag	<0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	0.2	0.2
Zinc T-Zn	3.2	3	3.4	2.8	3.2	3.1	3.7	3.2	2.7

(continued)

Appendix 3-5b
Concentrations of Metals in Lake Trout Livers from Aimaoktak Lake, 1997

Fish	#76	#77	#78	#79	#80	#81	#82	#83
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	708	484	519	621	469	589	542	493
Weight (g)	3700	1084	1810	2600	1362	2625	1616	1346
Age (yr)		17	22	29	14		18	29
Tissue	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	<10	<10	<10	<10	<10	11	<10	<10
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	0.9	1.8	1.2	<0.5	<0.5	0.6	0.5	<0.5
Iron T-Fe	1520	1170	2710	580	529	1140	587	3100
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	13	14	12	18	17	14	19	17
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	1.73	0.625	0.387	1.23	0.536	0.649	0.427	0.552
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver T-Ag	0.2	0.2	0.1	<0.1	<0.1	0.1	0.1	<0.1
Zinc T-Zn	2.3	3	2.5	1.9	1.7	2	2.1	2

(continued)

Appendix 3-5b
Concentrations of Metals in Lake Trout Livers from Aimaoktak Lake, 1997

Fish	#84	#85	#86	#87	#88	#93	#94	#95
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	512	530	447	461	424	558	577	475
Weight (g)	1500	1564	800	912	780	1712	2044	1244
Age (yr)	19	17	11	13	17	21	25	18
Tissue	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	<10	<10	<10	14	<10	<10	<10	21
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	1.5	0.9	<0.5	1.7	0.7	0.8	0.9	1.6
Iron T-Fe	14600	2800	695	231	629	249	173	383
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	13	21	16	16	17	19	19	15
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.57	0.544	0.258	0.436	0.771	0.512	1.1	0.689
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	<0.1	<0.1	0.1	0.2	0.2	<0.1	<0.1	0.2
Silver T-Ag	0.2	0.2	0.1	0.3	<0.1	<0.1	0.1	0.2
Zinc T-Zn	2.8	2.5	2.9	3.6	3.2	2.6	2.3	3.6

(completed)

Appendix 3-5c
Concentrations of Metals in Lake Whitefish Myomere from Aimaoktak Lake, 1997

Appendix 3-5c
Concentrations of Metals in Lake Whitefish Myomere from Aimaoktak Lake, 1997

Fish	#37	#40	#43	#58	#59	#61	#62	#63	#64
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	523	511	523	520	493	483	474	479	498
Weight (g)	2000	1600	2100	1875	1775	1482	1324	1166	1348
Age (yr)	36	37	34	36	22	37	34	46	35
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	0.06	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	85	93	99	156	80	112	114	63	71
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	4	2	3	2	4	3	5	4
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	266	266	251	243	249	268	279	232	314
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.339	0.275	0.438	0.308	0.214	0.247	0.37	0.427	0.286
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	3	2.8	2.9	3.1	3	2.7	3	2.6	2.8

(continued)

Appendix 3-5c
Concentrations of Metals in Lake Whitefish Myomere from Aimaoktak Lake, 1997

Fish	#65	#66	#67	#68	#69	#70	#71	#72
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	473	434	417	411	479	471	411	493
Weight (g)	1264	1034	942	912	1338	1852	1006	1488
Age (yr)	36	16	16	17	36	23	16	24
Tissue	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	96	71	94	110	130	56	57	80
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	2	2	2	3	2	2	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	294	318	296	326	308	298	307	299
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.303	0.103	0.095	0.069	0.231	0.181	0.109	0.168
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.8	2.9	2.8	2.9	2.8	2.8	3.1	2.9

(continued)

Appendix 3-5c
Concentrations of Metals in Lake Whitefish Myomere from Aimaoktak Lake, 1997

Fish	#73	#100	#107	#118	#119	#156	#157
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	449	477	512	430	475	427	486
Weight (g)	1100	1446	1612	1154	1414	1000	1418
Age (yr)	24	23	24	15	24	16	36
Tissue	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	0.05	0.05	<0.05	0.07	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	191	120	78	76	82	95	83
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	3	3	2	2	3	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	300	291	307	317	282	321	294
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.138	0.22	0.187	0.091	0.213	0.097	0.248
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.6	3.1	3.1	3.2	2.9	3.1	2.4

(completed)

Appendix 3-5d
Concentrations of Metals in Lake Whitefish Livers from Aimaoktak Lake, 1997

Appendix 3-5d
Concentrations of Metals in Lake Whitefish Livers from Aimaoktak Lake, 1997

Fish	#37	#40	#43	#58	#59	#61	#62	#63	#64
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	523	511	523	520	493	483	474	479	498
Weight (g)	2000	1600	2100	1875	1775	1482	1324	1166	1348
Age (yr)	36	37	34	36	22	37	34	46	35
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	0.03
Calcium T-Ca	<10	<10	<10	<10	<10	<10	<10	<10	<10
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	1	0.7	0.6	<0.5	0.7	<0.5	0.6	1.1	1.2
Iron T-Fe	213	211	222	201	134	282	179	219	473
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	14	12	16	15	13	12	15	17	16
Manganese T-Mn	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	1.2	1.06	1.5	0.811	0.43	0.888	0.909	5.72	1.71
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.3
Silver T-Ag	0.2	0.2	0.1	<0.1	<0.1	<0.1	<0.1	0.5	0.2
Zinc T-Zn	2.4	2.3	2.7	2.2	2.6	1.9	2.2	3.5	3

(continued)

Appendix 3-5d
Concentrations of Metals in Lake Whitefish Livers from Aimaoktak Lake, 1997

Fish	#65	#66	#67	#68	#69	#70	#71	#72
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	473	434	417	411	479	471	411	493
Weight (g)	1264	1034	942	912	1338	1852	1006	1488
Age (yr)	36	16	16	17	36	23	16	24
Tissue	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02
Calcium T-Ca	<10	18	<10	<10	<10	<10	<10	<10
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	0.6	0.8	0.6	<0.5	<0.5	<0.5	0.6	1.9
Iron T-Fe	186	137	172	148	163	58	144	169
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	15	20	17	22	18	18	22	17
Manganese T-Mn	<0.2	0.2	<0.2	0.3	0.4	0.2	0.2	<0.2
Mercury T-Hg	0.907	0.455	0.393	0.18	0.583	0.335	0.36	0.673
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.1	<0.2	0.2	0.1	0.1	<0.1	0.1	0.2
Silver T-Ag	0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.1	0.5
Zinc T-Zn	2.4	3.2	3.1	2.9	2.3	2	3.1	3.4

(continued)

Appendix 3-5d
Concentrations of Metals in Lake Whitefish Livers from Aimaoktak Lake, 1997

Fish	#73	#100	#107	#118	#119	#156	#157
Lake	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak	Aimaoktak
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	449	477	512	430	475	427	486
Weight (g)	1100	1446	1612	1154	1414	1000	1418
Age (yr)	24	23	24	15	24	16	36
Tissue	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	-	-	-	-	-
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	<10	<10	<10	<10	<10	<10	<10
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	0.7	1.3	1.1	0.6	<0.5	<0.5	1
Iron T-Fe	284	203	83	78	97	109	152
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	16	16	16	21	16	18	16
Manganese T-Mn	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2
Mercury T-Hg	0.583	0.963	0.424	0.252	0.31	0.317	2.5
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	<0.2	0.2	0.1	0.1	<0.1	0.1	0.3
Silver T-Ag	0.2	0.3	0.1	<0.1	<0.1	<0.1	0.2
Zinc T-Zn	2.6	3.7	2.6	3.1	2.1	3.1	3.3

(completed)

Appendix 3-6a
Concentrations of Metals in Lake Trout Myomere from Pelvic Lake, 1998

Appendix 3-6a
Concentrations of Metals in Lake Trout Myomere from Pelvic Lake, 1998

Fish	#69	#70	#71	#72	#114	#144	#145	#184	#185	#204
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	458	430	457	753	623	667	650	435	435	442
Weight (g)	1010	1102	982	4250	2550	2800	3000	952	856	964
Age (yr)	26	17	20	24	23	25	24	24	8	8
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	81	80.2	78.5	77.9	77.3	78.7	79	80.2	78.8	79.6
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	92	88	81	68	115	60	127	133	86	74
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	2	4	3	2	2	4	3	2	1
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	246	249	256	236	253	260	255	280	278	265
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.275	0.383	0.224	0.378	0.296	0.359	0.315	0.342	0.168	0.148
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.5	2.6	2.8	3.1	2.8	2.6	2.4	2.5	2.9	2.6

(continued)

Appendix 3-6a
Concentrations of Metals in Lake Trout Myomere from Pelvic Lake, 1998

Fish	#205	#240	#241	#242	#243	#244	#336	#337	#338	#339	#340
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	456	646	520	628	694	446	406	431	438	670	430
Weight (g)	1062	2850	1788	2425	3225	1028	892	880	958	2990	1014
Age (yr)	11	28	22	18	24	25	21	25	23	32	24
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	78.1	79.4	80	79.4	77.8	79.4	80.3	80.6	80	78.3	79.8
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	0.06	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	106	54	70	104	125	114	163	194	81	65	92
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	1	3	3	3	3	2	2	3	2	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	276	243	240	251	252	261	249	246	272	244	252
Manganese T-Mn	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.216	0.404	0.326	0.35	0.348	0.296	0.32	0.284	0.328	0.409	0.279
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.8	2.3	2.6	2.7	3	2.2	2.3	2.4	2.6	3	2.5

(completed)

Appendix 3-6b
Concentrations of Metals in Lake Trout Livers from Pelvic Lake, 1998

Appendix 3-6b
Concentrations of Metals in Lake Trout Livers from Pelvic Lake, 1998

Fish	#69	#70	#71	#72	#114	#144	#145	#184	#185	#204
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	458	430	457	753	623	667	650	435	435	442
Weight (g)	1010	1102	982	4250	2550	2800	3000	952	856	964
Age (yr)	26	17	20	24	23	25	24	24	8	8
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	82.2	79.8	82.6	76.6	75.5	74.6	79.6	81.8	-	80.2
Aluminum T-Al	13	8	<5	<5	<5	<5	<5	13	5	<5
Arsenic T-As	<0.05	0.08	0.06	<0.05	<0.05	0.05	<0.05	0.05	0.06	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.04	0.05	0.05	0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
Calcium T-Ca	103	62	63	60	97	72	88	66	80	52
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	3.5	24.2	14.8	12.8	6.2	12.7	0.9	10	5.6	7.8
Iron T-Fe	370	134	106	390	336	230	92	566	86	55
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	145	124	112	95	102	122	170	120	109	131
Manganese T-Mn	1.2	1.4	1.2	0.8	1	1	1.4	1.1	0.6	1.2
Mercury T-Hg	0.327	0.25	0.359	0.449	0.383	0.503	0.382	0.417	0.169	0.114
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.7	1.2	1.2	0.8	0.8	0.9	0.6	1.1	1.4	1.2
Silver T-Ag	<0.1	0.2	0.2	0.2	<0.1	0.2	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	21.3	33	28.8	26.4	23.7	26.5	18.2	27.6	21.8	24.2

(continued)

Appendix 3-6b
Concentrations of Metals in Lake Trout Livers from Pelvic Lake, 1998

Fish	#205	#240	#241	#242	#243	#244	#336	#337	#338	#339	#340
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR	LKTR
Length (mm)	456	646	520	628	694	446	406	431	438	670	430
Weight (g)	1062	2850	1788	2425	3225	1028	892	880	958	2990	1014
Age (yr)	11	28	22	18	24	25	21	25	23	32	24
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	69.4	76.7	77.5	74.9	76.2	82	80.6	73.2	79	75.8	74.1
Aluminum T-Al	5	<5	<5	<5	6	10	7	19	18	5	25
Arsenic T-As	0.06	<0.05	0.05	<0.05	0.06	0.06	<0.05	0.09	<0.05	<0.05	0.12
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	0.02	0.03	<0.02	<0.02	0.03	0.03	0.08	0.08	0.04	0.06
Calcium T-Ca	69	63	75	57	74	78	80	65	64	53	75
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	15.8	17.2	11.6	10.3	10.9	2.5	2.5	26.8	16.6	25.9	17.9
Iron T-Fe	98	247	283	86	277	283	177	434	430	422	668
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	101	99	125	110	122	142	169	161	132	109	152
Manganese T-Mn	0.9	0.9	1.3	1	1.1	1	1.4	1.9	1.2	1	2
Mercury T-Hg	0.216	0.396	0.433	0.28	0.403	0.274	0.357	0.418	0.443	0.543	0.513
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1	0.9	1	0.9	1.6	0.8	0.6	1.4	1.1	1.2	1.9
Silver T-Ag	0.3	0.2	0.1	0.2	<0.1	<0.1	<0.1	0.2	0.1	0.3	0.2
Zinc T-Zn	26.8	27.1	27.8	23.8	26.1	19.3	19.4	44.1	30.1	32.3	44.8

(completed)

Appendix 3-6c
Concentrations of Metals in Lake Whitefish Myomere from Pelvic Lake, 1998

Appendix 3-6c
Concentrations of Metals in Lake Whitefish Myomere from Pelvic Lake, 1998

Fish	#28	#29	#30	#31	#32	#33	#63	#64	#65	#66	#67
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	381	341	370	411	410	379	399	377	395	365	381
Weight (g)	676	512	650	954	876	714	698	732	816	612	734
Age (yr)	17	14	15	24	24	16	30	22	21	14	14
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	-	80.2	79.1	79.8	79.6	79.5	82.5	79.1	80.3	80.1	78.8
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	261	143	114	136	142	158	216	172	160	252	284
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	2	2	2	1	3	2	4	3	2	2	3
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	249	262	259	259	255	263	219	264	248	264	267
Manganese T-Mn	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.3	0.3
Mercury T-Hg	0.082	0.102	0.042	0.222	0.117	0.047	0.184	0.035	0.037	0.065	0.053
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.4	0.2	0.3	0.3
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.8	2.6	2.5	2.3	2.4	2.7	2.4	2.6	2.7	2.7	2.6

(continued)

Appendix 3-6c
Concentrations of Metals in Lake Whitefish Myomere from Pelvic Lake, 1998

Fish	#68	#110	#111	#112	#113	#140	#141	#142	#143	#182	#183
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	316	409	400	382	407	370	383	382	381	406	386
Weight (g)	412	910	878	676	824	722	698	748	754	806	722
Age (yr)	10	24	29	23	34	20	22	21	22	32	25
Tissue	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY	MY
Moisture %	79.9	78.8	78.6	80	81.2	79.1	80.5	79.8	79.8	81.3	80
Aluminum T-Al	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Arsenic T-As	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Calcium T-Ca	232	141	187	171	231	146	170	145	151	100	144
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Iron T-Fe	3	2	4	3	3	2	2	2	3	3	2
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	254	232	252	243	223	254	252	262	264	247	257
Manganese T-Mn	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Mercury T-Hg	0.031	0.144	0.082	0.044	0.139	0.037	0.05	0.044	0.056	0.121	0.104
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	0.3	0.2	0.2	0.3	0.2	0.3	0.2	0.3	0.3	0.2	0.3
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	2.9	2.4	2.5	2.4	2.3	2.6	2.5	2.6	2.4	2.2	2.4

(completed)

Appendix 3-6d
Concentrations of Metals in Lake Whitefish Livers from Pelvic Lake, 1998

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Appendix 3-6d
Concentrations of Metals in Lake Whitefish Livers from Pelvic Lake, 1998

Fish	#28	#29	#30	#31	#32	#33	#63	#64	#65	#66	#67
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	381	341	370	411	410	379	399	377	395	365	381
Weight (g)	676	512	650	954	876	714	698	732	816	612	734
Age (yr)	17	14	15	24	24	16	30	22	21	14	14
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	-	75.9	82.5	80.4	-	-	-	81.1	-	80.8
Aluminum T-Al	<5	<5	<5	<5	7	<5	11	<5	<5	<5	<5
Arsenic T-As	0.06	0.06	0.05	<0.05	<0.05	<0.05	0.06	0.06	<0.05	0.08	<0.05
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.07	0.04	0.04	0.02	0.08	0.06	0.09	0.21	0.09	0.05	0.02
Calcium T-Ca	69	118	110	69	55	64	56	75	61	94	49
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	7	5	6.2	5.3	6.2	6.7	4.4	6.2	4.2	4	3.1
Iron T-Fe	107	107	132	60	159	138	159	357	175	114	97
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	144	161	187	133	131	145	146	142	124	152	154
Manganese T-Mn	1.3	1.9	3.4	1.4	1.6	1.6	1.9	2.3	1.5	1.7	1.6
Mercury T-Hg	0.234	0.285	0.065	0.258	0.29	0.151	0.556	0.304	0.103	0.135	0.074
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.2	1.4	1.1	0.6	1.2	1.4	1.4	1.9	0.9	1.3	0.8
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	27.8	28.1	25.6	19.6	21.9	26.3	22.9	24.9	19.7	28.4	18.8

(continued)

Appendix 3-6d
Concentrations of Metals in Lake Whitefish Livers from Pelvic Lake, 1998

Fish	#68	#110	#111	#112	#113	#140	#141	#142	#143	#182	#183
Lake	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic	Pelvic
Code	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH	LKWH
Length (mm)	316	409	400	382	407	370	383	382	381	406	386
Weight (g)	412	910	878	676	824	722	698	748	754	806	722
Age (yr)	10	24	29	23	34	20	22	21	22	32	25
Tissue	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV	LV
Moisture %	-	77.5	81.5	-	75.5	77.6	-	-	-	77.8	-
Aluminum T-Al	<5	5	<5	5	15	<5	10	<5	9	14	10
Arsenic T-As	0.05	<0.05	<0.05	0.05	0.09	<0.05	0.07	0.06	0.06	0.06	0.07
Barium T-Ba	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Beryllium T-Be	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium T-Cd	0.08	0.05	0.13	0.17	0.07	0.07	0.17	0.1	0.17	0.07	0.08
Calcium T-Ca	74	58	45	123	54	63	161	73	58	52	53
Chromium T-Cr	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt T-Co	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Copper T-Cu	4.9	3.5	2.8	5.1	5.2	1.4	4.1	5.8	6.6	3.6	4.1
Iron T-Fe	95	105	193	376	178	113	127	193	345	148	262
Lead T-Pb	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Magnesium T-Mg	151	148	127	162	153	162	144	157	147	138	145
Manganese T-Mn	1.7	1.6	1.7	1.4	1.5	1.7	1.3	1.6	2.4	1.6	1.4
Mercury T-Hg	0.112	0.396	0.285	0.268	0.514	0.073	0.25	0.233	0.289	0.315	0.315
Molybdenum T-Mo	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel T-Ni	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Selenium T-Se	1.2	1.2	1	1.9	1.4	0.8	1.2	1.4	1.6	1.2	1.2
Silver T-Ag	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc T-Zn	25.7	24.7	19.7	24.6	24	18.9	24.2	28.3	27	22	24

(completed)