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

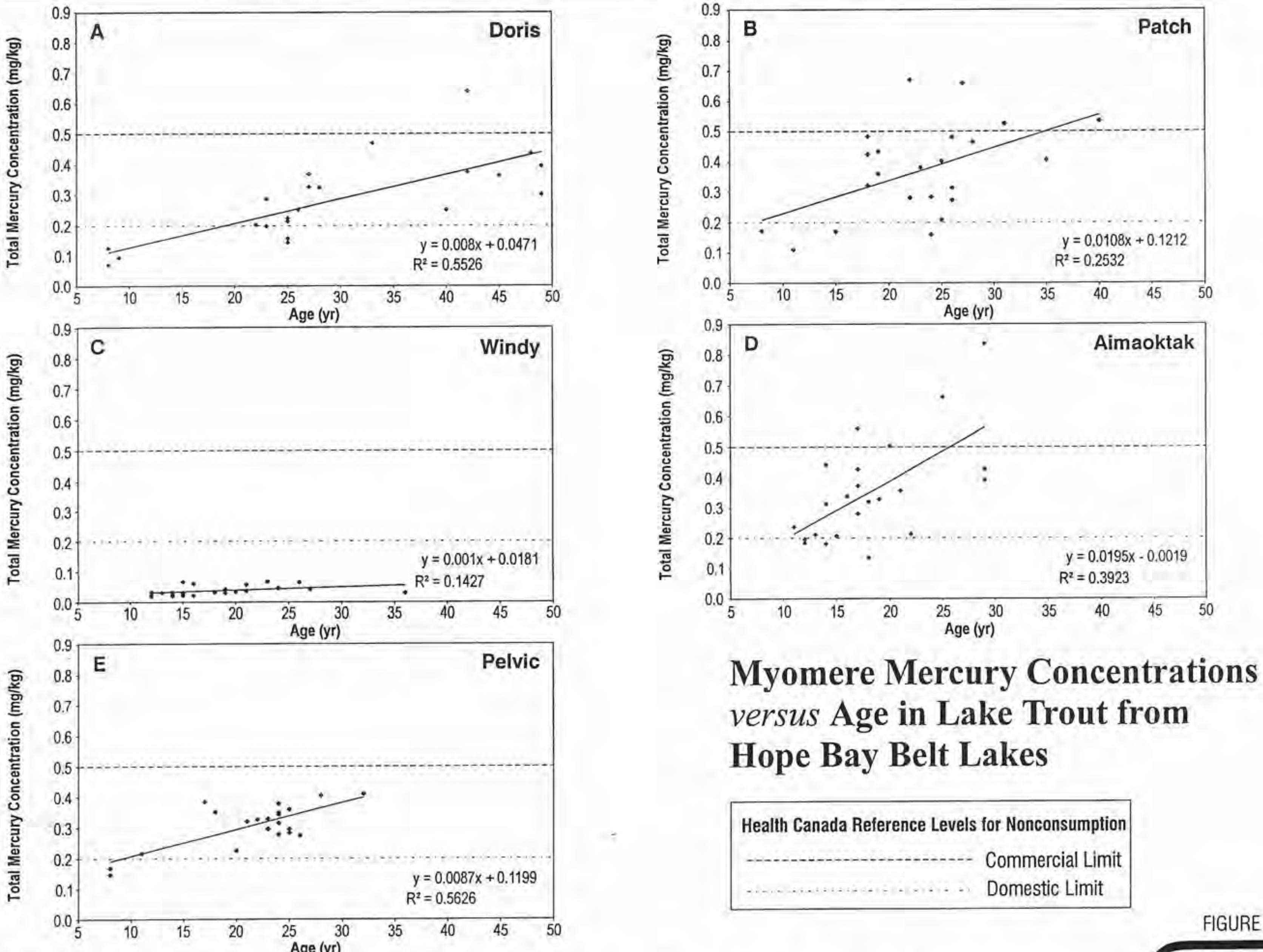
Figure 3-1 presents the regressions of total mercury concentration in lake trout myomere against age. As the R^2-values show, strong correlations were found for Pelvic and Doris trout (R^2= 0.5626 and 0.5526, respectively). A weak correlation was found for Aimaoktak and Patch trout (R^2= 0.3923 and 0.2532, 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

BHP   Fisheries and Oceans Canada   Pêches et Océans Canada   Rescan™

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

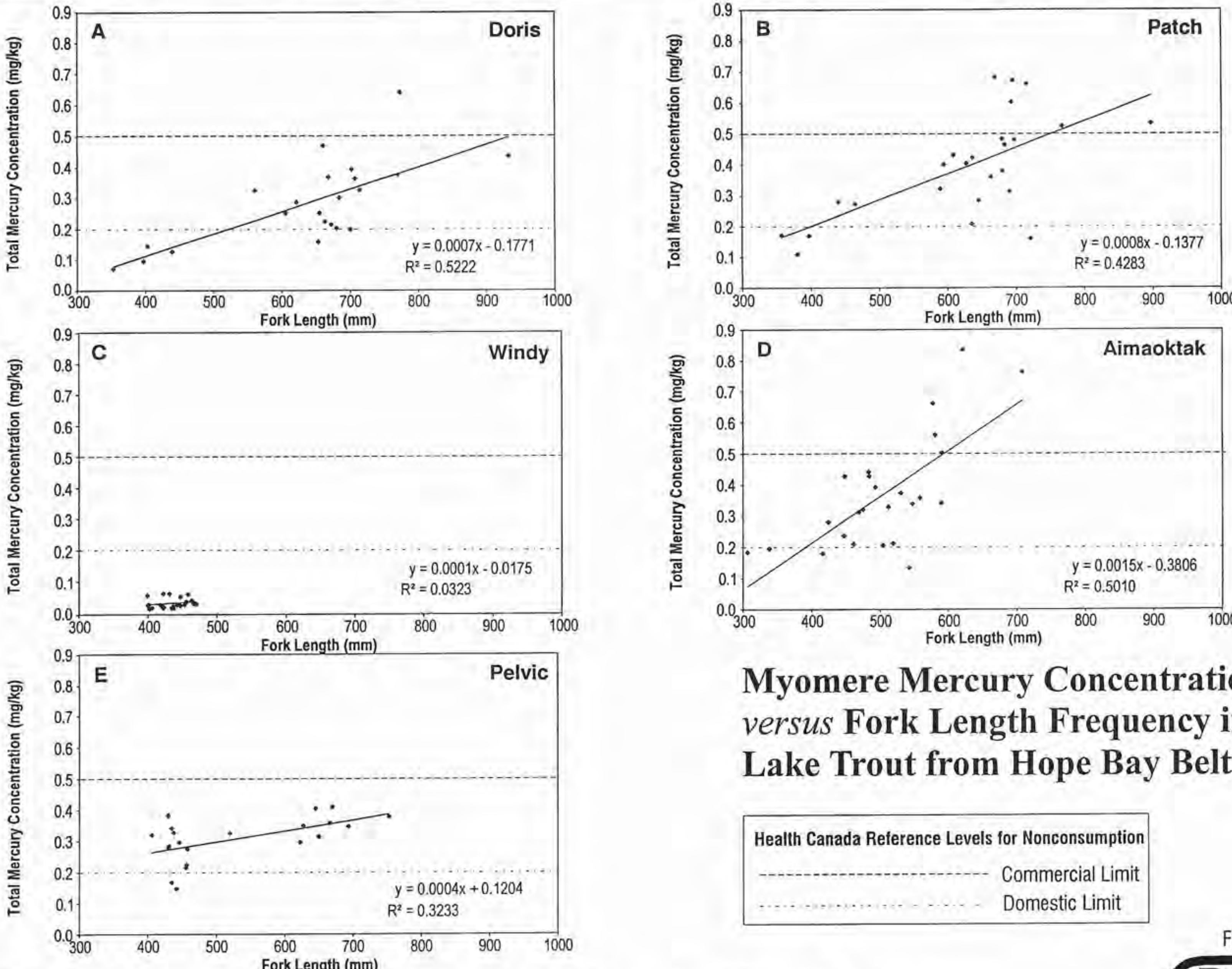
with:

(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

Health Canada Reference Levels for Nonconsumption

- - - - - - Commercial Limit
· · · · · · Domestic Limit

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:

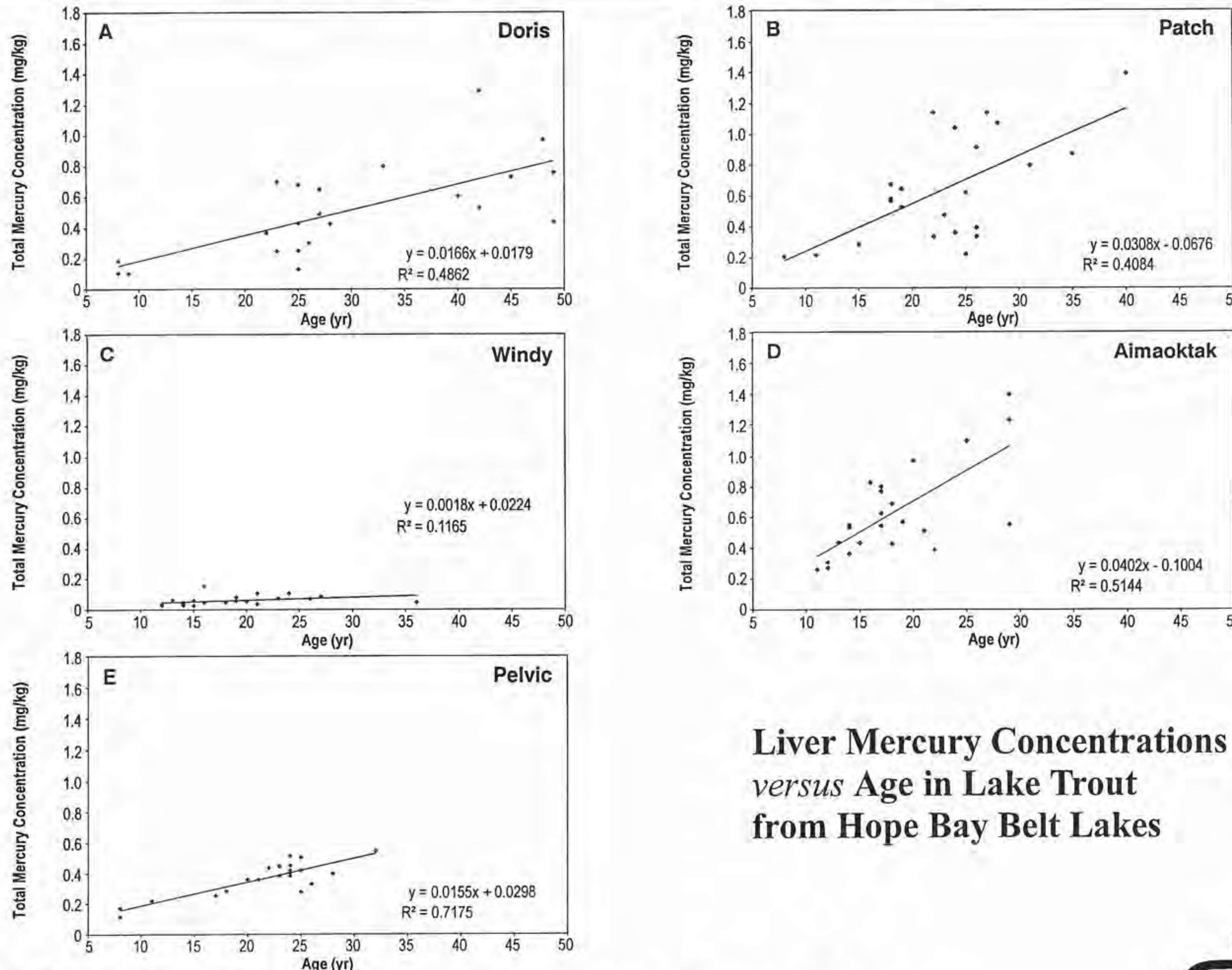
(g) LKTR Mean T-Hg (LV) vs. Age: Pelvic>Aimoaktak>Doris>Patch>Windy

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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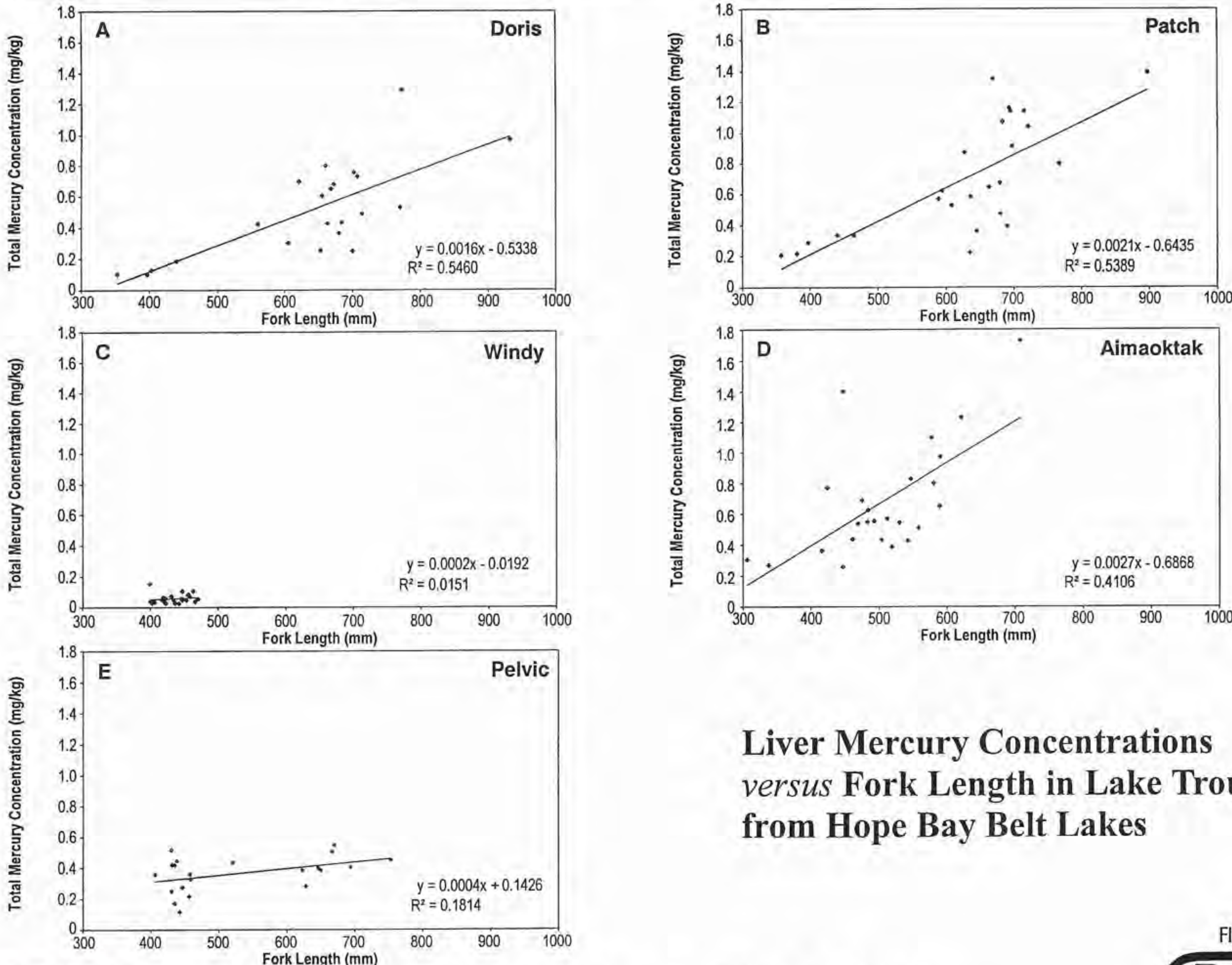
Rescan™



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

FIGURE 3-4

BHP Fisheries and Oceans Canada Pêches et Océans Canada Rescan

- 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.

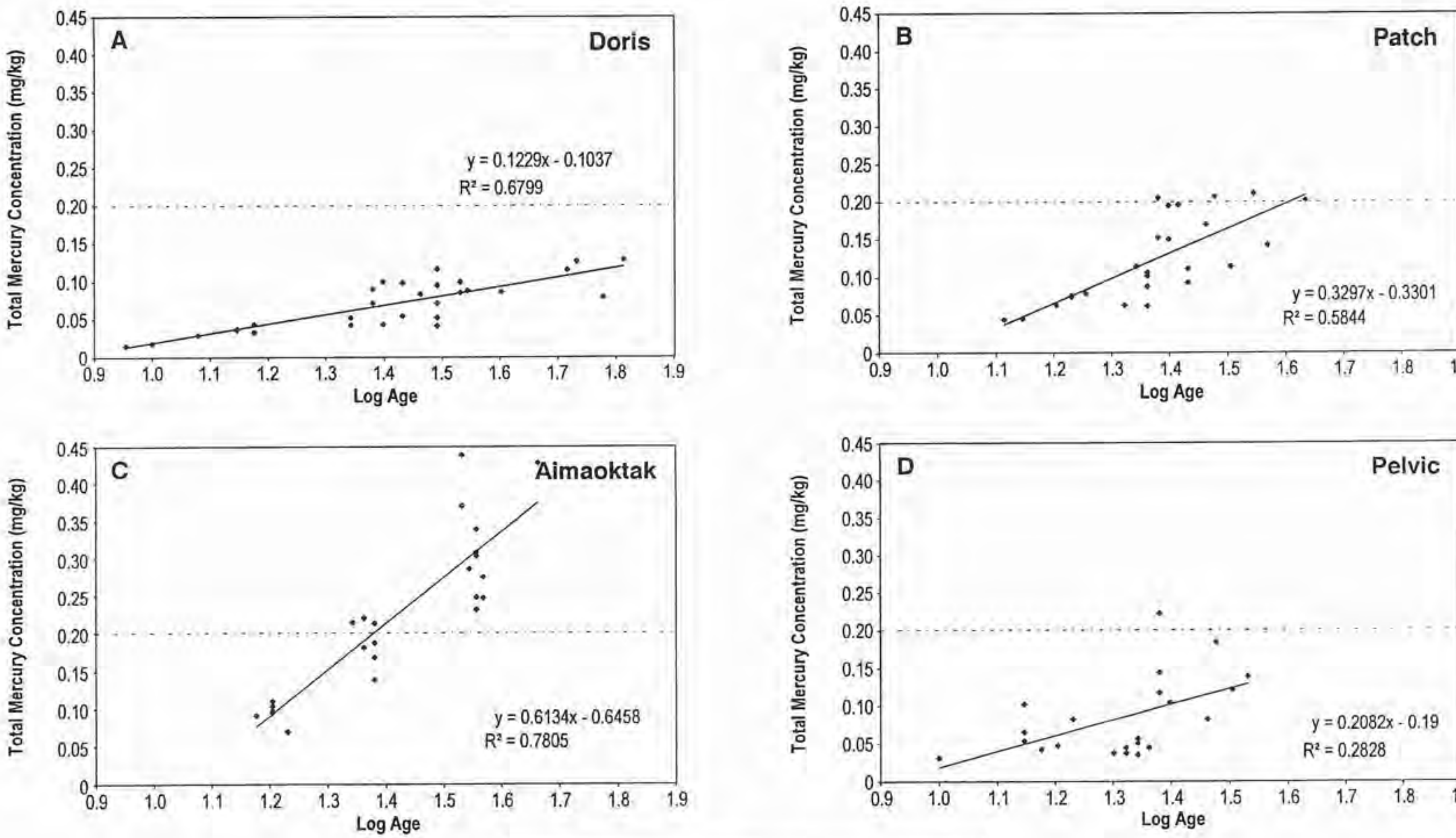
Again, the Windy tissue results appear to support this hypothesis. Liver mercury concentrations in Windy trout were less than those in all other samples, including lake whitefish. This indicates that Windy trout were probably exposed to lower levels of mercury than fishes in other lakes, trout and whitefish 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:



Health Canada Reference Levels for Nonconsumption

------------------------ Commercial Limit

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

FIGURE 3-5

BHP

Fisheries and Oceans Canada | Pêches et Océans Canada

Rescan™

(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:

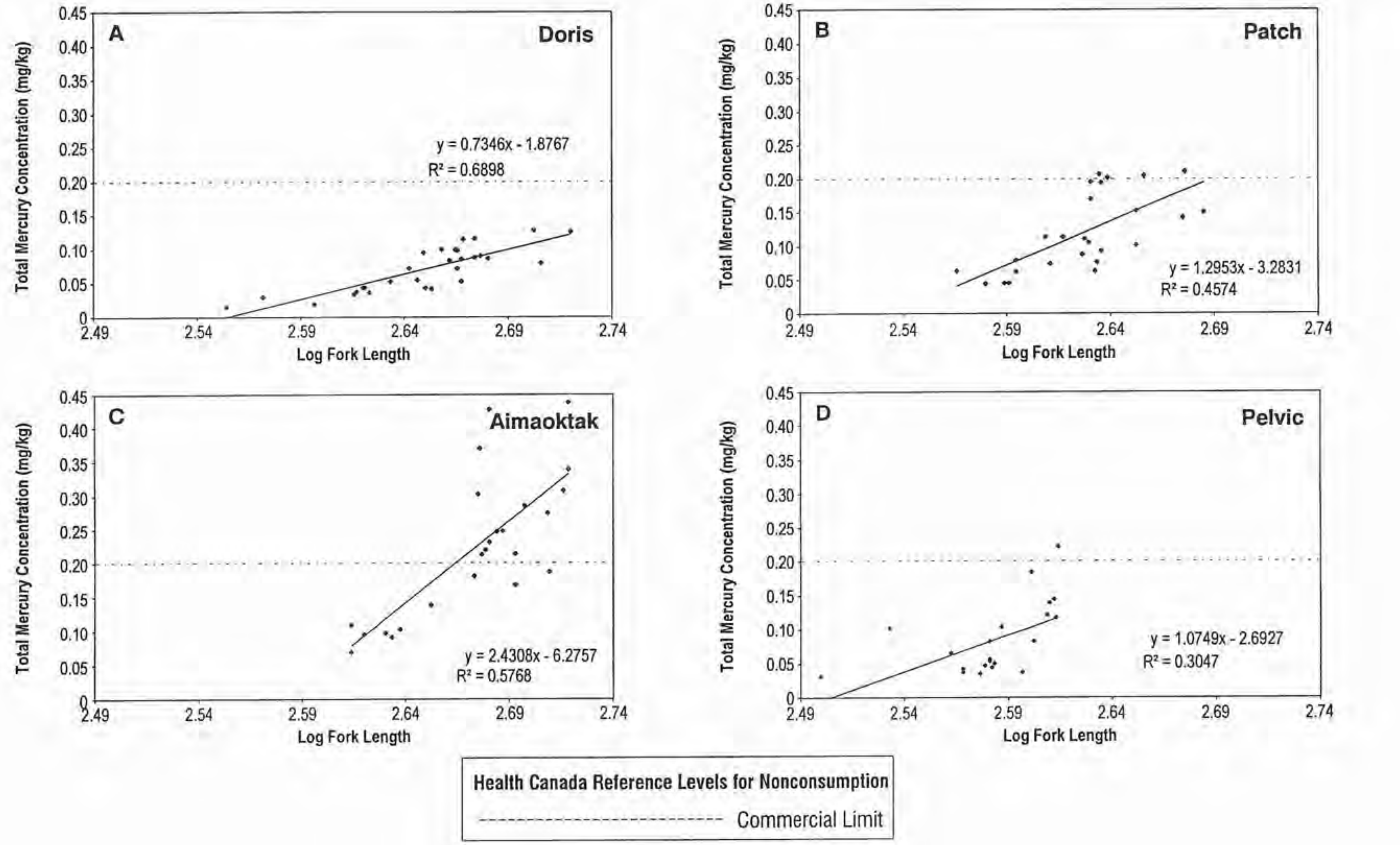
(m) LKWH Mean Fork Length: Aimoaktak>Doris>Patch>Pelvic

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

BHP

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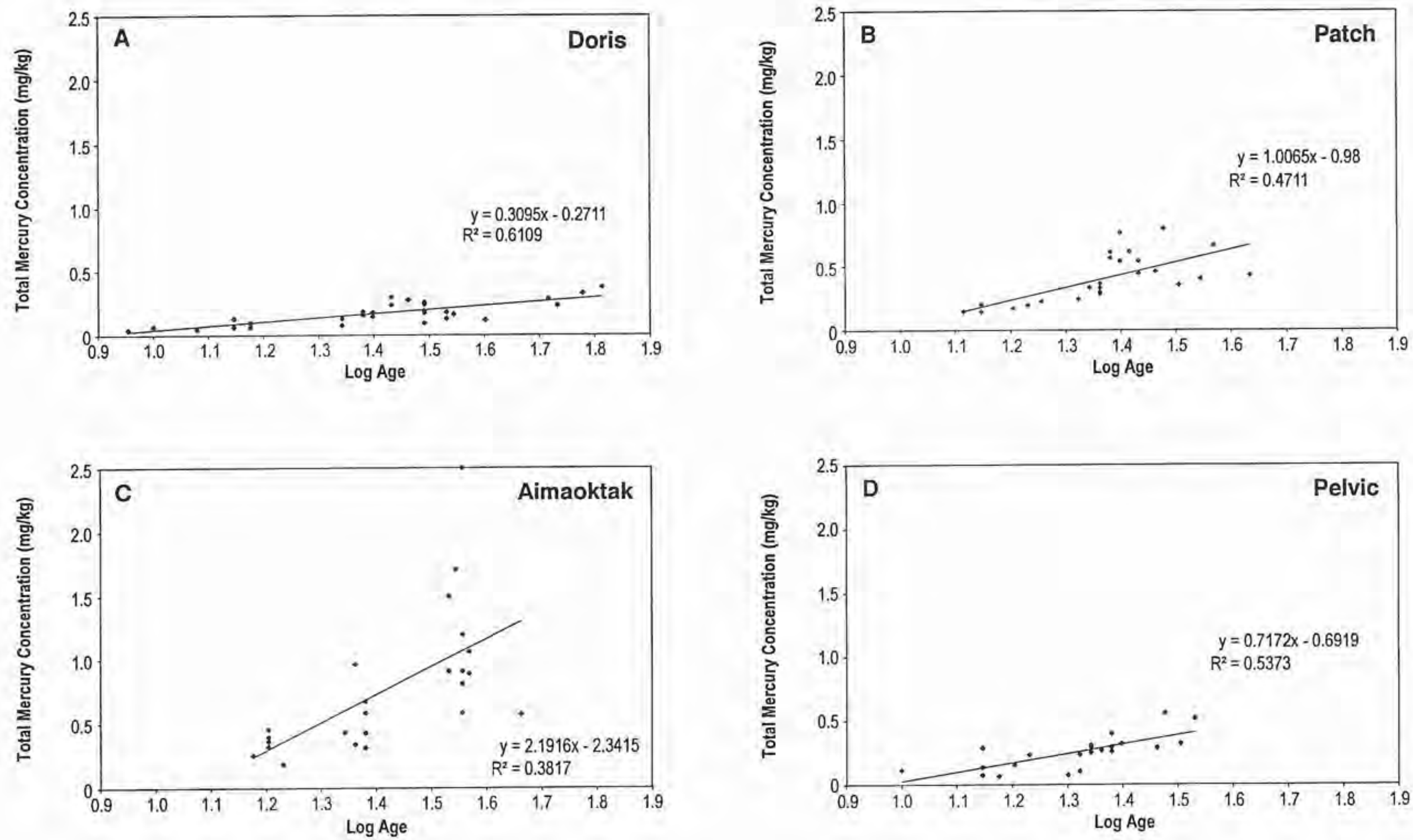

Liver Mercury Concentrations *versus* Age in Lake Whitefish from Hope Bay Belt Lakes

FIGURE 3-7

BHP

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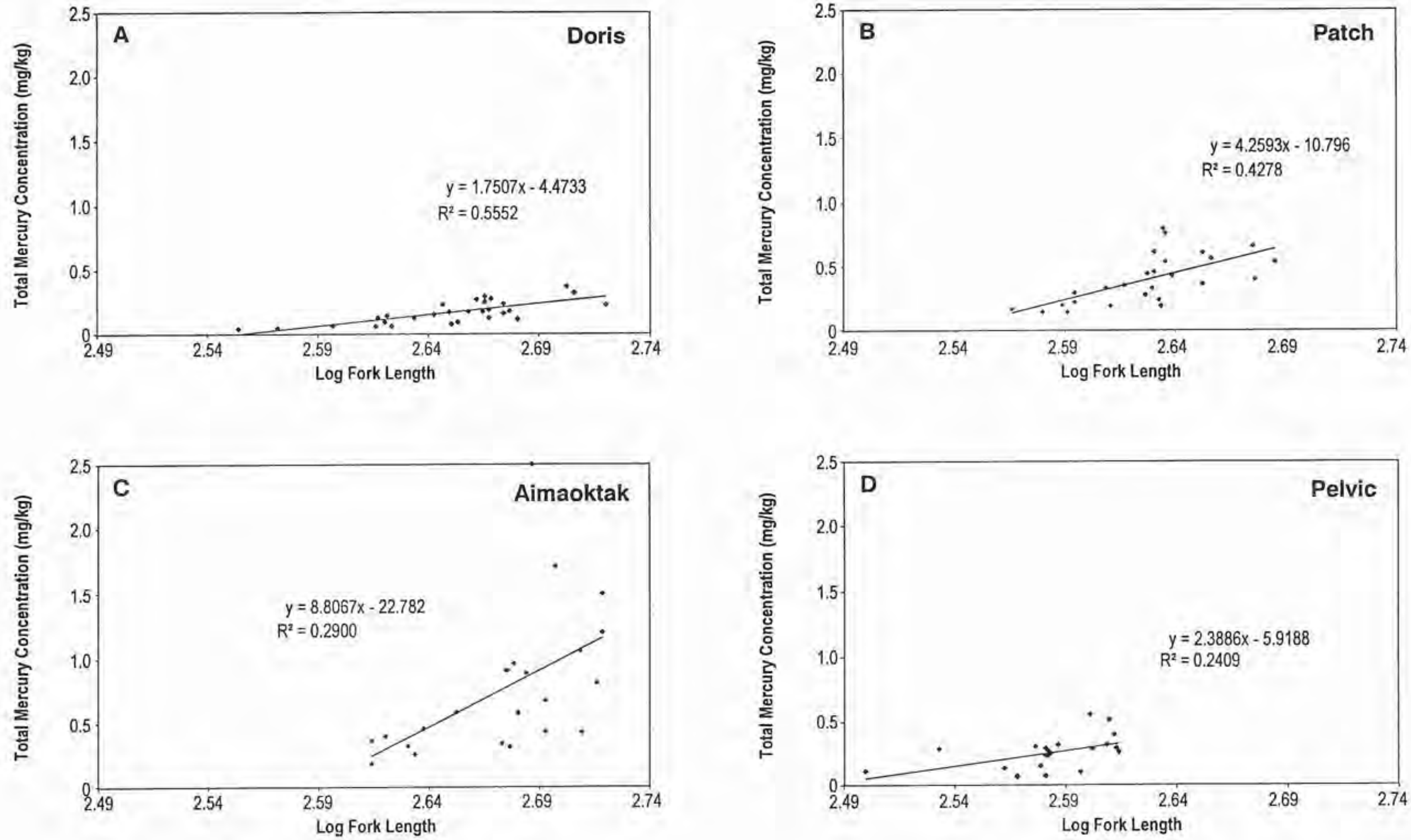
Rescan™



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

FIGURE 3-8

BHP   Fisheries and Oceans Canada   Pêches et Océans Canada   Rescan™

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.

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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

Rescan

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

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

Rescan

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

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)