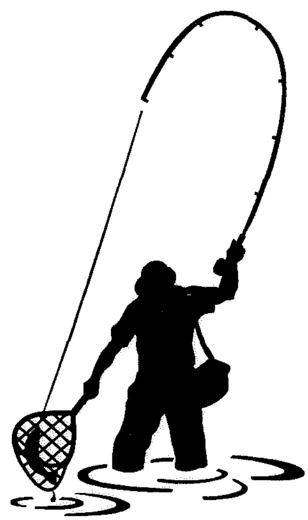
DIOXIN MONITORING PROGRAM

STATE OF MAINE

2001



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Acknowledgements

Successful collection of the samples was accomplished directly by DEP staff, assisted by the Penobscot Indian Nation on the Penobscot River. The Department of Inland Fisheries and Wildlife and Atlantic Salmon Commission also assisted in collecting samples and providing nets. Bjorn Lake, a graduate student at the University of Maine, conducted the SPMD studies. Close cooperation with the the Environmental Chemistry Laboratory at the University made the analytical results much better.

EXECUTIVE SUMMARY

The goal of Maine's Dioxin Monitoring Program, established in 1988, is "to determine the nature of dioxin contamination in the waters and fisheries of the State". Charged with administration of the program, the Department of Environmental Protection (DEP) is required to sample fish once a year below no more than 12 bleached pulp mills, municipal wastewater treatment plants, or other known or likely sources of dioxin. DEP is required to incorporate the results of all studies into a report to the Joint Standing Committee on Natural Resources by March 31 of the following year. Costs of sample collection and analysis are assessed to the selected facilities. DEP is advised by the Surface Water Ambient Toxic (SWAT) Monitoring Program Technical Advisory Group in implementation of the program.

The primary objective of the Dioxin Monitoring Program is to monitor dioxin in fish for assessment of ecological and human health. A second objective is to measure trends, progress toward reduction in environmental concentrations, and effectiveness and need for further controls. A third objective is to determine if bleached kraft pulp mills are discharging dioxin into Maine rivers, which is prohibited as of December 31, 2002 by the dioxin law of 1997 [38 MRSA section 420(2)(I)] The final test is that fish (or surrogate) downstream have no more dioxin than fish (or surrogate) upstream of a mill's discharge, the 'above/below' test.

In 2001, the Dioxin Monitoring Program continued development of a suitable 'above/below' fish test. Intensive monitoring of bass and suckers on the Androscoggin, Kennebec, and the Penobscot rivers was conducted. Small juvenile bass were sampled again for the second year but liver and caged mussel sampling were abandoned. In addition, as part of DEP's SWAT monitoring program, semi-permeable membrane devices (SPMDs) were deployed as potential surrogates for the fish test.

Fish Consumption Advisories

Based on data through 1999, the Maine Bureau of Health revised the fish consumption advisories in August 2000 (Appendix 1). There is a 'General Consumption Advisory for All Inland Surface Waters due to Mercury Contamination'. Also there are more restrictive 'Specific Freshwater Fish Consumption Advisories' for the Androscoggin River, Kennebec River below Madison, the Penobscot River below Lincoln, Salmon Falls River below Berwick, and Sebasticook River (including East and West branches) due to PCBs and dioxins. An advisory on lobster tomalley was continued from 1994 along the entire coast of Maine due to dioxins and PCBs.

Findings of the 2001 Program

1. Concentrations of 2378-TCDD (TCDD) or dioxin toxic equivalents (DTEh) increased slightly in 8 species/station samples, decreased slightly in 8 other species/station samples, and remained the same in 22 species/station samples compared to 2000. Most of those that increased were more similar to concentrations in 1998-99 than to those of 2000.

2. Concentrations of DTEH exceeded the Bureau of Health's Fish Tissue Action Level for cancer (FTALc=1.5 ppt) in trout and bass above Rumford, and in suckers below Rumford and Jay on the Androscoggin River, in brown trout below Hinkley on the Kennebec River, and in eels from the below Brewer on the Penobscot River.

3. The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in higher levels of total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level at other locations as well. Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition.

4. Concentrations of 2378-TCDD (TCDD) and DTEh in all fish samples collected below bleached kraft mill discharges to the Androscoggin River, Kennebec River, and Penobscot River, were significantly greater than those at reference stations unimpacted by point sources.

5. Concentrations of TCDD and DTEo in white perch from Androscoggin Lake were significantly greater, although marginally so, than in game fish from all other lakes (n=8) or river reference stations that have been sampled. However, concentrations of TCDD and DTEh were lower than in previous years, continuing what appears to be a declining trend since the lake was first sampled in 1996. Concentrations were also lower than those in fish from the Androscoggin River.

6. There was no significant difference in TCDD, TCDF or DTEh in bass or suckers from above and below SAPPI Westbrook's paper mill, but at both stations concentrations remain significantly higher than at any other reference station.

7. Since the development of the Above/Below test began in 1997, over 78 tests have been conducted for different dioxins, species, tissue types, and other surrogates in an attempt to develop a test powerful enough to accurately measure any differences above and below a mill. Juvenile and mature bass, sucker filets and semi-permeable membrane devices show the most promise, depending on station and year, and will be tested again in the 2002 program.

INTRODUCTION

Maine's Dioxin Monitoring Program (DMP), established in 1988, has been amended and reauthorized through 2002 by the Maine legislature. The goal of the program is "to determine the nature of dioxin contamination in the waters and fisheries of the State". Charged with administration of the program, the Department of Environmental Protection (DEP) is required to sample fish once a year below no more than 12 bleached pulp mills, municipal wastewater treatment plants, or other known or likely sources of dioxin. The Department is also required to sample sludge once a quarter from the same facilities.

The primary objective of the DMP is to monitor dioxin in fish for assessment of ecological health and of human health. The data are used by the Maine Bureau of Health (BOH) to determine the need for any Fish Consumption Advisories to protect human consumers of fish from certain Maine rivers. The data are also used by DEP and other state and federal agencies in determining impacts of discharge of dioxin on wildlife species.

A second objective is to continue monitoring at some historical stations to measure trends. Trends are followed to measure progress toward reduction in environmental concentrations and effectiveness and need for further controls.

A third objective, to identify sources and magnitude of dioxin discharges, received new emphasis in 1997 when the Maine legislature enacted LD 1633 "An Act to Make Fish in Maine Rivers Safe to Eat and Reduce Color Pollution". The key requirement is that 'a (bleach kraft pulp) mill may not discharge dioxin into its receiving waters' [38 MRSA section 420(2)(I)]. Interim tests that concentrations of TCDD in effluent from the bleach plant must be below EPA's method 1613 nominal detection limit (10 ppq) by July 31, 1998 and TCDF must be below the same detection limit by December 31, 1999 have been achieved. As the final test, by December 31, 2002 fish below a bleached kraft pulp mill have no more dioxin than fish above the mill, the so-called "above/below (A/B) fish test". Although the DMP has successfully detected differences above and below discharges in past years, as the amount of dioxin discharged is reduced, the DMP has been modified to allow an enhanced ability to detect smaller differences with known statistical confidence.

The monitoring program is coordinated with other ongoing programs conducted by the Department, US Environmental Protection Agency (EPA), or dischargers of wastewater. The proposed annual monitoring plan must be submitted to the Surface Water Ambient Toxic (SWAT) monitoring program Technical Advisory Group (TAG), created under 38 MRSA section 420-B, for review and advice. The selected facilities must be notified of their inclusion in the proposed program at least 30 days prior to submittal to the TAG. The Department must incorporate the results of all studies into a report due the Natural Resources Committee by March 31 of the following year. A draft of the report is reviewed by the TAG before completion of the final report. Costs of sample collection and analysis are assessed as a fee to the selected facilities. Payment of the fees is a condition of the waste discharge license granted by the state for continued operation and discharge of wastewater to waters of the State. However, if the selected facility is a publicly owned treatment works (POTW), then the fees may be assessed to the known or likely industrial generator of dioxin and payment will not be a condition of the waste discharge license of the POTW.

Due to continuing controversy over the effects of dioxin on human and ecological health, the US Environmental Protection Agency (EPA) announced that in 1991 it would begin a thorough scientific reassessment of dioxin. EPA proposed that the process would be open to the public and consequently held several meetings to share information and receive comments. A draft report was issued in 1994 and subsequent review in 1995 by EPA's Science Advisory Board called for revisions of some chapters. Revised drafts published in 2000 indicate that dioxin may exhibit reproductive and developmental effects, immuno-toxic effects, neuro-toxic effects, and cancer. In addition, the reports find that concentrations of dioxin in the environment have decreased since the 1970S. Also 'EPA currently estimates that the amount of dioxin in tissues of the general human population closely approaches within a factor of 10, the levels at which adverse effects might be expected to occur'. In March 2001 EPA's Scientific Advisory Board published its draft review of EPA's new revisions and is divided on whether or not dioxin is a carcinogen, but does believe EPA has underestimated non-cancer effects. The SAB also does not agree that there is enough evidence to support EPA's statement about current body burdens and probable adverse health impacts.

DEP has determined, from fish collected since 1984, that concentrations of dioxins in fish from locations unaffected by local sources are less than 0.15 ppt, while concentrations in fish below those sources of dioxin are consistently greater than that. Consequently, as one method of determining known or likely sources of dioxin, a Fish Monitoring Threshold (FMT=0.15 ppt) is used by DEP to determine stations that will be retained in the annual program.

For informing the public about potential risk from consuming fish contaminated with dioxin and dioxin-like compounds, the BOH publishes fish consumption advisories. These advisories are based on a comparison of a Fish Tissue Action Level (FTAL) for dioxin toxic equivalent (DTE) concentrations with the 95^{th} percentile upper confidence limit on the mean DTE in fish tissue. Should a tissue concentration exceed an FTAL, a fish consumption rate (e.g., #meals per month) which is unlikely to result in deleterious effects is determined. Two FTALs have been derived for evaluating potential deleterious effects from exposure to dioxins and dioxin-like compounds. Both FTALs were developed using standard USEPA risk assessment methods (EPA 1997). For potential carcinogenic effects associated with long-term exposure, BOH has developed a FTALc of 1.5 ppt, while for reproductive and developmental effects potentially arising from shorter exposure durations, BOH has developed a FTALr of 1.8 ppt (Frakes, 1990). The FTALr for reproductive and developmental effects is relevant to women of childbearing age, pregnant women, and lactating women. The FTALs are compared to the concentration of DTE in edible portions of the fish, skinless filet data. Where whole fish data are reported, the DTE concentration is divided by a factor of 3.5, determined from previous studies with white suckers, to estimate skinless filet concentration. In this report all comparisons with DTE in fish are made with FTALc, since that is the lower of the two and protective of both effects.

PROGRAM DESIGN

The primary emphasis of the 2001 program was to collect fish samples from the appropriate stations and species from each river such that accurate, complete, and current data are available to assess impact to wildlife and human consumers. The program design included sampling at least one station below each major source to document trends and sampling of historic stations that showed dioxin above the FMT, whether or not any fish consumption advisories were issued. Finally the program was modified to evaluate the ability to detect minimum significant differences of the appropriate magnitude for the above/below fish test.

The 2001 program was initially drafted by DEP according to the objectives listed above and sent to participating facilities for comment in early May and to the SWAT TAG later in the month. The workplan was discussed finalized at the SWAT TAG meeting on July 3, 2001.

In 2001 all stations were monitored for ecological and/or human health assessment and trends (Table 1). At least 5 game fish (bass or other important species) were collected from each station and analyzed as skinless fillets. At some

Table 1. 2001 Dioxin Monitoring Program- Stations, facilities, and species

STATION	FACILITY	SPECIES
Androscoggin R		
Gilead	Meadwestvaco	bass, sucker, trout
Rumford	Mead	bass, sucker
Riley	IP	bass, sucker
Liv Fls(Otis imp)	IP	bass, sucker
Turner (GIP)	Mead & IP	bass
Lisbon Falls	Mead & IP	bass
Androscoggin Lake	Mead & IP	bass, sucker,w perch
Kennebec R		
Norridgewock	SAPPI Somerset	bass, sucker, trout
Fairfield	SAPPI Somerset	bass, sucker, trout
Sidney	KSTD	bass, trout
Penobscot R		
Woodville	Lincoln P&P	bass, sucker
S Lincoln	Lincoln P&P	bass, sucker
Milford	Fort James Co	bass, sucker
Veazie	Fort James Co	bass, sucker
Orrington	Brewer	eel
Presumpscot R		
Windham	SAPPI Westbrook	bass, sucker
Westbrook	SAPPI Westbrook	bass, sucker
Salmon Falls R		
S Berwick	Berwick Sewer Dist.	bass
Sebasticook R		
W Br Palmyra	Town of Hartland	bass

stations, the fish were analyzed individually, while at other stations, fish were combined into composite samples (Table 2)in order to minimize cost and remain under the monetary cap.

In order for DEP to accurately determine whether or not there is a discharge of dioxin from a mill, for the Above/Below (A/B)Fish Test, the minimum significant difference (MSD) that can be determined with acceptable statistical probability needs to be relatively small and relevant to background concentrations. Ideally the MSD should be established before the test at some absolute value or fraction of the background concentration. During debate

Table 2. 2001 Dioxin Monitoring Program, Sample Sizes and Type

STATION	SMB	sSMB	WHS	OTHER	N
Androscoggin R					
Gilead				5 RBT	5
Rumford Point	5		2C5		7
Rumford	5		2C5		7
Riley	10	10	10C2		30
Livermore Falls	10	10	10C2		30
Turner (GIP)	5	2C5			7
Lisbon	5				5
Androscoggin L	2C5*		2C5	2C5 WHP	6
Kennebec R					
Norridgewock	10		10	5 BNT	25
Fairfield	10		10	5 BNT	25
Sidney	5			5 BNT	10
Penobscot R					
Woodville	10		10		20
S Lincoln	10		10		20
Milford	5		2C5		7
Veazie	5		2C5		7
Bangor				2C5 EEL	2
Presumpscot R					
Windham	5		2C5		7
Westbrook	5		2C5		7
Salmon Falls R					
S Berwick	2C5				2
W Br Sebasticook R					
Palmyra	5				5
				total	234
				limit	235

* 2 composites of 5 fish each
sSMB= small bass

in the legislature, a MSD of 10% of the background concentration was proposed as a goal by DEP. This would work for TCDF and DTE, where measurable quantities are determined, but not for TCDD, where background concentrations are generally below detection. For TCDD, the detection level (0.05-0.1 ppt wet weight) itself was proposed to serve as the goal. Although initially thought to be achievable, results from 1997-2000 showed that MSDs were generally not close to the 10% goal. The best results were with filets of mature bass or suckers or with whole juvenile bass, depending on the year and station.

Therefore, in 2001 parts of the DMP was repeated to gather data for a second year to see if MSDs from earlier years could be repeated or improved (Table 2). For the A/B test, 10 samples of both species were collected at each of 3 pairs of stations. At the Androscoggin River in Riley and Livermore Falls, filets from 10 legal sized smallmouth bass were collected to be analyzed as individuals. In addition 20 male white suckers were collected to be analyzed as 10 composites of 2 fish each for the suckers, in order to increase the sample volume and decrease the detection limit. For the second year, 10 juvenile bass were also collected to be analyzed individually at both stations. At Norridgewock and Fairfield on the Kennebec and at Woodville and South Lincoln on the Penobscot River, filets from 10 legal sized smallmouth bass and 10 suckers were also collected to be analyzed as individuals. At all other Above/Below stations, ten white suckers were captured and combined into 2 composites of 5 fish each. Trout were analyzed as individuals at all stations.

All samples were analyzed for all 2378-substituted dioxins and furans. Station locations along with specified fish species are shown in Table 1. Station location maps show exact locations of collections (Appendix 6).

At stations affected by a single discharger, sampling will continue yearly until there are at least two consecutive cycles for each species where dioxin is below the FMT and is not increasing. At stations affected by more than one discharger where fish concentrations are not below the FMT, each discharger will continue to be included in the annual sampling program until enough evidence has been gathered to demonstrate that dioxin is no longer present in the discharge in significant quantities. Such evidence must be at least 8 consecutive sludge analyses, equally distributed over all seasons for a minimum of two years, that show no 2378-TCDD (TCDD) detected at a suitably low detection level, (2) full congener analysis of sludge for all 2378 substituted dioxins and furans, (3) other pertinent information such as process changes, changes in hook-ups that show reductions in the level of dioxins and furans being discharged to insignificant levels.

The preferred sampling time is late in the summer when fish are likely to be most contaminated after being exposed to higher concentrations of dioxin during low river flows and after significant growth has occurred. At some locations there has been a problem collecting enough fish later in the summer. Here sampling began in mid-May to try to insure that a suitable sample was collected. These stations were also visited after the beginning of July. If fish were captured during the later period, those samples were submitted for analyses. Otherwise, the fish collected during the early period were used. Sampling at other stations began in July (Appendix 8).

As part of DEP's SWAT monitoring program, semi-permeable membrane devices (SPMDs) were deployed in 2 experiments in the Androscoggin River (described in a later section).

SAMPLING PROCEDURES

Fish were collected by DEP with assistance of state agencies and the Penobscot Indian Nation. Upon capture, fish were immediately killed, weighed and measured, rinsed in river water, wrapped in aluminum foil with the shiny side out, labeled, and placed in a cooler on ice for transport to the DEP lab. Chain-of-custody forms were used to record all field information and document all transfers. In the lab, all fish samples were frozen and later transported whole to the Senator George J. Mitchell Center for Environmental and Watershed Research (formerly the Water Research Institute) at the University of Maine for analysis. All other procedures generally followed EPA's Sampling Guidance Manual for the National Dioxin Study (July 1984). A laboratory log was kept for an inventory of samples in the lab at any time and final disposition.

Most of the facilities in the program already sample sludge or effluent as part of their Maine Sludge Spreading Permit or Waste Discharge License or Federal NPDES permit. Data from those programs provide adequate information about sources of dioxin. Therefore, no additional sludge samples were collected as part of this program. Effluent data are also used when available to indicate sources and any trends.

CALCULATIONS

In this report, DTE are shown as a range with non-detects calculated at zero (DTEo) and at the detection limit (DTEd) as a mean for all samples of a given species at each station (Table 3). For comparison with the FMT and FTALc, and comparison between years and stations, DTEh were used as calculated using non-detects at 1/2 the detection limit. The upper 95th percentile confidence limit (UCL) was used for these comparisons, consistent with the policy of the BOH. In some cases (reference stations) DTEo were also discussed since those were below the FMT while

DTEh exceeded the FMT, which shows the importance of low detection limits and the treatment of non-detects. For the other stations both DTEo and DTEh were above the FMT, and DTEo were not discussed.

A related issue is that of EMPCs, estimated maximum possible concentrations. Some compounds, particularly hydroxydiphenyl ethers (DPEs), are coextracted with furans. Various steps have successfully been taken to minimize these interferences, but some DPEs remain. In this report, EMPCs were treated as non-detects.

Statistical analyses of differences in TCDD and DTEh between stations were performed using the either the t-test or non-parametric Mann-Whitney test. In this report only differences that are statistically significant at p=0.05 will be reported as significant. Trends were determined using Kendall's tau, a rank-order correlation statistic, for the period 1997-2001. The minimum number of data points needed is 4, and with only 5 for this period, there were no significant trends at p=0.05. There were some trends significant at P=0.10 described as marginal in the following discussions.

RESULTS AND DISCUSSION.

Most of the samples of fish targeted in the initial workplan were collected (Appendix 2). Mean concentrations of TCDD and DTEh for each species and station for the last 5 years are shown in Table 3 while earlier data are in Appendix 10. A description of fish collected and results for each sample location with respect to the objectives of the program is discussed below. For each station there are (1) a comparison of DTEh 95th upper confidence level (95UCL) to the Fish Tissue Action Level cancer endpoint (FTALc=1.5 ppt in filets, 5.25 in whole suckers), (2) a comparison of TCDD and DTEh with those at reference stations, (3) a discussion of trends in TCDD and DTEh in fish and (4) a discussion of TCDD and TCDF in sludge or wastewater as an indicator of trends in discharges. Following discussion of each station is a section of the Above/Below test comparing the efficacy of many different tests.

TCDD in fish have normally been below detection (0.1 ppt) in river reference stations (except the Presumpscot at Windham) and lakes (except Androscoggin Lake) tested. Trace amounts of DTEh (0.2-0.3 ppt, less than 10% of the FTALc) at these reference stations are likely due to the ubiquitous atmospheric deposition.

Androscoggin River

Gilead- Five rainbow trout and one brown trout were collected near Peabody Island in Gilead, while five bass and the ten white suckers were caught further downsteam at Rumford Point (Appendix

7). As both stations are downstream of the American Pulp and Paper Co's bleached kraft mill in Berlin, New Hampshire, they are therefore not true reference stations unimpacted by direct discharge of dioxin. Both stations are upstream of all Maine mills on the river and are considered the same station relative to point sources.
DTEh in rainbow trout, brown trout, bass and suckers were 178%, 171%, 102%, 66% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in higher levels of total toxic equivalents (TTEh) that further exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Every year measured, TCDD and DTEh in fish have been significantly higher at this station than in fish from reference stations in Maine (Table 3). There was no significant trend for the period 1997-2001 for any species. The American Tissue mill in Berlin, New Hampshire, has reported to have switched to elemental chlorine free (ECF) bleaching (chlorine dioxide) in 1994. The mill closed in 2001.

<u>Rumford-</u> Five smallmouth bass and ten white suckers were collected from the river reach from just below the discharge from MeadWestvaco Corporation's bleached kraft pulp and paper mill in Rumford downstream about 4 miles to Dixfield (Appendix 7). Concentrations of DTEh in the bass and in the suckers were 55% and 45% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in higher levels of total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in the suckers as well (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. TCDD and DTEh concentrations were significantly greater than reference stations on other Maine rivers (Table 3). There was a marginally significant decline in concentrations of TCDD and DTE in suckers, but not for bass, during the period 1997-2001. No sludge data have been reported since 1989. Concentrations of both TCDD and TCDF have been reported below variable detection levels in final effluent since 1993 and below a 10 ppq detection limit in bleach plant effluent since 1998 up through 2000, the latest data are available (Appendix 4).

TABLE 3. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH 1997-2001

			1997		1998		1999		2000		2001	
WATER/STATION	SPECIES	TIS	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
ANDROSCOGGIN LAKE												
Wayne	bn trout	f										
	bass	f			0.2	0.4-1.0	0.1	0.2-0.8	<0.1	0.02-1.3	<0.1	0.1-0.8
	w perch				0.5	0.6-1.2	0.2	0.3-0.9	0.2	0.2-0.8	0.1	0.2-0.7
	sucker	w			0.4	0.9-1.1			<0.1	0.1-1.1	<0.1	0.1-0.7
ANDROSCOGGIN R												
Gilead	rb trout		0.5	1.6-2.1	0.4	1.5-2.0	0.7	1.7-2.3	0.4	0.9-1.4	0.8	2.1-2.5
	bn trout						0.4	1.0-1.5	0.1	0.4-1.0	0.8	2.5-2.7
	bass						0.4	1.4-1.5	0.2	0.8-1.2	0.3	1.0-1.4
	sucker	w	0.5	3.4-3.8	0.9	3.1-3.5	0.8	2.9-3.3	0.3	1.8-2.2	0.1	0.7-1.1
Rumford	bass	f	0.5	1.2-1.8	0.4	1.1-1.5	0.6	1.5-1.9	0.2	0.6-1.1	0.2	0.5-1.0
	sucker	w	0.5	3.6-4.9	0.4	3.0-3.4	0.4	2.8-3.2	0.3	1.9-2.3	0.3	2.0-2.4
Riley	bass		0.3	1.1-2.2	0.2	0.8-1.0	<0.1	0.6-0.9	<0.1	0.2-0.6	0.2	0.8-1.0
	sucker	w	0.5	3.8-4.8	0.3	2.5-2.8	0.3	2.6-2.8			0.3	1.9-2.1
Livermore Falls	bass	f	0.3	1.2-1.4	0.2	1.1-1.2	0.2	0.9-1.2	0.2	0.6-1.0	0.3	0.9-1.4
	sucker	w	0.5	2.8-2.9	0.5	2.8-2.9	0.4	2.4			0.3	1.6-1.7
Auburn-GIP	bass	f	0.4	2.0-2.2	0.4	1.6-1.8	0.4	1.6-1.8	0.1	0.4-0.9	0.2	0.4-0.9
	sucker	w									0.2	0.6-0.9
Lisbon Falls	bass	f	0.6	1.3-1.8	0.5	1.1-1.5	0.7	1.7-2.1	0.2	0.5-1.0	0.4	1.1-1.5
KENNEBEC R												
Madison	bn trout	f									<0.1	<0.1-0.7
	bass	f	<0.2	0.03-1.6								
	sucker	w	<0.1	0.2-0.8								
Norridgewock	bass				<0.1	0.03-0.6	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	0.1-0.8
	bn trout								<0.1	0.04-0.7		
	sucker				<0.1	0.2-0.7	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	<0.1-0.7
Fairfield	trout	f	1.2	1.3-1.9							1.0	1.2-1.8
	bass	f	0.6	0.6-1.2	0.3	0.4-1.0	0.4	0.4-1.0	0.4	0.5-1.1	0.3	0.4-1.0
	sucker	w	1.2	1.7-2.1	0.9	1.4-1.8	0.3	0.4-1.0	0.4	0.5-1.0	0.3	0.5-1.1
Sidney	bass	f	0.2	0.3-0.9					0.2	0.2-0.8	0.2	0.4-0.9
	bn trout								0.3	0.3-0.8	0.4	0.5-1.1
Augusta	bn trout	f	0.6	1.0-1.3								
	bass	f	0.5	0.8-1.6	0.3	0.6-0.9	0.3	0.6-0.9				

TABLE 3. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH 1997-2001

WATER/STATION	SPECIES	TIS	1997 TCDD	1997 DTE	1998 TCDD	1998 DTE	1999 TCDD	1999 DTE	2000 TCDD	2000 DTE	2001 TCDD	2001 DTE
PENOBSCOT R												
E Br Grindstone	bass	f	<0.1	0.04-0.7	<0.1	0.04-0.7						
	sucker	w	<0.1	0.07-0.7	<0.1	0.07-0.7						
E Millinocket	bass	f	<0.1	0.04-0.7	<0.1	0.04-0.7						
	sucker	w	<0.1	0.09-0.7	<0.1	0.09-0.7						
Woodville	bass		<0.1	0.07-0.7	<0.1	0.06-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7
	sucker		<0.1	0.09-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7
Winn	bass						<0.1	0.2-0.8	<0.1	0.1-0.7	<0.1	<0.1-0.7
	sucker						<0.1	0.2-0.9	<0.1	0.1-0.8	<0.1	<0.1-0.7
S Lincoln	bass	f	0.2	0.4-1.0	0.2	0.4-0.9	0.4	0.6-1.0	0.2	0.3-0.9	0.4	0.5-1.1
	sucker	w	1.2	1.6-2.2	1.0	1.4-2.0	1.0	1.4-1.6	0.7	1.0-1.5	0.3	0.5-1.1
Milford	bass	f	0.2	0.4-0.9	0.2	0.2-0.8	0.1	0.4-0.7	0.2	0.3-0.9	0.3	0.5-1.1
	sucker	w	1.0	1.6-2.0	1.0	1.5-2.0	1.0	1.5-1.6	0.8	1.1-1.6	0.4	0.5-1.0
Veazie	bass	f	0.3	0.4-0.9	0.2	0.3-0.9	0.3	0.4-0.9	0.4	0.5-1.1	0.2	0.3-0.8
	sucker	w	1.1	1.3-1.9	1.0	1.2-1.8	1.1	1.3-1.7	0.9	1.2-1.7	1.3	1.7-2.2
Bangor	eel	f							1.6	2.0-2.5	1.1	1.5-2.0
PRESUMPSCOT R												
Windham	bass	f	<0.1	0.5-0.7	<0.1	0.4-0.8			<0.1	0.1-0.7	<0.1	0.1-0.8
	sucker	w	0.2	1.2-1.4	0.2	1.2-1.4					0.2	1.4-1.5
Westbrook	bass	f	0.1	0.4-0.9	<0.1	0.3-0.8			<0.1	0.2-0.8	<0.1	<0.1-0.8
	sucker	w									0.2	1.3-1.7
ST CROIX R												
Woodland	bass	f	<0.1	0.02-0.7	<0.1	0.06-0.7	<0.1	0.06-0.7				
	sucker		<0.1	0.09-0.7	<0.1	0.08-0.7	<0.1	0.07-0.7				
Baring	bass		<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	0.05-0.7				
	sucker	w	<0.1	0.07-0.8	<0.1	0.08-0.8	<0.1	0.08-0.7				
SALMON FALLS R												
S Berwick	bass	f	0.2	0.3-0.6			0.1	0.3-0.6	0.1	0.2-0.8	0.2	0.4-0.8
	lm bass						0.2	0.5-0.8				
	pickerel	f	0.6	0.8-1.0								

TABLE 3. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH 1997-2001

WATER/STATION	SPECIES	TIS	1997 TCDD	1997 DTE	1998 TCDD	1998 DTE	1999 TCDD	1999 DTE	2000 TCDD	2000 DTE	2001 TCDD	2001 DTE
SEBASTICOOK R												
E Br Corinna	lm bass		<0.1	0.1-0.7								
Newport	bass	f	0.2	1.2-1.4							0.1	0.6-0.9
Sebastcook L	bass	f							0.1	0.5-0.8		
	w perch	f							0.2	0.8-0.9		
Detroit	bass	f									0.1	0.2-0.8
W Br Harmony	bass		<0.1	0.06-0.7								
W Br Palmyra	bass	f	0.3	0.6-0.9	0.2	0.5-0.8	0.2	0.6-0.8	0.1	0.4-2.7	0.2	0.5-0.8

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents using WHO 98 toxic equivalency factors (TEF).
Range shown at nd=0 and nd=mdl, ie DTEo-DTEd

Riley- Ten legal sized smallmouth bass, ten juvenile bass, and 20 male white suckers were collected from the river above the Riley Dam, about 19 miles downstream of MeadWestvaco Corporation and upstream of International Paper Company's discharge (Appendix 7). Concentrations of DTEh in the legal sized bass and suckers were 67% and 150% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. DTEh were significantly greater than reference stations on other Maine rivers (Table 3). There was no significant trend for the period 1997-2001 for either species.

Livermore Falls- Ten legal sized smallmouth bass, 10 juvenile smallmouth bass, and 20 male white suckers were captured in the Otis Impoundment, approximately 2 miles downstream of the discharge from International Paper Company's Jay mill (Appendix 7). Concentrations of DTEh in the legal sized bass and suckers were 91% and 127% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that further exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. TCDD and DTEh were significantly greater than reference stations on other Maine rivers (Table 3). There was no significant trend for the period 1997-2001 for either species. There are no new sludge data since 1996, but concentrations of TCDD and TCDF in bleach plant effluent and final effluent are well below EPA's reporting level up through 2000, the latest data are available (Appendix 4).

Auburn-GIP- Five smallmouth bass and ten white suckers were collected in Gulf Island Pond (GIP) near the deep hole at Seagull Island, approximately 30 miles downstream of International Paper Company (Appendix 7). Concentrations of DTEh in the bass and suckers were 51% and 55% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in higher levels of total toxic equivalents (TTEh) in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. TCDD and DTEh concentrations were significantly greater than reference stations on other Maine rivers (Table 3). There was a marginally significant decline in DTE in bass during the period 1997-2001.

Lisbon Falls- Five smallmouth bass were captured in the Pejepscot Impoundment, approximately 45 miles below International Paper Company (Appendix 7). Concentrations of DTEh were 94% of the FTALc (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in higher concentrations of total toxic equivalents (TTEh) in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. TCDD and DTEh were significantly greater than reference stations on other Maine rivers (Table 3). There was no significant trend for the period 1997-2001 for bass (suckers were not sampled).

Androscoggin Lake

Wayne- Androscoggin Lake in Wayne and Leeds is a 4000 acre 38 foot deep meso-trophic lake with a unique reverse delta at the outlet formed by centuries of periodic backflow from the Androscoggin River via the Dead River into the lake. There is a dam on the Dead River that reduces but does not prevent the backflow into the lake, which usually occurs once or twice every year. Significant amounts of dioxin were found in fish from the lake in 1996, 1998, 1999, and 2000. In 2001, ten smallmouth bass, ten white perch, and ten white suckers were collected from the lake and analyzed as 2 composites of 5 fish each. DTEh were 30%, 35%, and 30% of the FTALc for bass, white perch, and suckers respectively, (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEo in white perch were significantly greater than in game fish from all other lakes (n=8) or river reference stations that have been sampled, but the difference was small (Table 3). There was a marginally significant decline in TCDD concentrations in bass during the period 1996-2001. Concentrations were also lower than those in fish from the Androscoggin River.

Kennebec River

Norridgewock- Five brown trout, ten smallmouth bass,and 10 white suckers were collected from the river at Norridgewock (Appendix 7). Although these locations are downstream of the discharge from Madison Paper Industries discharge in Madison, comparison of dioxin in fish from this station in 1998 and 1999 with that from fish caught at the Kennebec River reference station above Madison previously, showed no significant difference between the two locations. These locations therefore serve both as a reference for the river and the upstream station for the SAPPI Somerset mill.

DTEh in all three species were 28%, 31%, and 26% FTALc, but this was an artifact of relatively high detection limits as shown by DTEo at 3-6% of the FTALc for all three species (Appendix 2). In fact, TCDD and most other congeners that add significantly to the DTE were below detection and therefore the FMT for all samples. TCDF was present in all samples in small amounts. The differences between DTEh and DTEo are much larger at these stations than at any station downstream of point sources on the river, and document the problem of the impact of high detection limits and treatment of non-detects. The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. TCDD and DTEo were similar to those from previous years for this and the Madison station, but TCDF concentrations in bass were higher than ever before. DTEh vary among years due to different detection limits. The trace amount of DTE measured in these fish is likely due to long-range transport and atmospheric deposition from remote sources. This station was also used for additional development of the above/below fish test described in a later section of this report.

Fairfield- Five brown trout, ten smallmouth bass, and ten white suckers were collected from the river between the Shawmut Dam and the I-95 bridge, approximately 7-8 miles below SAPPI Somerset's bleached kraft pulp and paper mill in Skowhegan (Appendix 7). Concentrations of DTEh in bass, brown trout, and suckers were 139%, 51%, and 60% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that further exceed a Fish Tissue Action Level in these fish (DEP, 2000). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than those at the reference station at Norridgewock for all three species (Table 3). There was no significant trend for the period 1997-2001 for either species. Effluent data (Appendix 4) and sludge data (Appendix 3) document decreases in discharges over the years especially since early 1997 up to 2000, the latest data are available. Concentrations of TCDD and TCDF are well below the limits of the new law (<10ppq in the bleach plant). This station was also used for additional development of the above/below fish test described in a later section of this report.

Sidney- This station is downstream of Lockwood Dam in Waterville/Winslow which is about 10 miles downstream of the current discharges from SAPPI Somerset in Skowhegan. The Kennebec Sanitary Treatment District discharges about 2 miles downstream of the dam that processes effluent from Huhtamaki, a paper mill. Five brown trout were captured just below the dam and five smallmouth bass were collected about 10 miles below the dam in Sidney. Both of these fish samples are considered to be from the Sidney station since the fish have free movement within this river reach. Concentrations of DTEh in trout and bass were 67% and 49% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2000). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh in trout and bass were significantly greater than those at the reference station at Norridgewock (Table 3). There was no significant trend for the period 1997-2001 for either species. Sludge data from KSTD in recent years show that TCDD is below 1 ppt, but TCDF and DTEh are occasionally detected at a few ppt documenting the continued discharge of small amounts of dioxin to the river.

Penobscot River

Woodville- Although this station is downstream of Great Northern's pulp and paper mills in Millinocket and East Millinocket, fish collected at this station in 1997 and 1998, had similarly low concentrations of dioxin as the historical reference station at Grindstone on the East Branch, uninfluenced by these mills. Therefore, this station may serve as a reference station for the Penobscot River and the upstream station for Lincoln Pulp and Paper.

Ten smallmouth bass and ten white suckers were collected from this station. Concentrations of DTEh in bass and suckers were 32% and 28% of the FTALc respectively (Appendix 2), but this was an artifact of detection levels and the impact of treatment of non-detects. Concentrations of all congeners that add significantly to DTE were below detection and therefore the FMT, except for small amounts of TCDF. As a result concentrations of DTEo were only 6% of the FTALc for both species. The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Concentrations of TCDD and DTEh were similar to those of past years, but TCDF concentrations were slightly higher than in years past (Table 3).

Winn- As in previous years, at the request of Lincoln Pulp and Paper Company in Lincoln, bass (10) and suckers (5) were captured from the river at Winn, approximately 4 miles below the confluence with the Mattawamkeag River and about 8 miles upstream of the Company's bleached kraft mill in Lincoln. The Mattawamkeag River is thought by the Company to potentially be a source of dioxin downstream of the Woodville station and the Winn station is believed by the Company to be a more appropriate station for the above/below test. Funding for this work was provided by the Company above and beyond the DMP. TCDD was not detected in any sample for either species. DTEh were 29% and 28% of the FTALc for bass and suckers respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Concentrations of all congeners that add significantly to DTE were below detection and therefore the FMT, except for TCDF. As a result concentrations of DTEo were an even smaller percentage (~5%) of the FTALc for both species. Concentrations were similar to those of the Woodville station. Since these results have been variable from year to year but show no trend, they do not support the idea that there is a significant source between the Woodville station and mill. Also since the results and other fish and sediment data collected by the Penobscot Indian Nation are not conclusive and there is no barrier to prevent fish from moving up from below the mill, this station may not be a good reference for the Above/Below fish test.

<u>South Lincoln-</u> Ten smallmouth bass and ten white suckers (Appendix 7) were collected from the river near the boat ramp in South Lincoln, approximately 4 miles downstream of Lincoln Pulp and Paper Company's bleached kraft mill in Lincoln. Concentrations of DTEh in bass and suckers were 60% and 61% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than those at the Woodville reference station (Table 3). There was a significant decline in DTE and a marginally significant decline in TCDD in suckers for the period 1997-2001. This decline is likely a result of decreased discharges from the mill as documented by decreased concentrations of TCDD and TCDF in sludge (Appendix 3) and in effluent, which shows compliance with the limits of the new law (Appendix 4), since 1997 up to 2000, the latest data are available. A change in the mill's bleaching process from chlorine based bleaching to primarily oxygen based bleaching in 1999 may account for the slightly lower TCDD and DTEh concentrations in 2000, but full benefit will likely take longer to discern.

<u>Milford-</u> Located at Freese Island near the boat ramp in Costigan, this station is approximately 34 miles downstream of Lincoln Pulp and Paper Company's bleached kraft mill in Lincoln and is the upstream station for the above/below test for the Fort James mill about 5 miles downstream. Five smallmouth bass and five white suckers were captured from this station. Concentrations of DTEh in bass and suckers were both 58% of the FTALc (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than those at the Woodville reference station (Table 3).

Veazie- Five smallmouth bass and ten white suckers (Appendix 7) were collected from the Veazie Impoundment about 7-8 miles below Fort James' bleached kraft mill in Old Town.
Concentrations of DTEh in bass and suckers were 44% and 38% of the FTALc respectively (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than those at the Woodville reference station (Table 3). There was no significant trend for the period 1997-2001 for either species. This is surprising since TCDD and TCDF bleach plant effluent concentrations at the Fort James mill have continued to decline since early 1998 and have met the limits of the new law.

Orrington- Ten eels were collected from an eel fisherman from the river in Orrington, downstream of the Town of Brewer's sewage treatment plant outfall and combined into 2 composites of 5 fish each. The Brewer treatment plant treats wastewater from the Eastern Fine Paper mill which uses pulp made at Lincoln Pulp and Paper Co in Lincoln.
Concentrations of DTEh were 135% of the FTALc (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that further exceed the Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than those for bass, another top predator, at the Woodville reference station or any other station (Table 3). Concentrations were significantly greater than those in eels from this same location in 1996 but lower than in 2000 perhaps reflecting lower concentrations in Brewer's sludge and effluent or sludge from Lincoln Pulp and Paper and Fort James, have decreased since that time (Appendix 3, 4).

Presumpscot River

Windham- Five smallmouth bass and ten white suckers (Appendix 7) were collected from the Dundee Impoundment in the river in Windham. Concentrations of DTEh in bass were 30% of the FTALc but DTEo were only 6%, documenting the impact of treatment of non-detects (Appendix 2). Concentrations of all congeners that add significantly to DTE were below detection and therefore the FMT, except for small amounts of TCDF. Concentrations of DTEh in suckers were 33% of the FTALc, but unlike in bass, DTEo were significant at 26% of the FTALc, due to significant levels of TCDF. The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. This station has been used as a reference station for the Presumpscot River since 1993 since there are no known point sources of dioxin upstream. However, concentrations of TCDD, TCDF, PeCDD, PeCDF and DTEh from this station have historically been significantly higher than all other reference stations in the program every year through 1998 (Table 3, Appendix 10). No samples were collected in 1999, and only bass were collected in 2000. DTEo concentrations in bass were lower in 2000 and 2001 than in previous years, but concentrations in suckers in 2001 are not. These results suggest that there are other local sources of dioxin which have not yet been discovered. These concentrations must represent a combination of background from local sources and long range transport and atmospheric deposition from remote sources.

Westbrook Five smallmouth bass and ten suckers (Appendix 7) were collected from the river near the US Route 302 bridge about 1.5 miles downstream of the discharge from SAPPI Westbrook's bleached kraft pulp and paper mill. In 1999 the pulp mill ceased operation and the paper mill now purchases its pulp. 2001 was the second year since then that fish have been monitored. Concentrations of DTEh in bass were 30% of the FTALc although DTE0 was only 6%, documenting the impact of treatment of non-detects (Appendix 2). Concentrations of all congeners that add significantly to DTE were below detection and therefore the FMT, except for small amounts of TCDF. Concentrations of DTEh in suckers were 42% of the FTALc, but unlike in bass, DTEo were significant at 25% of the FTALc, due to significant levels of TCDF. The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). There was no significant trend for the period 1997-2001 for either species, but data are limited. Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. There was no significant difference in TCDD, TCDF, or DTEh concentrations in bass between this station and the Windham station (Table 3). Sample size (n=2) for the suckers was too small to allow a meaningful statistical comparison; however, the mean concentrations were no higher at this station than at the station above for either species. Effluent and sludge data, taken within a few months of the cessation of the pulp mill in 1999 document reduced discharges from the mill (Appendix 3, 4), but there are no newer data.

Salmon Falls River

South Berwick- Four smallmouth bass (Appendix 7) were collected from the Rollinsford Impoundment about 2 miles below the discharge from the Berwick Sewer District's municipal wastewater treatment plant in Berwick, whose discharge is 85% effluent from Prime Tanning Company. DTEh were 52% of the FTALc all bass combined (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than in fish from previous years at an upstream reference station at Acton, which had concentrations similar to other reference stations in Maine (Table 3, Appendix 10). There was no significant trend for TCDD or DTEh in bass during the 1990s. There are no new sludge or effluent data from the treatment plant to show any changes in discharges. These results document a local source of dioxin to this reach of the river most likely the Prime Tanning discharge.

Sebasticook River

East Branch at Newport- Five smallmouth bass (Appendix 7) were collected from the river just above the County Road Bridge, a popular fishing spot at the inlet to Sebasticook Lake. This station is approximately 2 miles below the Corinna Sewer District discharge, 80% of which was from the Eastland Woolen Mill. This facility treated the waste from the Eastland Woolen Mill in Corinna until 1996, when the mill ceased operation. Since then groundwater and river sediments have been found to be contaminated with a number of pollutants from the mill including dioxin. The site was placed on the National Priorities List of Superfund sites in 1999, and cleanup has begun. This fish sampling was funded by Maine's SWAT monitoring program. Concentrations of DTEh were 61% the FTALc (Appendix 2). Total toxic equivalents (TTEh), the combination of DTEh and dioxin-like PCBS measured in DEP's SWAT program, may result in a further increase in toxic equivalents in these fish (DEP, 2000). Sources of PCBs are unknown but likely include the mill and/or long-range transport and atmospheric deposition. TCDD and DTEh concentrations were significantly lower than when last measured in 1997, but still significantly greater than in fish from the upstream station above the mill at Corinna measured in 1997 also (Table 3). These results document a local source of dioxin to this reach of the river, most likely residues from Eastland Woolen Mill. Measurable amounts of furan were found in sludge from the Corinna Sewer District for a number of years, although there are no new sludge data since 1996 and no effluent data to show any recent changes in discharge levels (Appendix 3).

East Branch at Detroit- Five smallmouth bass were collected from the river about 10 miles downstream of the Corinna Sewer District's discharge and 5 miles below Sebasticook Lake. This work was funded by Maine's SWAT monitoring program. Concentrations of DTEh were 40% of the FTALc (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2002). Sources of PCBs are unknown but likely include the mill and/or long-range transport and atmospheric deposition. Concentrations of TCDD were similar to those at the County Road Bridge above the lake but lower than those from fish within the lake sampled in 2000. All were sigificantly greater than those in fish from the reference site upstream of the discharge in Corinna in years past (Table 3, Appendix 10). DTEh were lower than those at the other two stations downstream of the mill but were significantly greater than the upstream reference site in past years. This site still shows contamination from the mill, although less so than upstream stations closer to the source.

West Branch at Palmyra Five smallmouth bass were collected from the river near the US Route 2 bridge about 3-4 miles below the discharge from the Town of Hartland, whose effluent is about 85% effluent from Irving Tanning Company, and combined into two samples of five fish each. Concentrations of DTEh were 51% of the FTALc (Appendix 2). The addition of dioxin-like (coplanar) PCBs, measured as part of DEP's SWAT program, to DTEh may result in total toxic equivalents (TTEh) that exceed a Fish Tissue Action Level in these fish (DEP, 2000). Sources of PCBs are unknown but likely include long-range transport and atmospheric deposition. Concentrations of TCDD and DTEh were significantly greater than in fish from the reference site upstream of the discharge in Great Moose Lake in years past (Table 3, Appendix 10). There were no significant trends for TCDD or DTEh during the 1990s. These results document a local source of dioxin to this reach of the river, most likely the Irving Tanning discharge. Although the only effluent sample result reported (1996) showed no detectable amount of dioxin in effluent (Appendix 4), low solubility and high bioconcentration of dioxin make effluent data less meaningful than sludge data. Sludge data from 1989 show measurable levels of TCDF (Appendix 3), but more recent data in 2000 show concentrations below reasonably low detection levels. If these recent data are representative of reduced discharges, concentrations in fish should decrease in the upcoming years, unless there is residual dioxin remaining in the system.

Above/Below Test

The goal in development of a suitably sensitive Above/Below test, is to be able to detect a minimum significant difference (MSD) in dioxin and/or furan concentrations above and below a mill as small as a target value of 10% of background or as small as possible. MSDs are normalized to mean concentrations above the discharge to provide a relative measure, since units and scales are different for different congeners, test types, species, and tissues. Where the concentrations above the mill are below the detection limit, as is the case for TCDD in muscle tissue, the MSD target is an absolute value (0.05-0.1 ppt) rather than a relative one.

Since the development of the Above/Below test began in 1997, tests of TCDD, TCDF, and DTEo on both a wet and lipid weight basis have been conducted in small bass, single and composite large bass filets, bass livers, large and small whole suckers, single and composite sucker filets, single and composite sucker livers, single and 2 composites of SPMDs, and caged mussels, for a total of 78 tests. Up through 2000, juvenile whole bass and/or mature legal sized bass filets showed the lowest MSDs for most samples, although sucker filets occasionally had the lowest MSDs. Consequently, all three were sampled at one or more stations as previously shown (Table 2).

<u>Bass</u>

Ten mature legal sized bass were captured at one pair of stations on each of the Androscoggin (ARY at Riley above and ALV at Livermore Falls below the International Paper Company mill in Jay), Kennebec (KNW at Norridgewock above and KFF at Fairfield below the SAPPI Somerset mill), and Penobscot (PBW at Woodville above and PBL at S Lincoln below Lincoln Pulp and Paper in Lincoln) rivers, essentially repeating studies conducted in 2000. All bass were to be within a 25 mm length range within and between paired stations, which was achieved for the Androscoggin and Penobscot river samples. Due to difficulty in collecting fish, the fish from the Kennebec were within 60 mm, rather than 25 mm, of each other within each station, but the range was similar between stations. (Appendix 7). All bass were analyzed as individuals.

Concentrations of TCDD and TCDF on both a wet weight and lipid weight basis and DTEh on a lipid weight basis were significantly higher at Livermore Falls below than at Riley above the mill on the Androscoggin River (Appendix 2). MSDs were normalized to the mean concentrations of Norridgewock and Woodville since both staions are downstream of the MeadWestvaco mill in Rumford. MSDs (Table 4) were generally similar to those from 2000 at the Rumford Point-Rumford A/B stations. MSDs were lower for lipid weights than for wet weights, but none were close to the target values.

Concentrations of TCDD and DTEo on both wet and lipid weight basis and TCDF on a lipid weight basis were all significantly higher at Fairfield below than at Norridgewock above the mill on the Kennebec River as in all previous years (Appendix 2). MSDs (Table 4) were generally lower than those in 2000. MSDs were closest to targets for TCDF followed by DTEo then TCDD, and lipid weight based MSDs were lower than wet weight MSDs, although not by much. MSDs were lower than those from the Androscoggin. None of the MSDs met target values, however.

Concentrations of TCDD and DTEo for both wet and lipid and weights and TCDF for wet weight were significantly higher at South Lincoln below than at Woodville above the mill on the Penobscot River (Appendix 2). MSDs (Table 4) were generally higher than in 2000 except for TCDF on a lipid basis. Lipid weight MSDs were lower than wet weight MSDs. Wet weight MSDs were intermediate those from the other two rivers, but lipid weight MSDs were closer to those from the Kennebec. None of the MSDs met target values, however.

Small Bass

Since small fish of a given species at a station are younger than much larger fish, they generally have lower body burdens of contaminants such as dioxin. In addition, younger fish generally have higher growth rates and uptake of contaminants that may reflect current ambient contaminant levels better than older fish that may have residues from years past. And small fish tend to have smaller home ranges, therefore may be more representative of local conditions than larger fish which may move to different areas within the year. All of these may result in less variation in concentrations and decrease MSDs.

To examine this proposition, in 1999 we collected small suckers from the Kennebec River at Norridgewock (KNW)and Fairfield (KFF). Interestingly, MSDs were higher for the small suckers than for the larger suckers for TCDD, TCDF, and DTEo both on a wet and lipid weight basis. Since, in studies conducted beginning in 1997, MSDs were often lower for large bass than for large suckers, in 2000, small bass, rather than small suckers, were collected from these same stations (Appendix 7). Results were mixed with small bass giving lower MSDs for some measures but not for others.

The study was repeated in 2001. Small (juvenile) smallmouth bass were collected from Riley and Livermore Falls, the same stations on the Androscoggin River as were the mature bass. Concentrations of TCDD and DTEo were significantly higher at Riley, above the mill, than at Livermore Falls below the mill, on a lipid weight basis, but there were no other differences between stations. This may have been the result of the fact that the fish at Riley were, however, significantly larger than those captured at Livermore Falls. This is the opposite from that observed on the Kennebec in 2000, where concentrations in small bass below the mill were significantly higher than in fish above the mill for all measures. The 2001 Androscoggin River juvenile bass MSDs were slightly lower than those for large bass for TCDD, TCDF and DTEo (Table 4). Lipid normalized values were lower than wet weight values. MSDs were lower on a wet weight basis and higher on a lipid weight basis than those in small bass from the Kennebec in 2000. Nevertheless, MSDs were still much higher than the targets.

Table 4. Minimum Significant Differences for 2001 Above/Below Tests

STATIONS	SPECIES	N	TCDDw		TCDFw		DTEow		TCDDL		TCDFL		DTEoL	
			ppt	%bg	ppt	%bg	ppt	%bg	ppt	%bg	ppt	%bg	ppt	%bg
FISH														
ARY/ALV	SMB	10	0.19	**380**	2.22	**308.3**	0.59	**590**	13.42	**133**	169	**141**	28	**162**
		20	0.14	**280**	1.57	**218.1**	0.42	**420**	9.49	**94**	120	**100**	19.7	**114**
	sSMB	10	0.16	**320**	2.09	**290.3**	0.37	**370**	4.75	**47**	155	**129**	17	**98**
		20	0.12	**240**	1.48	**205.6**	0.26	**260**	3.36	**33**	109	**91**	12	**69**
	WHS	10	0.1	**200**	4.04	**918.2**	0.75	**1071**	2.9	**106**	35.5	**159**	9	**265**
		20	0.07	**140**	2.86	**650**	0.53	**757**	2.05	**75**	25.1	**113**	6.7	**197**
KNW/KFF	BNT	5	1.08	**2160**	1.65	**471.4**	1.25	**1786**	19.5	**1140**	29.7	**263**	21.6	**1014**
		10	0.76	**1520**	1.17	**334.3**	0.89	**1271**	13.8	**807**	21	**186**	15.3	**718**
	SMB	10	0.08	**160**	0.55	**63**	0.12	**120**	12	**151**	40.1	**34**	12.6	**94**
		20	0.06	**120**	0.39	**45**	0.09	**90**	8.45	**106**	28.4	**24**	8.9	**66**
	WHS	10	0.12	**240**	0.59	**140.5**	0.19	**380**	2.42	**86**	12.7	**60**	3.4	**142**
		20	0.08	**160**	0.42	**100**	0.14	**280**	1.71	**61**	9	**42**	2.4	**100**
PBW/PBL	SMB	10	0.14	**280**	0.47	**81.03**	0.18	**164**	16.3	**133**	61.6	**50**	15	**71**
		20	0.1	**200**	0.33	**57**	0.13	**118**	11.5	**93**	43.6	**35**	10.5	**50**
	WHS	10	0.15	**300**	0.65	**144.4**	0.24	**267**	1.37	**51**	12.3	**54**	1.74	**39**
		20	0.1	**200**	0.46	**102.2**	0.17	**189**	0.97	**36**	8.7	**38**	1.23	**28**
PBC/PBV	SMB	5	0.19	**380**	0.54	**93**	0.26	**236**	16.3	**133**	178	**145**	33.6	**158**
		10	0.14	**280**	0.38	**66**	0.18	**164**	11.5	**94**	126	**102**	23.8	**112**
PWD/PWB	SMB	5			0.54	**81**	0.09	**90**	38.7	**235**	259	**124**	30.5	**96**
		10			0.38	**57**	0.07	**70**	27.4	**166**	183	**88**	21.6	**68**
mean	**SMB**	**10**	0.14	**275**	0.80	**115**	0.23	**221**	16.12	**135**	115.94	**83**	20.20	**101**
		20	0.10	**200**	0.76	**107**	0.21	**209**	9.81	**98**	64.00	**53**	13.03	**77**
	sSMB	**10**	0.16	**320**	2.09	**290.3**	0.37	**370**	4.75	**47**	155	**129**	17	**98**
		20	0.12	**240**	1.48	**205.6**	0.26	**260**	3.36	**33**	109	**91**	12	**69**
	WHS	**10**	0.12	**247**	2	**401**	0	**573**	2	**81**	20	**91**	5	**148**
		20	0.08	**167**	1	**284**	0	**409**	2	**57**	14	**64**	3	**108**

Suckers

At the same pair of stations on the Androscoggin River, namely Riley and Livermore Falls, 20 mature male suckers were captured and the filets combined into 10 composites of 2 fish each. All suckers were within a 50 mm length range within and between stations (Appendix 7). Concentrations of TCDF on both a wet and lipid weight basis and DTEo on a lipid weight basis were significantly higher in fish at Riley above the mill than at Livermore Falls below the mill, (Appendix 2). MSDs were lowest for TCDF, followed by TCDD, and then DTEo in order (Table 4). MSDs were lower for TCDD but higher for TCDF and DTEo on both a wet and lipid weight basis than in bass. Lipid weight based MSDs were lower than wet weight MSDs, but no MSDs were close to the goal.

From the Norridgewock and Fairfield stations on the Kennebec, ten suckers were captured and the filets analyzed individually. All suckers were within a 50 mm length range within and between stations (Appendix 7). Concentrations of TCDD, TCDF, and DTEo were significantly higher at Fairfield below the mill than at Norridgewock above the mill. MSDs were lowest for TCDF, followed by TCDD, and then DTEo in order and lower on a lipid weight basis than on a wet weight basis (Table 4). MSDs were higher than in bass except for TCDD on a lipid weight basis. MSDs were lower than those for fish from this site in 2000. No MSDs were close to the goal.

Ten large suckers were captured from the Penobscot River at Woodville (PBW) above and at S Lincoln (PBL) below Lincoln Pulp and Paper in Lincoln. All suckers were within a 25 mm length range within and between stations (Appendix 7). All were analyzed as filets. Concentrations of TCDD, TCDF, and DTEo were significantly higher at South Lincoln than at Woodville on a wet and lipid weight basis. MSDs were lowest for TCDF on a wet weight basis but for DTEo on a lipid weight basis and lower on a lipid weight basis overall (Table 4). MSDs were higher than in bass except for TCDD and DTEo on a lipid weight basis. MSDs were also higher than in suckers from the Kennebec except for TCDD and DTEo on a lipid weight basis. MSDs were lower than in this river on 2000, but still not close to the target values.

SPMDs (SEMI-PERMEABLE MEMBRANE DEVICES)

Semipermeable membrane devices (SPMDs) are passive integrative sampling devices which combine membrane diffusion and liquid-liquid partitioning to concentrate low to moderate molecular mass hydrophobic compounds from water (Huckins et al, 1996). Made of low-density polyethylene lay-flat tubing (2.5 cm wide by 91.4 cm long), containing a thin film of neutral triolein and placed inside stainless steel canisters, SPMDs are deployed in the waterbody where they accumulate contaminants until retrieved.

SPMDs have some features that give them advantages over monitoring contaminants in fish. SPMDs can be deployed in water to accumulate single, pulsed, or continuous contaminant releases over time. SPMDs are anchored to sample at specific locations, thereby avoiding any question of origin of contaminants caused by fish movement. SPMDs do not change function under stress, unlike gills of fish. There are no biotransformations or elimination like that in fish. And accumulation of contaminants does not occur by the same process of uptake in fish, thereby potentially limiting their use to accumulation in a relative sense. When deployed in Maine Rivers for approximately a month, SPMDs are able to sequester enough dioxin/furans for quantification by HRGC/HRMS (Shoven, 2001). SPMD uptake rates have been determined for dioxin/furans in order to calculate dissolved water concentrations (Rantalainen et al, 2000).

There are, however, a number of environmental factors, such as water temperature, biofouling, dissolved organic carbon (DOC), suspended solids, and flow velocity that affect the uptake kinetics of SPMDs. Assuming isotropic exchange kinetics, permeability reference compounds (PRCs) can be added to the SPMD prior to deployment to calibrate the rate change of dioxin/furan uptake caused by environmental conditions (Huckins et al., 2002)

In order to assess the potential of SPMDs to determine if mills are discharging dioxin, DEP has funded studies at the University of Maine Environmental Chemistry Laboratory (formerly the Water Research Institute) since 1999 through the Surface Water Ambient Toxics (SWAT) program. In 1999, the focus was development and refinement of field and laboratory techniques by deploying the SPMDs in the nearby Penobscot River for 3 one-month trials and then retrieving them for laboratory analysis. In 2000, two deployments were made in the Androscoggin River to investigate the effect of time and duration of deployment on biofouling. An above/below trial was also made in both the Androscoggin and Kennebec rivers.

2001

In 2001 the goals were as follows:

1. Validate the deployment scheme and analytical method developed in 2000.
2. Increase the sample size for more statistical power.
3. Decrease the variability between samples to lower the minimal statistical difference and improve the sensitivity of the A/B test.
4. Compare the results from 2000 with 2001.

Site Location

The SPMD field deployments for 2001 were above and below the MeadWestvaco Mill in Rumford from 7/13/01 to 8/10/01 and the International Paper Mill in Jay from 9/22/01 to 10/20/01 on the Androscoggin River. The GPS determined latitude-longitudes for the sites were:

Site	Latitude (DegMinSec)	Longitude (DegMinSec)
Upstream Rumford	N44*31'04"	W70*33'05"
Downstream Rumford	N44*30'10.5"	W70*23'53.3"
Upstream Jay	N44*28'42.4"	W70*16'18.7"
Downstream Jay	N44*29'06.2"	W70*12'13.8"

The Rumford site was chosen to compare the SPMD results from 2001 with those from 2000 at that site. Originally, both 2001 deployments were going to be at the Rumford site. However, due to a shutdown of the MeadWestvaco mill in September, the second deployment was downstream above and below the International Paper mill at Jay. The below sites were a sufficient distance below the mills to ensure proper mixing of the effluent so the dioxin/furans river concentrations were assumed to be at equilibrium.

Deployment Scheme

The Rumford deployment scheme used an elaborate system of surface buoys, ropes and anchors to submerge the SPMD-filled canisters (Shoven, 2001). The system was developed so the canisters would remain approximately 3 feet under the water surface regardless of the water level making sure the canisters avoided contact with the sediment. The deployment consisted of 40 SPMDs in 8 canisters submerged by two buoy systems at each site. Upon retrieval of the SPMDs, one buoy system at the upstream site had been vandalized by one of the buoys being punctured. Those 20 SPMDs had been resting on the bottom for an unknown amount of time. Due to the difficulties at Rumford, the deployment scheme was changed for Jay. In an effort to avoid vandalism, submerged milk jugs were used as floats to keep the canisters upright at ~10 feet above the sediment with a water depth of ~15 feet. There were four sets of submerged milk jugs with two canisters and 10 SPMDs at each site. No vandalism occurred. However, at the upstream site, 3 sets of milk jugs lost buoyancy and six canisters with 30 SPMDs were found near the sediment. The sediment at this site was sand and gravel; therefore, there was probably no contamination of dioxin from the sediments. For each site, appropriate measures were taken to ensure no contamination during transport, deployment, and retrieval. Also, attached to one canister at each site was a HOBO temperature logger to monitor the hourly water temperature throughout the deployment.

Laboratory Methods

All SPMDs and deployment canisters are purchased from Environmental Sampling Technologies, St. Joseph, MO. All standards are purchased from Cambridge Isotope Laboratories, Andover, MA. All solvents are GC-resolve grade.

The Rumford samples were analyzed according to the 2000 procedural method (Shoven, 2001). The procedure consisted of external washing of the SPMD to remove any periphytic growth followed by an injection of carbon-labeled dioxin/furan and PCB standards to accurately quantify the congeners using the isotope dilution method outlined in EPA Method 1613 (Telliard, 1994). After spiking and drying, the samples underwent a two-stage 24 hour dialysis with 150 ml of hexane at sub-ambient temperatures (~18 C). The dialysates of two SPMDs were then combined into one composite sample to make an N=20 composite samples for each site. The samples were cleaned up using acidified silica gel slurry to hydrolyze any remaining lipid after dialysis. Gel permeation chromatography (GPC) was then used as a further clean up before quantification by HRGC/HRMS. Quality control samples consisted of a trip blank for each site, a lab dialysis blank, a lab matrix spike, and a lab procedural blank. Water samples were collected at the beginning and end of each deployment to measure total organic carbon (TOC), dissolved organic carbon (DOC), and specific conductivity.

Due to preliminary results from Rumford, the Jay samples were analyzed differently. The chromatograms for the Rumford deployment had numerous interferents causing quantification problems such as concentration over-estimation or, conversely, non-detection. The physical clean up and the two-stage 24 hour dialysis remained the same. However, the dialysates were combined into composite samples of 5 SPMDs each resulting in an N=8 for each site. Also, the PCB standards were not injected because PCBs are a known interferent during dioxin/furan quantification. The same acidified silica gel slurry and GPC method were performed on the samples, but a fractionation with ENVI-carb reversible tubes from Supelco, Bellafonte, PA was utilized to ensure a better clean up of the samples. The same quality control was performed for the Jay samples.

Results

The results from the 2001 field season were calculated as nanogram of dioxin/furan per kilogram of SPMD. Estimated dissolved dioxin/furan concentrations in the river have yet to be determined for each of the sites. The coefficient of variation (CV) for the Rumford deployment ranged from 29 to 368% with an average of 92% for all the congeners. The Rumford data are not yet completed (12 of the 40 still have not been quantified). Most of the variation from Rumford originates from an ineffective clean up procedure and laboratory inexperience. The CV for the

Jay deployment ranged from 9 to 115% with an average of 42%. However, after removing one statistical outlier (> 2 standard deviations from the mean) from the upstream data and two downstream samples that didn't satisfy EPA Method 1613 quality assurance, the CV ranged from 6% to 38% with an average of 18%. Both data sets have a co-eluting peak with 2,3,7,8-TCDD leading to quantification problems for that congener. The toxic equivalency values (DTE) were determined using the World Health Organization's toxic equivalency factors for mammals.

Concentrations of most congeners were lower below the mills than above (Figures 1 and 2). The comparison between the 2000 and 2001 Rumford deployments show distinct similarities in congener profile for the population of samples with the exception of less non-detections in the 2001 data. However, with the amount of variability present in each set of samples, more validation is needed for that site.

Objectives for 2002

1. Reduce the variability between replicates to facilitate development of a more sensitive A/B test. A coefficient of variation of ~20% is expected.

2. Use PRCs as an *in situ* calibration for varying environmental conditions such as water velocity, temperature, and biofouling.

3. Develop a deployment scheme to eliminate possible vandalism and other logistical problems.

4. Perform a method detection limit study with composites of 4 SPMDs.

Conclusions

Of all the test types (large and small bass, large sucker filets and whole fish, sucker liver composites, freshwater mussels, and SPMDs) tested since 1997, only the fish and livers were able to detect significant differences between stations above and below some bleached kraft pulp and paper mills. MSDs were generally lower for mature or juvenile bass or for suckers depending on station, contaminant and year, but none have attained or consistently approached the goal of an MSD of 10% of background concentrations. SPMDs have not performed as well as fish, but new sampling design and cleanup techniques promise better results. These devices will be tested again along with fish in 2002.

Figure 1. DTE values for 2001 deployments.

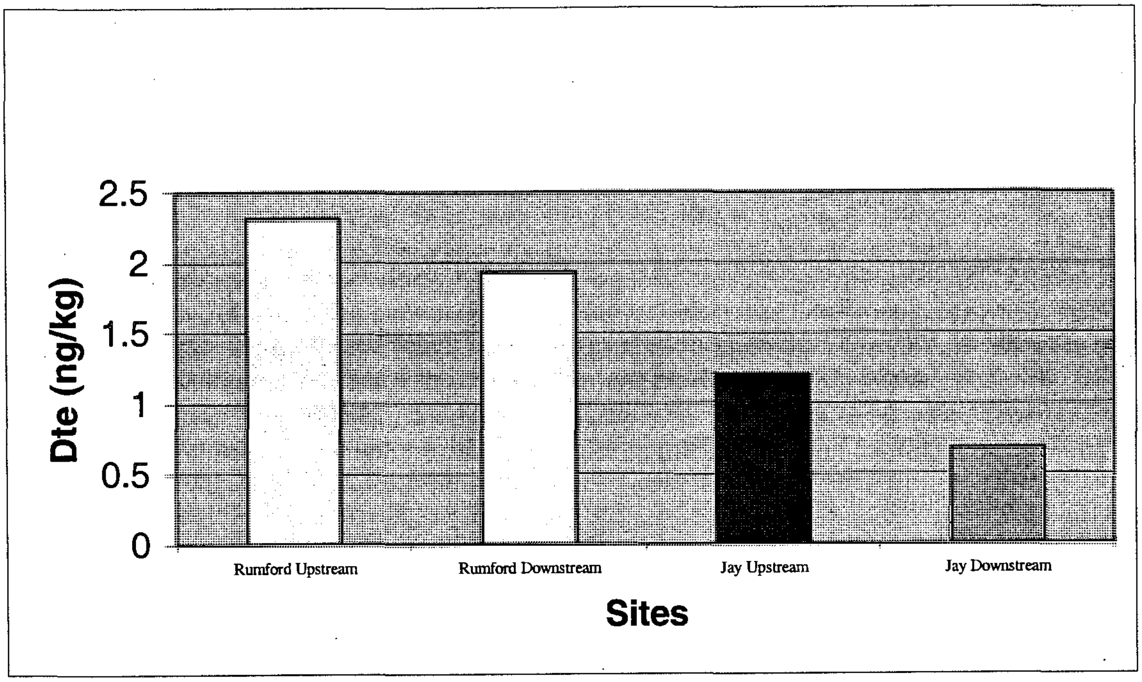
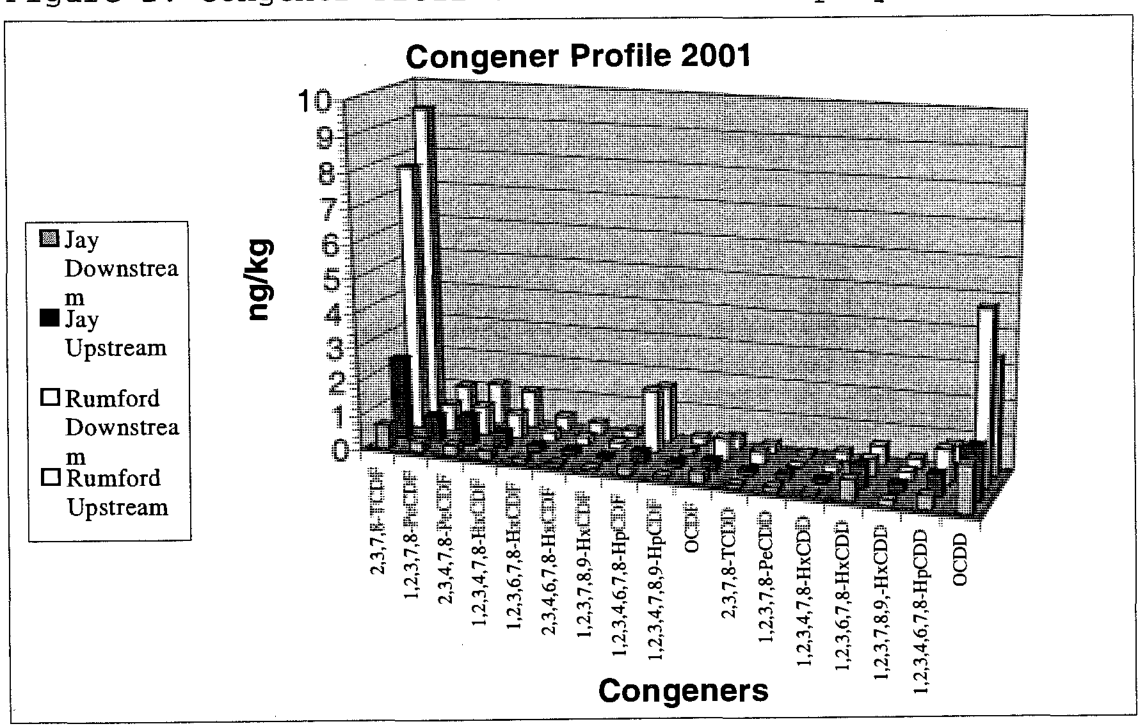


Figure 2. Congener Profile for the 2001 deployments.



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APPENDIX 1

MAINE BUREAU OF HEALTH

FISH CONSUMPTION ADVISORY, AUGUST 2000

LOBSTER TOMALLEY CONSUMPTION ADVISORY, 2 FEBRUARY 1994

The Year 2000 Freshwater Fish Consumption Advisories (109K) UPDATED

The Year 2000 Marine Fish and Shellfish Consumption Advisory (104K) UPDATED

Mercury in Fish Brochure (1,451 K) UPDATED

Safe Eating Guidelines Chart (219 K) UPDATED

Know the Mercury Levels in the Fish You Eat UPDATED

Fish Preparation Methods to Reduce Risk (264K)

Interactive Map of the Fish Consumption Advisories UPDATED

Warnings on Eating Fish Caught in Maine Waters

The Bureau of Health is responsible for recommending the warnings on eating fish based on the presence of chemicals (MSRA 22 § 1696 I).

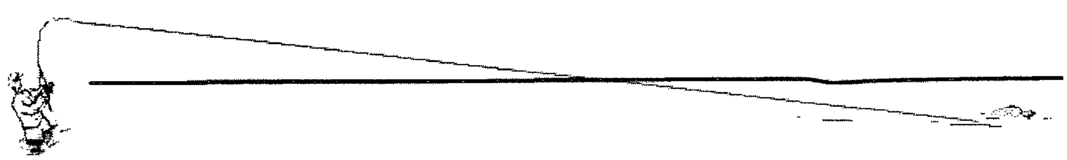
Fish is Good for You and Your Family if you follow the Eating Guidelines

Fish is good for you and your family. It is a low fat source of protein that is rich in nutrients. Studies have shown that eating fish regularly (such as once per week) can reduce the chance of death from a heart attack. The American Heart Association recommends people eat fish regularly. Fish is also one of the few foods that are rich in the 3-omega fatty acids needed for proper development of the brain and nervous system in the unborn fetus and infants. So be sure to include fish in your

But some fish have chemicals in them that may be harmful if you eat too much. T of Health issues eating guidelines for fish (called "Fish Consumption Advisories") Maine waters so you can still get the health benefits of eating fish by choosing safe fish, safer places to catch fish, safer ways to prepare fish, and limiting how much c you eat.

Click HERE to request a copy of the fish consumption advisories.

Our website makes extensive use of Acrobat ( ) files. Click here Get Acrobat Reader anc the directions to download your FREE Adobe Acrobat Reader.



Procedures for Setting Fish Consumption Guidelines SOON TO COME!

Bureau of Health Home Page

Environmental Toxicology Program Home Page

State of Maine Home Page

Last Updated: 08/30/01

WARNING ABOUT EATING FRESHWATER FISH

***Warning:* Mercury in Maine freshwater fish may harm the babies of pregnant and nursing mothers, and young children.**

SAFE EATING GUIDELINES

- **Pregnant and nursing women, women who may get pregnant, and children under age 8** SHOULD NOT EAT any freshwater fish from Maine's inland waters. Except, for brook trout and landlocked salmon, 1 meal per month is safe.

- **All other adults and children older than 8** CAN EAT 2 freshwater fish meals per month. For brook trout and landlocked salmon, the limit is 1 meal per week.

It's hard to believe that fish that looks, smells, and tastes fine may not be safe to eat. But the truth is that fish in Maine lakes, ponds, and rivers have mercury in them. Other states have this problem too. Mercury in the air settles into the waters. It then builds up in fish. For this reason, older fish have higher levels of mercury than younger fish. Fish (like pickerel and bass) that eat other fish have the highest mercury levels.

Small amounts of mercury can harm a brain starting to form or grow. That is why unborn and nursing babies, and young children are most at risk. Too much mercury can affect behavior and learning. Mercury can harm older children and adults, but it takes larger amounts. It may cause numbness in hands and feet or changes in vision. The Safe Eating Guidelines identify limits to protect everyone.

***Warning:* Some Maine waters are polluted, requiring <u>additional</u> limits to eating fish.**

Fish caught in some Maine waters have high levels of PCBs, Dioxins or DDT in them. These chemicals can cause cancer and other health effects. The Bureau of Health recommends <u>additional</u> fish consumption limits on the waters listed below. <u>Remember</u> to check the mercury guidelines. If the water you are fishing is listed below, check the mercury guideline above and follow the most limiting guidelines.

SAFE EATING GUIDELINES

Androscoggin River Gilead to Merrymeeting Bay:---------- **6-12** fish meals a year.
Dennys River Meddybemps Lake to Dead Stream:---------- **1-2** fish meals a month.
Green Pond, Chapman Pit, & Greenlaw Brook
(Limestone):----------**Do not eat any fish from these waters.**
Little Madawaska River & tributaries
(Madwaska Dam to Grimes Mill Road):----------**Do not eat any fish from these waters.**
Kennebec River Augusta to the Chops:----------**Do not eat any fish from these waters.**
Shawmut Dam in Fairfield to Augusta:------ **5** trout meals a year, **1-2** bass meals a month.
Madison to Fairfield: ---------- **1-2** fish meals a month.
Meduxnekeag River: ---------- **2** fish meals a month.
North Branch Presque Isle River---------- **2** fish meals a month.
Penobscot River below Lincoln:---------- **1-2** fish meals a month
Prestile Stream:---------- **1** fish meal a month.
Red Brook in Scarborough: ---------- **6** fish meals a year.
Salmon Falls River below Berwick: ---------- **6-12** fish meals a year.
Sebasticook River (East Branch, West Branch & Main Stem)
(Corinna/Hartland to Winslow):----------**2** fish meals a month.

For more details, including warnings on striped bass, bluefish and lobster tomalley call (207)-287-6455 or visit our web site at janus.state.me.us/dhs/bohetp/index.html

Revised August 29, 2000
Environmental Toxicology Program
Maine Bureau of Health

APPENDIX 2

DIOXIN AND FURAN CONCENTRATIONS IN 2001 FISH SAMPLES

CODES	STATIONS
AGL	ANDROSCOGGIN RIVER AT GILEAD
ARP	ANDROSCOGGIN RIVER BELOW GILEAD AT RUMFORD POINT
ARF	ANDROSCOGGIN RIVER BELOW RUMFORD
ARY	ANDROSCOGGIN RIVER AT RILEY
ALV	ANDROSCOGGIN RIVER AT LIVERMORE FALLS
AGI	ANDROSCOGGIN RIVER AT GULF ISLAND POND, AUBURN
ALS	ANDROSCOGGIN RIVER AT LISBON FALLS
ALW	ANDROSCOGGIN LAKE AT WAYNE
KMD	KENNEBEC RIVER AT MADISON
KNW	KENNEBEC RIVER AT NORRIDGEWOCK
KFF	KENNEBEC RIVER AT SHAWMUT, FAIRFIELD
KSD	KENNEBEC RIVER AT SIDNEY
KAG	KENNEBEC RIVER AT AUGUSTA
PBG	PENOBSCOT RIVER AT GRINDSTONE
PBR	PENOBSCOT RIVER W BR AT EAST MILLINOCKET
PBW	PENOBSCOT RIVER AT WOODVILLE
PBM(PBN)	PENOBSCOT RIVER AT WINN
PBL	PENOBSCOT RIVER AT SOUTH LINCOLN
PBC	PENOBSCOT RIVER AT MILFORD
PBV	PENOBSCOT RIVER AT VEAZIE
PBB	PENOBSCOT RIVER BELOW BANGOR AT ORRINGTON
PWD	PRESUMPSCOT RIVER AT WINDHAM
PWB	PRESUMPSCOT RIVER AT WESTBROOK
SFA	SALMON FALLS RIVER AT ACTON
SFS	SALMON FALLS RIVER AT SOUTH BERWICK
SEC	SEBASTICOOK RIVER E BR AT CORINNA
SEN	SEBASTICOOK RIVER E BR AT NEWPORT
SLN	SEBASTICOOK RIVER AT NEWPORT
SWH	SEBASTICOOK RIVER W BR AT HARTLAND
SWP	SEBASTICOOK RIVER W BR AT PALMYRA
SCW	ST CROIX RIVER AT WOODLAND
SCB	ST CROIX RIVER AT BARING

SPECIES

BNT	BROWN TROUT
CHP	CHAIN PICKEREL
LMB	LARGEMOUTH BASS
SMB	SMALLMOUTH BASS
WHP	WHITE PERCH
WHS	WHITE SUCKER

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		AGL-RBT-01	AGL-RBT-02	AGL-RBT-03	AGL-RBT-04	AGL-RBT	AGL-BNT-01	ARP-SMB-01	ARP-SMB-02	ARP-SMB-03
WRI ID		01-001	01-002	01-003	01-004	AVE	01-005	01-216	01-217	01-218
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	7.58	10.3	9.55	8.82	9.06	10.5	3.01	4.21	4.89
12378-pecdf	0.25	2.06	3.61	2.57	1.84	2.52	2.66	<DL	<DL	<DL
23478-pecdf	0.25	<DL	0.61	0.75	0.57	0.64	0.61	0.25	0.41	0.57
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	0.33	0.38	0.24	0.32	0.35	<DL	0.22	0.34
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	0.57	0.42	0.33	0.44	0.62	<DL	<DL	0.31
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	0.74	0.59	0.51	0.61	1.02	0.51	0.89	1.03
2378-tcdd	0.10	0.68	0.91	0.78	0.75	0.78	0.81	0.19	0.35	0.41
12378-pecdd	0.25	<DL	0.12	<DL	<DL	0.12	0.15	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	1.26	0.87	0.66	0.93	0.75	<DL	<DL	<DL
ocdd	0.50	1.25	2.84	2.26	1.48	1.96	3.25	1.02	2.07	2.65
DTEo		1.541	2.597	2.290	2.043	2.12	2.497	0.616	0.998	1.221
DTEd		2.106	2.752	2.695	2.448	2.50	2.652	1.069	1.426	1.644
DTEh		1.82	2.67	2.49	2.25	2.31	2.57	0.84	1.21	1.43
DTEh sd						0.37				
DTEh Confidence						0.36				
DTEh 95 UCL						**2.67**	**2.57**			
	% FTAL					**178**	**171**			
% Lipids		1.96	3.61	3.06	2.19	2.70	10.22	0.69	1.40	1.83
Sample weight (g)		50.1	50.0	50.1	50.0		50.0	50.1	50.1	50.1

** For sample weights below 40 grams the detection limits must be adjusted accordingly.

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ARP-SMB-04	ARP-SMB-05	ARP-SMB	ARP-WHS-C1	ARP-WHS-C2	ARP-WHS	ARF-SMB-01	ARF-SMB-02	ARF-SMB-03
WRI ID		01-219	01-220	AVE	01-265-C1	01-261-C2	AVE	01-011	01-012	01-013
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	6.25	2.74	4.22	4.21	3.52	3.87	1.06	0.80	2.16
12378-pecdf	0.25	<DL	<DL	#DIV/0!	0.26	0.21	0.24	0.28	0.31	0.35
23478-pecdf	0.25	0.65	0.22	0.42	0.31	0.28	0.30	0.35	<DL	0.19
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdf	0.25	0.29	<DL	0.28	0.22	<DL	0.22	0.32	<DL	0.29
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdf	0.50	0.42	<DL	0.37	0.37	0.29	0.33	0.30	0.21	0.36
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdf	0.50	0.87	0.55	0.77	0.15	0.11	0.13	<DL	<DL	<DL
2378-tcdd	0.10	0.48	0.15	0.32	0.11	0.09	0.10	0.29	0.28	0.24
12378-pecdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	0.29
1234678-hpcdd	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdd	0.50	2.74	0.99	1.89	1.61	1.42	1.52	0.29	1.91	0.25
DTEo		1.464	0.534	0.97	0.725	0.596	0.66	0.620	0.378	0.630
DTEd		1.886	0.987	1.40	1.135	1.031	1.08	1.030	0.938	1.015
DTEh		1.67	0.76	1.18	0.93	0.81	0.87	0.83	0.66	0.82
DTEh sd				0.39			0.08			
DTEh Confidence				0.34			0.11			
DTEh 95 UCL				**1.52**			**0.99**			
	% FTAL			**102**			**66**			
% Lipids		2.32	0.58	1.36	2.49	1.85	2.17	1.23	0.70	1.12
Sample weight (g)		50	50.1		50.0	50.1		50.0	50.1	50.0

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ARF-SMB-04	ARF-SMB-05	ARF-SMB	ARF-WHS-C1	ARF-WHS-C2	ARF-WHS	ARY SMB-01	ARY SMB-02	ARY SMB-03
WRI ID		01-014	01-015	AVE	01-016-C1	01-017-C2	AVE	01-041	01-042	01-043
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	1.85	1.18	1.41	11.9	11.7	11.80	2.58	1.28	1.35
12378-pecdf	0.25	0.21	0.48	0.33	0.56	0.45	0.51	<DL	<DL	<DL
23478-pecdf	0.25	0.31	0.42	0.32	0.71	0.93	0.82	0.59	0.31	0.44
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdf	0.25	0.25	0.42	0.32	0.53	0.35	0.44	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdf	0.50	0.47	0.39	0.35	0.73	0.90	0.82	1.06	0.75	0.54
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	#DIV/0!	0.37	<DL	0.37	<DL	<DL	<DL
2378-tcdd	0.10	0.16	0.15	0.22	0.20	0.33	0.27	0.12	0.10	0.13
12378-pecdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	0.15	0.14	0.17
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	0.29	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	#DIV/0!	1.58	1.44	1.51	<DL	<DL	<DL
ocdd	0.50	0.22	0.29	0.59	1.55	1.70	1.63	2.25	1.35	1.06
DTEo		0.540	0.548	0.54	1.849	2.046	1.95	0.834	0.531	0.661
DTEd		0.950	0.958	0.98	2.254	2.451	2.35	1.031	0.728	0.858
DTEh		0.75	0.75	0.76	2.05	2.25	2.15	0.93	0.63	0.76
DTEh sd				0.07			0.14			
DTEh Confidence				0.06			0.19			
DTEh 95 UCL				**0.82**			**2.34**			
% FTAL				**55**			**45**			
% Lipids		1.19	1.62	1.17	12.88	12.42	12.65	1.23	0.61	1.09
Sample weight (g)		50.1	50.0		50.1	50.1		50.1	50.1	50.1

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ARY SMB-04	ARY SMB-05	ARY SMB-06	ARY SMB-07	ARY SMB-08	ARY SMB-09	ARY SMB-10	ARY SMB
WRI ID		01-044	01-045	01-046	01-047	01-048	01-049	01-050	AVE
Compound	**DL (ng/Kg)**								
2378-tcdf	0.11	3.06	2.84	1.65	1.48	1.96	2.21	2.57	2.10
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
23478-pecdf	0.25	0.52	0.47	0.31	0.38	0.52	0.49	0.44	0.45
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdf	0.50	0.84	0.72	0.41	0.67	0.59	0.82	1.01	0.74
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
2378-tcdd	0.10	0.29	0.24	0.16	0.19	0.21	0.19	0.22	0.19
12378-pecdd	0.25	0.25	0.22	0.15	0.14	0.17	0.19	0.17	0.18
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
ocdd	0.50	0.99	1.15	0.787	0.94	0.61	1.06	1.24	1.14
DTEo		1.114	0.986	0.634	0.675	0.842	0.854	0.877	0.80
DTEd		1.312	1.184	0.832	0.872	1.040	1.052	1.074	1.00
DTEh		1.21	1.09	0.73	0.77	0.94	0.95	0.98	0.90
DTEh sd									0.18
DTEh Confidence									0.11
DTEh 95 UCL									**1.01**
% FTAL									**67**
% Lipids		1.73	1.57	0.76	0.73	0.87	0.77	0.90	1.03
Sample weight (g)		50.1	50.1	50.0	50.0	50.1	50.0	50.0	

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ARY-SSMB-01	ARY-SSMB-02	ARY-SSMB-03	ARY-SSMB-04	ARY-SSMB-05	ARY-SSMB-06	ARY-SSMB-07	ARY-SSMB-08
WRI ID		01-400	01-401	01-402	01-403	01-404	01-405	01-406	01-407
Compound	**DL (ng/Kg)**	**		**	**		**	**	**
2378-tcdf	0.11	3.15	5.01	1.98	2.07	4.85	2.15	1.21	2.79
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.85	1.65	0.52	0.66	1.21	0.56	0.49	0.69
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	0.16	0.28	<DL	<DL	0.31	0.15	0.11	0.17
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.79	1.06	0.55	<DL	1.22	0.72	0.64	0.62
ocdd	0.50	2.07	3.37	1.21	0.65	3.04	1.86	0.56	1.54
DTEo		0.492	0.808	0.209	0.214	0.820	0.378	0.242	0.462
DTEd		1.627	1.376	2.211	2.231	1.387	1.513	1.377	1.597
DTEh		1.06	1.09	1.21	1.22	1.10	0.95	0.81	1.03
DTEh sd									
DTEh Confidence									
DTEh 95 UCL									
	% FTAL								
% Lipids		1.84	2.69	0.49	1.71	4.01	2.64	2.25	4.09
Sample weight (g)		22.3	46.8	14.4	16.7	50.0	21.9	19.8	22.2

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ARY-SSMB-09	ARY-SSMB-10	ARY-SSMB	ARY-WHS-C1	ARY-WHS-C2	ARY-WHS-C3	ARY-WHS-C4	ARY-WHS-C5
WRI ID		01-408	01-409	AVE	01-377-C1	01-378-C2	01-385-C3	01-385-C4	01-385-C5
Compound	**DL (ng/Kg)**	**	**						
2378-tcdf	0.11	0.99	1.45	2.57	8.85	13.6	6.16	7.26	6.98
12378-pecdf	0.25	<DL	<DL	#DIV/0!	0.33	0.57	0.25	0.29	0.30
23478-pecdf	0.25	<DL	<DL	#DIV/0!	0.64	0.88	0.47	0.56	0.68
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	#DIV/0!	0.33	0.45	0.21	<DL	0.25
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.65	0.47	0.78	0.28	0.59	0.32	0.39	0.42
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	0.09	<DL	0.14	0.26	0.35	0.19	0.21	0.25
12378-pecdd	0.25	<DL	<DL	#DIV/0!	0.27	0.40	0.22	0.22	0.23
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.51	<DL	0.76	<DL	<DL	<DL	<DL	<DL
ocdd	0.50	0.87	0.51	1.57	2.54	3.66	1.75	3.02	1.61
DTEo		0.201	0.150	0.40	1.788	2.630	1.298	1.455	1.562
DTEd		1.903	2.167	1.74	1.973	2.815	1.458	1.685	1.747
DTEh		1.05	1.16	1.07	1.88	2.72	1.38	1.57	1.65
DTEh sd				0.12					
DTEh Confidence				0.08					
DTEh 95 UCL				**1.14**					
	% FTAL			**76**					
% Lipids		3.91	4.06	2.77	3.69	5.12	2.40	2.85	2.84
Sample weight (g)		17.8	15.9		50.1	50.1	50.1	50.1	50.0

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ARY-WHS-C6	ARY-WHS-C7	ARY-WHS-C8	ARY-WHS-C9	ARY-WHS-C10	ARY-WHS	ALV-SMB-01	ALV-SMB-02
WRI ID		01-383-C6	01-388-C7	01-373-C8	01-381-C9	01-379-C10	AVE	01-066	01-067
Compound	**DL (ng/Kg)**								
2378-tcdf	0.11	10.3	12.9	9.58	8.75	11.2	9.56	2.88	2.39
12378-pecdf	0.25	0.51	0.47	0.36	0.31	0.39	0.38	<DL	<DL
23478-pecdf	0.25	0.61	0.94	0.59	0.78	0.63	0.68	0.28	0.21
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123678-hxcdf	0.25	0.36	0.27	0.42	0.25	0.31	0.32	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
1234678-hpcdf	0.50	0.47	0.55	0.38	0.41	0.58	0.44	<DL	<DL
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.51	0.48
2378-tcdd	0.10	0.27	0.31	0.24	0.28	0.20	0.26	0.25	0.29
12378-pecdd	0.25	0.35	0.39	0.28	0.31	0.27	0.29	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.49	0.71
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
ocdd	0.50	2.06	1.95	2.57	2.64	3.14	2.49	1.15	0.77
DTEo		2.021	2.516	1.837	1.900	1.962	1.90	0.727	0.705
DTEd		2.181	2.676	1.997	2.060	2.122	2.07	1.155	1.133
DTEh		2.10	2.60	1.92	1.98	2.04	1.98	0.94	0.92
DTEh sd							0.42		
DTEh Confidence							0.26		
DTEh 95 UCL							**2.25**		
	% FTAL						**150**		
% Lipids		4.20	4.99	3.40	3.37	4.20	3.71	0.43	0.45
Sample weight (g)		50.0	50.1	50.0	50.1	50.1		50.1	50.0

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ALV-SMB-03	ALV-SMB-04	ALV-SMB-05	ALV-SMB-06	ALV-SMB-07	ALV-SMB-08	ALV-SMB-09	ALV-SMB-10	ALV-SMB
WRI ID		01-068	01-069	01-070	01-071	01-072	01-073	01-074	01-075	AVE
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	2.51	6.02	5.06	4.59	2.86	5.31	1.78	1.99	3.54
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
23478-pecdf	0.25	0.33	0.65	0.48	0.55	0.41	0.69	<DL	<DL	0.45
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
ocdf	0.50	0.72	1.65	1.02	0.79	0.55	0.59	<DL	<DL	0.79
2378-tcdd	0.10	0.31	0.58	0.46	0.36	0.26	0.31	0.13	0.16	0.31
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123478-hxcdd	0.25	0.63	0.84	0.88	0.56	0.32	0.72	0.29	0.32	0.58
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
ocdd	0.50	0.99	2.03	1.24	0.98	0.75	2.21	0.55	0.67	1.13
DTEo		0.790	1.591	1.294	1.150	0.783	1.258	0.337	0.391	0.90
DTEd		1.217	2.019	1.722	1.578	1.211	1.686	0.890	0.944	1.36
DTEh		1.00	1.81	1.51	1.36	1.00	1.47	0.61	0.67	1.13
DTEh sd										0.39
DTEh Confidence										0.24
DTEh 95 UCL										**1.37**
	% FTAL									**91**
% Lipids		0.46	0.86	0.76	0.61	0.44	0.78	0.19	0.25	2.39
Sample weight (g)		50.0	50.1	50.0	50.1	50.0	50.0	50.0	50.0	

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ALV-SSMB-01	ALV-SSMB-02	ALV-SSMB-03	ALV-SSMB-04	ALV-SSMB-05	ALV-SSMB-06	ALV-SSMB-07	ALV-SSMB-08
WRI ID		01-390	01-391	01-392	01-393	01-394	01-395	01-396	01-397
Compound	**DL (ng/Kg)**	**	**	**	**	**	**	**	**
2378-tcdf	0.11	3.26	2.69	3.41	2.69	2.47	1.87	2.31	2.01
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	0.75	<DL	0.67	<DL	0.55	<DL	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	0.31	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdd	0.50	2.66	3.01	2.87	1.54	1.85	1.26	1.18	1.36
DTEo		0.326	0.269	0.341	0.579	0.247	0.187	0.231	0.201
DTEd		2.359	2.302	2.374	2.312	2.280	2.897	2.941	2.911
DTEh		1.34	1.29	1.36	1.45	1.26	1.54	1.59	1.56
DTEh sd									
DTEh Confidence									
DTEh 95 UCL									
	% FTAL								
% Lipids		3.41	3.25	3.27	5.53	1.98	5.12	4.33	3.61
Sample weight (g)		16.8	14.2	15.7	13.2	13.4	10.5	12.4	9.5

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ALV-SSMB-09	ALV-SSMB-10	ALV-SSMB	ALV-WHS-C1	ALV-WHS-C2	ALV-WHS-C3	ALV-WHS-C4	ALV-WHS-C5
WRI ID		01-398	01-399	AVE	01-289-C1	01-288-C2	01-283-C3	01-278-C4	01-279-C5
Compound	**DL (ng/Kg)**	**	**						
2378-tcdf	0.11	1.58	1.25	2.35	6.05	7.31	5.78	10.5	5.69
12378-pecdf	0.25	<DL	<DL	#DIV/0!	0.35	0.51	0.47	0.66	0.53
23478-pecdf	0.25	<DL	<DL	#DIV/0!	0.28	0.44	0.34	0.58	0.25
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	0.25	<DL	0.36	0.26
123678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	0.38	0.35	0.28	0.57	0.25
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	0.65	0.66	0.42	0.94	0.58
1234678-hpcdf	0.50	<DL	<DL	#DIV/0!	0.35	0.47	0.39	0.68	<DL
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	0.66	0.84	1.88	0.78	2.47	0.94
2378-tcdd	0.10	<DL	<DL	0.08	0.25	0.29	0.27	0.35	0.24
12378-pecdd	0.25	<DL	<DL	#DIV/0!	0.23	0.31	0.24	0.37	0.26
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	0.39	0.43	0.47	0.61	0.28
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	#DIV/0!	0.48	0.51	0.40	0.87	<DL
ocdd	0.50	0.98	<DL	1.86	0.75	1.58	0.97	2.29	0.67
DTEo		0.158	0.125	0.27	1.393	1.756	1.407	2.357	1.358
DTEd		2.868	2.835	2.61	1.498	1.836	1.512	2.437	1.448
DTEh		1.51	1.48	1.44	1.45	1.80	1.46	2.40	1.40
DTEh sd				0.12					
DTEh Confidence				0.07					
DTEh 95 UCL				**1.51**					
	% FTAL			**101**					
% Lipids		4.49	3.65	3.86	3.49	3.74	3.35	5.30	3.27
Sample weight (g)		9.0	6.9		50.1	50.0	50.0	50.1	50.1

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ALV-WHS-C6	ALV-WHS-C7	ALV-WHS-C8	ALV-WHS-C9	ALV-WHS-C10	ALV-WHS-	AGI-SMB-01	AGI-SMB-02	AGI-SMB-03
WRI ID		01-282-C6	01-280-C7	01-275-C8	01-276-C9	01-272-C10	AVE	01-091	01-092	01-093
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	4.36	6.87	5.49	6.47	8.65	6.72	0.99	1.98	1.24
12378-pecdf	0.25	0.35	0.57	0.26	0.61	0.72	0.50	1.02	2.01	1.29
23478-pecdf	0.25	0.46	0.52	0.30	0.48	0.54	0.42	<DL	<DL	<DL
123478-hxcdf	0.25	0.24	0.33	<DL	0.22	0.29	0.28	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	0.29	<DL	0.26	0.31	0.34	<DL	<DL	<DL
123789-hxcdf	0.25	0.41	0.75	0.51	0.46	0.82	0.62	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	0.42	<DL	0.40	0.51	0.46	0.77	1.55	1.06
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdf	0.50	0.55	1.03	1.02	0.75	1.25	1.15	<DL	<DL	<DL
2378-tcdd	0.10	0.21	0.38	0.28	0.34	0.32	0.29	0.15	0.26	0.21
12378-pecdd	0.25	0.19	0.31	0.31	0.29	0.35	0.29	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	0.35	0.24	0.27	0.57	0.40	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	0.49	<DL	0.43	0.77	0.56	0.68	1.24	0.85
ocdd	0.50	0.59	0.78	0.64	1.02	3.21	1.25	1.59	3.36	2.72
DTEo		1.149	1.847	1.377	1.677	2.053	1.64	0.315	0.587	0.418
DTEd		1.289	1.927	1.517	1.757	2.133	1.74	0.870	1.142	0.973
DTEh		1.22	1.89	1.45	1.72	2.09	1.69	0.59	0.86	0.70
DTEh sd							0.36			
DTEh Confidence							0.23			
DTEh 95 UCL							**1.91**			
	% FTAL						**127**			
% Lipids		2.85	3.61	2.28	3.36	4.28	3.55	0.55	0.89	0.71
Sample weight (g)		50.1	50.0	50.0	50.1	50.1		50.0	50.1	50.1

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		AGI-SMB-04	AGI-SMB-05	AGI-SMB	AGI-WHS-C1	AGI-WHS-C2	AGI-WHS	ALW-SMB-C1	ALW-SMB-C2	ALW-SMB
WRI ID		01-094	01-095	AVE	01-357-C1	01-355-C2	AVE	01-425-C1	01-423-C2	AVE
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	0.69	0.87	1.15	1.98	2.31	2.15	0.45	0.61	0.53
12378-pecdf	0.25	0.56	0.77	1.13	0.87	1.02	0.95	<DL	<DL	#DIV/0!
23478-pecdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
123678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	0.33	0.47	0.40
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
1234678-hpcdf	0.50	0.31	0.49	0.84	0.26	0.35	0.31	0.42	0.59	0.51
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
ocdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
2378-tcdd	0.10	0.09	0.10	0.16	0.15	0.19	0.17	<DL	<DL	#DIV/0!
12378-pecdd	0.25	<DL	<DL	#DIV/0!	0.14	0.15	0.15	<DL	<DL	#DIV/0!
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
123789-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!
1234678-hpcdd	0.50	0.51	0.45	0.75	0.55	0.63	0.59	<DL	<DL	#DIV/0!
ocdd	0.50	0.66	1.28	1.92	1.36	1.28	1.32	2.85	2.61	2.73
DTEo		0.195	0.235	0.35	0.540	0.632	0.59	0.082	0.114	0.10
DTEd		0.750	0.790	0.90	0.845	0.937	0.89	0.730	0.762	0.75
DTEh		0.47	0.51	0.63	0.69	0.78	0.74	0.41	0.44	0.42
DTEh sd				0.16			0.07			0.02
DTEh Confidence				0.14			0.09			0.03
DTEh 95 UCL				**0.77**			**0.83**			**0.45**
	% FTAL			**51**			**55**			**30**
% Lipids		0.21	0.32	0.54	1.03	1.11		1.07	1.15	1.11
Sample weight (g)		50	50		50.0	50.1		50.1	50.0	

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ALW-WHP-C1	ALW-WHP-C2	ALW-WHP	ALW-WHS-C1	ALW-WHS-C2	ALW-WHS	ALS-SMB-01	ALS-SMB-02	ALS-SMB-03
WRI ID		01-106-C1	01-107-C2	AVE	01-345-C1	01-346-C2	AVE	01-006	01-007	01-008
Compound	**DL (ng/Kg)**					**				
2378-tcdf	0.11	0.27	0.21	0.24	0.26	0.65	0.46	4.46	4.95	1.41
12378-pecdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	0.38	0.24	0.52
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdf	0.25	0.24	<DL	0.24	<DL	0.25	0.25	0.19	0.25	0.58
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdf	0.50	0.31	0.26	0.29	0.51	0.64	0.58	0.51	0.46	0.86
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
2378-tcdd	0.10	0.15	0.09	0.12	<DL	<DL	#DIV/0!	0.26	0.33	0.43
12378-pecdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	0.45	0.39
1234678-hpcdd	0.50	0.39	<DL	0.39	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdd	0.50	1.85	1.03	1.44	1.41	1.97	1.69	0.39	1.03	0.76
DTEo		0.208	0.114	0.16	0.031	0.097	0.06	0.920	1.020	0.937
DTEd		0.751	0.686	0.72	0.704	0.742	0.72	1.343	1.417	1.334
DTEh		0.48	0.40	0.44	0.37	0.42	0.39	1.13	1.22	1.14
DTEh sd				0.06			0.04			
DTEh Confidence				0.08			0.05			
DTEh 95 UCL				**0.52**			**0.44**			
	% FTAL			**35**			**30**			
% Lipids		1.11	0.54	0.82	0.32	0.84	0.58	0.35	0.32	0.89
Sample weight (g)		50	50		50.1	50.1		50.1	50.0	50.0

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		ALS-SMB-04	ALS-SMB-05	ALS-SMB	KMD-BNT-1	KMD-BNT-2	KMD-BNT-3	KMD-BNT-4	KMD-BNT-5	KMD-BNT
WRI ID		01-009	01-010	AVE	01-076	01-077	01-078	01-079	01-080	ave
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	2.73	4.57	3.62	0.32	0.54	0.39	0.28	0.24	0.35
12378-pecdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
23478-pecdf	0.25	0.41	0.46	0.40	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdf	0.25	0.47	0.35	0.37	0.22	0.37	0.33	0.19	<DL	0.28
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdf	0.50	0.74	0.58	0.63	0.31	0.74	0.41	0.36	0.20	0.40
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
ocdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
2378-tcdd	0.10	0.74	0.30	0.41	<DL	<DL	<DL	<DL	<DL	#DIV/0!
12378-pecdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdd	0.25	0.90	0.26	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdd	0.50	<DL	<DL	#DIV/0!	0.41	0.97	0.76	0.52	0.48	0.63
ocdd	0.50	0.43	0.70	0.66	0.96	2.66	1.75	1.26	1.08	1.54
DTEo		1.362	1.054	1.06	0.061	0.108	0.084	0.056	0.031	0.07
DTEd		1.760	1.451	1.46	0.704	0.751	0.726	0.698	0.698	0.72
DTEh		1.56	1.25	1.26	0.38	0.43	0.41	0.38	0.36	0.39
DTEh sd				0.18						0.03
DTEh Confidence				0.15						0.02
DTEh 95 UCL				**1.41**						**0.41**
	% FTAL			**94**						**28**
% Lipids		0.65	0.70	0.58	2.89	4.27	3.38	2.69	2.17	3.08
Sample weight (g)		50.1	50.1		50.1	50.0	50.0	50.1	50.1	50.06

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KNW-SMB-1	KNW-SMB-2	KNW-SMB-3	KNW-SMB-4	KNW-SMB-5	KNW-SMB-6	KNW-SMB-7	KNW-SMB-8	KNW-SMB-9
WRI ID		01-206	01-207	01-208	01-209	01-210	01-211	01-212	01-213	01-214
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	0.39	0.58	0.71	0.64	1.55	1.13	0.62	1.32	0.84
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	0.25	<DL	<DL	<DL	0.24	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	0.49	0.52	<DL	1.22	1.41	0.64	1.39	0.75
ocdd	0.50	1.45	1.88	2.66	2.26	3.91	3.75	2.09	4.06	3.15
DTEo		0.039	0.063	0.101	0.064	0.168	0.127	0.093	0.146	0.092
DTEd		0.717	0.736	0.749	0.742	0.840	0.800	0.740	0.819	0.764
DTEh		0.38	0.40	0.43	0.40	0.50	0.46	0.42	0.48	0.43
DTEh sd										
DTEh Confidence										
DTEh 95 UCL										
	% FTAL									
% Lipids		0.26	0.53	0.67	0.50	1.05	1.06	0.63	1.11	0.88
Sample weight (g)		50.0	50.0	50.1	50.1	50.0	50.1	50.1	50.0	50.0

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KNW-SMB-10	KNW-SMB	KNW-WHS-1	KNW-WHS-2	KNW-WHS-3	KNW-WHS-4	KNW-WHS-5	KNW-WHS-6	KNW-WHS-7
WRI ID		01-215	ave	01-251	01-252	01-253	01-254	01-255	01-256	01-257
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	0.96	0.87	0.22	0.31	0.63	0.35	0.47	0.33	0.59
12378-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	#DIV/0!	<DL	<DL	0.45	0.25	0.39	<DL	0.52
1234789-hpcdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.91	0.92	<DL	<DL	0.73	<DL	0.51	<DL	0.61
ocdd	0.50	2.97	2.82	<DL	0.51	0.78	0.55	0.71	0.50	0.89
DTEo		0.105	0.10	0.022	0.031	0.075	0.038	0.056	0.033	0.070
DTEd		0.778	0.77	0.700	0.709	0.742	0.710	0.724	0.711	0.738
DTEh		0.44	0.43	0.36	0.37	0.41	0.37	0.39	0.37	0.40
DTEh sd			0.04							
DTEh Confidence			0.02							
DTEh 95 UCL			**0.46**							
	% FTAL		**31**							
% Lipids		0.84	0.75	0.97	1.72	2.47	1.84	2.09	1.65	2.92
Sample weight (g)		50.1	50.05	50.1	50.1	50.1	50.0	50.1	50.0	50.0

** For sample weights below 40 gra

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KNW-WHS-8	KNW-WHS-9	KNW-WHS-10	KNW-WHS	KFF-BNT-1	KFF-BNT-2	KFF-BNT-3	KFF-BNT-4	KFF-BNT-5
WRI ID		01-258	01-259	01-260	ave	01-136	01-137	01-138	01-139	01-140
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	0.56	0.29	0.48	0.42	2.23	2.74	0.81	1.06	0.94
12378-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.43	<DL	0.49	0.42	1.48	1.30	0.56	0.61	0.47
1234789-hpcdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	#DIV/0!	1.82	1.48	0.64	0.75	0.51
12378-pecdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.53	<DL	0.50	0.58	1.49	1.65	0.33	0.61	0.45
ocdd	0.50	1.02	0.48	0.76	0.69	3.26	3.45	1.02	2.15	1.47
					#DIV/0!					
					#DIV/0!					
DTEo		0.066	0.029	0.058	0.05	2.073	1.784	0.730	0.868	0.613
DTEd		0.733	0.707	0.726	0.72	2.641	2.351	1.298	1.436	1.181
DTEh		0.40	0.37	0.39	0.38	2.36	2.07	1.01	1.15	0.90
DTEh sd					0.02					
DTEh Confidence					0.01					
DTEh 95 UCL					**0.39**					
	% FTAL				**26**					
% Lipids		2.54	1.45	2.10		3.37	3.29	1.33	1.06	1.08
Sample weight (g)		50.1	50.0	50.1		50.0	50.0	50.1	50.0	50.0

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KFF-BNT	KFF-SMB-1	KFF-SMB-2	KFF-SMB-3	KFF-SMB-4	KFF-SMB-5	KFF-SMB-6	KFF-SMB-7	KFF-SMB-8
WRI ID		ave	01-231	01-232	01-233	01-234	01-235	01-236	01-237	01-238
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	1.56	0.87	0.91	1.15	1.02	0.85	0.76	0.59	0.83
12378-pecdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.88	0.42	0.38	0.47	0.43	0.31	0.25	<DL	0.39
1234789-hpcdf	0.50	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	1.04	0.29	0.35	0.39	0.45	0.41	0.34	0.25	0.33
12378-pecdd	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.91	0.51	0.71	0.56	0.75	0.62	0.46	<DL	0.59
ocdd	0.50	2.27	1.15	1.21	1.39	1.48	1.26	0.91	0.77	1.06
DTEo		1.21	0.386	0.452	0.515	0.564	0.504	0.423	0.309	0.423
DTEd		1.78	0.954	1.020	1.083	1.131	1.072	0.991	0.887	0.990
DTEh		1.50	0.67	0.74	0.80	0.85	0.79	0.71	0.60	0.71
DTEh sd		0.67								
DTEh Confidence		0.58								
DTEh 95 UCL		**2.08**								
	% FTAL	**139**								
% Lipids		2.03	0.57	0.60	0.58	0.62	0.67	0.47	0.47	0.56
Sample weight (g)		50.02	50.0	50.1	50.0	50.1	50.1	50.0	50.0	50.0

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KFF-SMB-9	KFF-SMB-10	KFFSMB	KFF-WHS-1	KFF-WHS-2	KFF-WHS-3	KFF-WHS-4	KFF-WHS-5	KFF-WHS-6
WRI ID		01-239	01-240	ave	01-241	01-242	01-243	01-244	01-245	01-246
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	0.52	0.69	0.82	2.15	1.76	1.43	1.34	1.87	0.95
12378-pecdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	#DIV/0!	0.84	0.66	0.48	0.54	0.81	0.31
123789-hxcdf	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	0.28	0.37	<DL	<DL	<DL	<DL	<DL	<DL
1234789-hpcdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	0.26	0.35	0.34	0.45	0.38	0.34	0.29	0.36	0.21
12378-pecdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	0.67	0.61	0.88	0.64	0.72	0.53	0.91	0.35
ocdd	0.50	0.78	1.18	1.12	4.04	3.88	3.71	2.95	3.31	1.55
DTEo		0.312	0.429	0.43	0.758	0.629	0.539	0.484	0.637	0.340
DTEd		0.890	0.996	1.00	1.306	1.176	1.086	1.031	1.185	0.887
DTEh		0.60	0.71	0.72	1.03	0.90	0.81	0.76	0.91	0.61
DTEh sd				0.08						
DTEh Confidence				0.05						
DTEh 95 UCL				**0.77**						
	% FTAL			**51**						
% Lipids		0.37	0.57	0.55	2.92	2.79	2.61	1.99	2.48	1.84
Sample weight (g)		50.0	50.0	50.03	50.0	50.1	50.1	50.1	50.1	50.1

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KFF-WHS-7	KFF-WHS-8	KFF-WHS-9	KFF-WHS-10	KFFWHS	KWL-BNT-1	KWL-BNT-2	KWL-BNT-3	KWL-BNT-4
WRI ID		01-247	01-248	01-249	01-250	ave	01-141	01-142	01-143	01-144
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	1.19	1.39	1.05	2.06	1.52	0.41	0.34	0.75	1.15
12378-pecdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	0.49	0.37	0.66	0.75	0.59	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	<DL	<DL	<DL	#DIV/0!	0.44	0.39	0.95	1.14
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
2378-tcdd	0.10	0.26	0.25	0.196	0.42	0.32	0.30	0.22	0.51	0.75
12378-pecdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.47	<DL	0.51	0.72	0.64	0.62	0.57	1.36	1.85
ocdd	0.50	2.66	2.08	1.95	3.69	2.98	1.15	0.86	2.04	3.66
DTEo		0.433	0.426	0.372	0.709	0.53	0.352	0.264	0.608	0.895
DTEd		0.981	0.979	0.914	1.256	1.08	0.919	0.831	1.176	1.463
DTEh		0.71	0.70	0.64	0.98	0.81	0.64	0.55	0.89	1.18
DTEh sd						0.14				
DTEh Confidence						0.09				
DTEh 95 UCL						**0.90**				
	% FTAL					**60**				
% Lipids		1.80	1.74	1.82	3.39		1.00	0.45	1.89	2.87
Sample weight (g)		50.0	50.0	50.0	50.0		50.1	50.0	50.0	50.1

** For sample weights below 40 grai

APPENDIX 2A. DIOXINS AND FURANS IN 2001 FISH SAMPLES: ANDROSCOGGIN RIVER AND KENNEBEC RIVER

DEP ID		KWL-BNT-5	KWL-BNT	KFF-SMB-1	KSD-SMB-1	KSD-SMB-2	KSD-SMB-3	KSD-SMB-4	KSD-SMB-5	KSD-SMB
WRI ID		01-145	ave	01-231	01-081	01-082	01-083	01-084	01-085	ave
Compound	**DL (ng/Kg)**									
2378-tcdf	0.11	0.66	0.66	0.87	0.95	1.12	1.32	1.06	1.44	1.18
12378-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
23478-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123478-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdf	0.25	<DL	#DIV/0!	<DL	0.31	0.52	0.41	0.39	0.57	0.44
234678-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdf	0.50	0.72	0.73	0.42	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234789-hpcdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
ocdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
2378-tcdd	0.10	0.34	0.42	0.29	0.19	0.22	0.25	0.16	0.29	0.22
12378-pecdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123478-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
123789-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdd	0.50	1.02	1.08	0.51	0.44	0.65	0.75	0.39	0.84	0.61
ocdd	0.50	1.88	1.92	1.15	0.86	1.21	1.54	2.61	1.84	1.61
DTEo		0.424	0.51	0.386	0.320	0.391	0.431	0.309	0.500	0.39
DTEd		0.991	1.08	0.954	0.868	0.938	0.978	0.857	1.047	0.94
DTEh		0.71	0.79	0.67	0.59	0.66	0.70	0.58	0.77	0.66
DTEh sd			0.25							0.08
DTEh Confidence			0.22							0.07
DTEh 95 UCL			**1.01**							**0.73**
% FTAL			**67**							**49**
% Lipids		1.25	1.49	0.57	0.41	0.60	0.60	0.51	0.70	0.57
Sample weight (g)		50.0	50.04	50.0	50.0	50.0	50.0	50.0	50.0	50.00

** For sample weights below 40 gra

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBW-SMB-1	PBW-SMB-2	PBW-SMB-3	PBW-SMB-4	PBW-SMB-8	PBW-SMB-11	PBW-SMB-12	PBW-SMB-13	PBW-SMB-14
WRI ID		01-186	01-187	01-188	01-189	01-190	01-191	01-192	01-193	01-194
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.68	0.38	0.71	0.54	0.48	0.82	0.55	0.31	0.72
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	0.31	<DL	0.25	<DL	0.19	0.33	0.42	<DL	0.31
123678-hxcdf	0.25	0.38	<DL	0.29	0.26	0.31	0.38	0.35	<DL	0.29
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.52	0.30	0.55	0.41	0.62	0.65	0.44	0.24	0.71
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdd	0.50	1.16	0.66	1.22	0.84	0.72	1.47	0.83	0.52	1.65
DTEo		0.14	0.04	0.13	0.08	0.10	0.16	0.14	0.03	0.14
DTEd		0.76	0.71	0.75	0.73	0.73	0.78	0.76	0.71	0.76
DTEh		0.45	0.38	0.44	0.41	0.42	0.47	0.45	0.37	0.45
DTEh sd										
DTEh Confidence										
DTEh 95 UCL										
% **FTAL**										
% Lipids		0.67	0.21	0.52	0.44	0.44	0.82	0.49	0.18	0.82
Sample weight (g)		50.1	50.0	50.1	50.0	50.0	50.1	50.1	50.1	50.1
		Values less than the established MDLs are to be considered estimated values.								
		* = Values are influenced by the presence of diphenyl ethers and are estimated maximum concentrations.								

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBW-SMB-15	PBW-SMB	PBW-WHS-3	PBW-WHS-4	PBW-WHS-7	PBW-WHS-14	PBW-WHS-15	PBW-WHS-18	PBW-WHS-19
WRI ID		01-195	ave	01-196	01-197	01-198	01-199	01-200	01-201	01-202
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.61	0.58	0.38	0.46	0.33	0.59	0.28	0.36	0.41
12378-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	0.24	0.292857143	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	0.26	0.315	0.25	0.31	0.28	0.37	0.19	0.25	0.31
234678-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.58	0.502	0.25	0.41	0.28	0.52	0.27	0.39	0.41
1234789-hpcdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	#DIV/0!	0.45	0.56	0.47	0.88	0.41	0.56	0.62
ocdd	0.50	1.03	1.01	1.06	1.26	1.51	1.49	0.99	1.54	1.84
DTEo		0.12	0.11	0.07	0.09	0.07	0.11	0.05	0.07	0.08
DTEd		0.74	0.74	0.71	0.73	0.71	0.75	0.70	0.71	0.73
DTEh		0.43	0.43	0.39	0.41	0.39	0.43	0.38	0.39	0.40
DTEh sd			0.03							
DTEh Confidence			0.02							
DTEh 95 UCL			**0.45**							
% FTAL			**30**							
% Lipids		0.58	0.51647	1.43	1.92	1.62	2.84	1.31	1.66	1.70
Sample weight (g)		50.0	50.06	50.0	50.0	50.1	50.0	50.0	50.1	50.0

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBW-WHS-24	PBW-WHS-27	PBW-WHS-28	PBW-WHS	PBL-SMB-1	PBL-SMB-7	PBL-SMB-8	PBL-SMB-12	PBL-SMB-13
WRI ID		01-203	01-204	01-205	ave	01-126	01-127	01-128	01-129	01-130
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.51	0.72	0.45	0.449	1.15	1.54	0.71	1.44	1.59
12378-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	0.41	0.48	0.26	0.311	0.28	0.35	0.44	0.38	0.47
234678-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.52	0.66	0.48	0.419	0.24	0.36	0.41	0.39	0.51
1234789-hpcdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	#DIV/0!	0.33	0.41	0.45	0.47	0.51
12378-pecdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	1.02	2.21	1.45	0.863	<DL	<DL	<DL	<DL	<DL
ocdd	0.50	2.06	2.75	1.54	1.604	1.62	2.41	1.89	1.55	2.06
DTEo		0.11	0.15	0.09	0.09	0.48	0.60	0.57	0.66	0.72
DTEd		0.75	0.79	0.73	0.73	1.02	1.15	1.12	1.20	1.27
DTEh		0.43	0.47	0.41	0.41	0.75	0.88	0.84	0.93	1.00
DTEh sd					0.03					
DTEh Confidence					0.02					
DTEh 95 UCL					**0.43**					
% FTAL					**28**					
% Lipids		2.40	3.41	1.77	2.00705	0.76	1.02	1.05	0.96	1.03
Sample weight (g)		50.1	50.1	50.0	50.04	50.1	50.1	50.0	50.1	50.0

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBL-SMB-14	PBL-SMB-15	PBL-SMB-16	PBL-SMB-18	PBL-SMB-19	PBL-SMB	PBL-WHS-3	PBL-WHS-10	PBL-WHS-12
WRI ID		01-131	01-132	01-133	01-134	01-135	ave	01-156	01-157	01-158
Compound	**(ng/Kg)**									
2378-tcdf	0.11	1.35	0.77	1.15	0.89	1.08	1.167	1.85	1.40	1.74
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdf	0.25	0.45	0.20	0.48	0.33	0.49	0.387	0.15	<DL	0.18
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdf	0.50	0.44	0.24	0.41	0.29	0.44	0.373	0.48	0.35	0.41
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
2378-tcdd	0.10	0.36	0.15	0.31	0.42	0.45	0.386	0.41	0.24	0.38
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.38	0.22	0.34
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.88	0.61	0.89
ocdd	0.50	1.14	0.85	1.54	1.06	1.47	1.559	1.58	0.99	1.74
DTEo		0.54	0.25	0.48	0.55	0.61	0.545	0.66	0.41	0.62
DTEd		1.09	0.80	1.02	1.09	1.16	1.09	1.18	0.95	1.14
DTEh		0.82	0.52	0.75	0.82	0.89	0.82	0.92	0.68	0.88
DTEh sd							0.13			
DTEh Confidence							0.08			
DTEh 95 UCL							**0.90**			
% FTAL							**60**			
% Lipids		0.87	0.38	0.73	0.58	0.91	0.82802	3.64	1.94	3.37
Sample weight (g)		50.0	50.1	50.0	50.0	50.1	50.05	50.0	50.0	50.1

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBL-WHS-13	PBL-WHS-14	PBL-WHS-15	PBL-WHS-20	PBL-WHS-21	PBL-WHS-22	PBL-WHS-23	PBL-WHS	PBC-SMB-2
WRI ID		01-159	01-160	01-161	01-162	01-163	01-164	01-165	ave	01-116
Compound	**(ng/Kg)**									
2378-tcdf	0.11	1.16	1.26	2.11	1.35	1.02	1.31	2.51	1.571	1.85
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123678-hxcdf	0.25	<DL	<DL	0.25	<DL	<DL	<DL	0.20	0.195	0.51
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
1234678-hpcdf	0.50	<DL	0.29	0.55	<DL	<DL	0.25	0.62	0.421428571	0.55
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
2378-tcdd	0.10	0.25	0.35	0.49	0.27	0.19	0.31	0.52	0.341	0.20
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123678-hxcdd	0.25	0.27	0.31	0.45	0.26	0.15	0.23	0.51	0.312	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
1234678-hpcdd	0.50	0.52	0.74	1.06	0.47	<DL	0.51	1.22	0.766666667	<DL
ocdd	0.50	1.06	2.05	2.10	1.88	0.87	1.55	3.01	1.683	1.06
DTEo		0.40	0.52	0.79	0.44	0.31	0.47	0.86	0.547	0.44
DTEd		0.95	1.06	1.30	0.98	0.86	1.01	1.38	1.08	0.99
DTEh		0.67	0.79	1.05	0.71	0.58	0.74	1.12	0.81	0.72
DTEh sd									0.17	
DTEh Confidence									0.11	
DTEh 95 UCL									**0.92**	
% **FTAL**									**61**	
% Lipids		1.99	2.90	4.39	2.08	1.52	2.36	4.43	2.86193	0.49
Sample weight (g)		50.1	50.0	50.0	50.1	50.0	50.0	50.1	50.04	50.0

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBC-SMB-6	PBC-SMB-7	PBC-SMB-11	PBC-SMB-19	PBC-SMB	PBC-WHS-2	PBC-WHS-5	PBC-WHS-6	PBC-WHS-7
WRI ID		01-117	01-118	01-119	01-120	ave	01-146	01-147	01-148	01-149
Compound	**(ng/Kg)**									
2378-tcdf	0.11	1.26	1.55	1.71	1.62	1.60	0.75	1.02	0.89	0.59
12378-pecdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	0.57	0.35	0.41	0.84	0.54	<DL	<DL	<DL	<DL
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.62	0.75	0.71	0.95	0.72	1.25	0.88	0.47	0.41
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
2378-tcdd	0.10	0.26	0.27	0.30	0.41	0.29	0.36	0.41	0.45	0.20
12378-pecdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	0.31	0.42	0.25	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	#DIV/0!	0.85	1.25	1.02	<DL
ocdd	0.50	1.21	1.33	1.52	2.31	1.49	1.65	2.51	2.03	1.12
DTEo		0.45	0.47	0.52	0.67	0.51	0.49	0.58	0.58	0.26
DTEd		1.00	1.02	1.07	1.21	1.06	1.03	1.12	1.12	0.84
DTEh		0.72	0.74	0.79	0.94	0.78	0.76	0.85	0.85	0.55
DTEh sd						0.09				
DTEh Confidence						0.08				
DTEh 95 UCL						**0.86**				
% FTAL						**58**				
% Lipids		0.54	0.63	0.65	1.25	0.71	1.60	2.46	2.91	0.47
Sample weight (g)		50.1	50.1	50.1	50.0	50.06	50.0	50.1	50.0	50.1

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBC-WHS-13	PBC-WHS	PBV-SMB-9	PBV-SMB-12	PBV-SMB-17	PBV-SMB-18	PBV-SMB-19	PBV-SMB	PBV-WHS-C1
WRI ID		01-150	ave	01-121	01-122	01-123	01-124	01-125	ave	01-291
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.81	0.81	0.51	0.89	0.59	0.42	0.50	0.58	3.05
12378-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
23478-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123478-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.25
123678-hxcdf	0.25	<DL	#DIV/0!	0.37	0.68	0.41	0.32	0.39	0.43	0.28
234678-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123789-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
1234678-hpcdf	0.50	1.06	0.81	0.51	0.58	0.33	<DL	0.25	0.42	<DL
1234789-hpcdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
ocdf	0.50	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
2378-tcdd	0.10	0.41	0.37	0.21	0.29	0.19	0.11	0.15	0.19	1.31
12378-pecdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123478-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
123678-hxcdd	0.25	0.36	0.34	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.42
123789-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL
1234678-hpcdd	0.50	0.99	1.03	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.59
ocdd	0.50	2.25	1.91	0.89	1.02	1.24	0.33	0.87	0.87	1.85
DTEo		0.55	0.49	0.30	0.45	0.29	0.18	0.24	0.30	1.72
DTEd		1.09	1.04	0.85	1.00	0.84	0.74	0.79	0.84	2.21
DTEh		0.82	0.76	0.58	0.73	0.57	0.46	0.52	0.57	1.96
DTEh sd			0.13						0.10	
DTEh Confidence			0.11						0.09	
DTEh 95 UCL			**0.88**						**0.66**	
% FTAL			**58**						**44**	
% Lipids		1.72	1.83	0.46	0.93	0.52	0.25	0.34	0.50	7.19
Sample weight (g)		50.0	50.04	50.1	50.1	50.0	50.0	50.1	50.06	50.1

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBV-WHS-C2	PBV-WHS	PBO-EEL-C1	PBO-EEL-C2	PBO-EEL	PBM-SMB-1	PBM-SMB-2	PBM-SMB-3	PBM-SMB-4
WRI ID		01-293	ave	01-301	01-302	ave	01-166	01-167	01-168	01-169
Compound	**(ng/Kg)**									
2378-tcdf	0.11	2.65	2.85	2.16	2.98	2.57	0.48	0.42	0.55	0.48
12378-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	0.44	0.35	<DL	0.35	0.35	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	0.31	0.30	0.71	0.61	0.66	0.46	0.41	0.61	0.57
234678-hxcdf	0.25	<DL	#DIV/0!	0.42	<DL	0.42	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	#DIV/0!	0.51	0.67	0.59	0.35	0.38	0.49	0.41
1234789-hpcdf	0.50	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	#DIV/0!	0.55	<DL	0.55	<DL	<DL	<DL	<DL
2378-tcdd	0.10	1.26	1.29	1.26	0.97	1.12	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	0.33	0.38	0.55	0.47	0.51	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.41	0.50	1.02	0.89	0.96	<DL	<DL	<DL	<DL
ocdd	0.50	2.29	2.07	3.67	4.58	4.13	0.44	0.51	0.85	0.66
DTEo		1.64	1.68	1.66	1.43	1.54	0.10	0.09	0.12	0.11
DTEd		2.13	2.17	2.15	1.92	2.04	0.75	0.73	0.77	0.76
DTEh		1.89	1.93	1.91	1.67	1.79	0.42	0.41	0.44	0.43
DTEh sd			0.06			0.16				
DTEh Confidence			0.08			0.23				
DTEh 95 UCL			**2.00**			**2.02**				
% FTAL			**38**			**135**				
% Lipids		6.52	6.86	13.56	11.82	12.69	0.42	0.34	0.81	0.60
Sample weight (g)		50.1	50.10	50.0	50.1	50.05	50.1	50.0	50.0	50.1

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PBM-SMB-5	PBM-SMB-6	PBM-SMB-7	PBM-SMB-8	PBM-SMB-9	PBM-SMB-10	PBM-SMB	PBM-WHS-1	PBM-WHS-5
WRI ID		01-170	01-171	01-172	01-173	01-174	01-175	ave	01-176	01-179
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.61	0.50	0.34	0.36	0.47	0.31	0.452	0.37	0.71
12378-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123678-hxcdf	0.25	0.48	0.51	0.29	0.28	0.38	0.35	0.434	<DL	0.34
234678-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
1234678-hpcdf	0.50	0.39	0.48	0.37	0.25	0.41	0.28	0.381	<DL	<DL
1234789-hpcdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
12378-pecdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
1234678-hpcdd	0.50	<DL	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.49	0.71
ocdd	0.50	0.48	0.53	0.41	0.39	0.35	0.47	0.509	0.84	1.14
DTEo		0.11	0.11	0.07	0.07	0.09	0.07	0.09	0.04	0.11
DTEd		0.76	0.75	0.71	0.71	0.74	0.72	0.74	0.71	0.76
DTEh		0.44	0.43	0.39	0.39	0.41	0.39	0.42	0.38	0.44
DTEh sd								0.02		
DTEh Confidence								0.01		
DTEh 95 UCL								**0.43**		
% FTAL								**29**		
% Lipids		0.55	0.65	0.37	0.24	0.35	0.32	0.46421	1.16	2.36
Sample weight (g)		50.1	50.1	50.1	50.1	50.1	50.1	50.08	50.1	50.1

DEP ID		PBM-WHS-10	PBM-WHS-11	PBM-WHS-14	PBM-WHS	PWD-SMB-1	PWD-SMB-2	PWD-SMB-3	PWD-SMB-4	PWD-SMB-5
WRI ID		01-180	01-181	01-183	ave	01-051	01-052	01-053	01-054	01-055
Compound	**(ng/Kg)**									tcdf p =
2378-tcdf	0.11	0.36	0.62	0.52	0.52	0.63	0.52	0.89	0.74	0.59
12378-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	<DL	<DL	0.22	0.28	<DL	0.22	0.41	0.35	0.29
234678-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	0.39	0.52	0.44	<DL
1234789-hpcdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
12378-pecdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.62	0.55	0.61	0.60	0.52	0.75	0.95	1.03	0.64
ocdd	0.50	0.66	1.02	0.89	0.91	0.41	1.58	2.37	2.04	1.75
DTEo		0.04	0.07	0.08	0.07	0.068	0.086	0.145	0.124	0.095
DTEd		0.71	0.74	0.73	0.73	0.741	0.728	0.787	0.766	0.740
DTEh		0.38	0.40	0.40	0.40	0.40	0.41	0.47	0.45	0.42
DTEh sd					0.02					
DTEh Confidence					0.02					
DTEh 95 UCL					**0.42**					
% FTAL					**28**					
% Lipids		1.37	1.83	2.73	1.89	0.30	0.31	0.59	0.43	0.17
Sample weight (g)		50.0	50.0	50.0	50.04	50.1	50.1	50.0	50.0	50.1

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PWD-SMB	PWD-WHS-C1	PWD-WHS-C2	PWD-WHS	PWB-SMB-01	PWB-SMB-02	PWB-SMB-03	PWB-SMB-04	PWB-SMB-05
WRI ID		ave	01-056-C1	01-057-C2	ave	01-026	01-027	01-028	01-029	01-030
Compound	**(ng/Kg)**	0.26								
2378-tcdf	0.11	0.67	2.14	4.44	3.29	0.89	0.61	0.87	0.41	1.02
12378-pecdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	#DIV/0!	0.55	0.47	0.51	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	0.32	1.14	0.98	1.06	0.26	<DL	0.19	<DL	0.25
234678-hxcdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	0.45	0.45	0.56	0.51	<DL	<DL	<DL	<DL	<DL
1234789-hpcdf	0.50	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
2378-tcdd	0.10	#DIV/0!	0.21	0.23	0.22	<DL	<DL	<DL	<DL	<DL
12378-pecdd	0.25	#DIV/0!	0.24	0.29	0.27	<DL	<DL	<DL	<DL	<DL
123478-hxcdd	0.25	#DIV/0!	<DL	0.35	0.35	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	#DIV/0!	1.03	1.36	1.19	<DL	<DL	<DL	<DL	<DL
123789-hxcdd	0.25	#DIV/0!	<DL	0.46	0.46	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.78	1.51	0.97	1.24	0.72	0.45	0.63	<DL	0.61
ocdd	0.50	1.63	2.03	3.13	2.58	1.31	0.66	1.02	0.55	1.25
DTEo		0.10	1.176	1.530	1.353	0.122	0.066	0.112	0.041	0.133
DTEd		0.75	1.318	1.622	1.47	0.770	0.738	0.760	0.719	0.781
DTEh		0.43	1.25	1.58	1.41	0.45	0.40	0.44	0.38	0.46
DTEh sd		0.03			0.23					
DTEh Confidence		0.02			0.32					
DTEh 95 UCL		**0.45**			**1.73**					
% FTAL		**30**			**33**					
% Lipids		0.36	10.73	11.78	11.25	0.40	0.25	0.51	0.09	0.64
Sample weight (g)		50.06	50.1	50.1	50.10	50.0	50.1	50.0	50.0	50.1

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		PWB-SMB	PWB-WHS-C1	PWB-WHS-C2	PWB-WHS	SWP-SMB-01	SWP-SMB-02	SWP-SMB-03	SWP-SMB-04	SWP-SMB-05
WRI ID		ave	01-031-C1	01-033-C2	ave	01-086	01-087	01-088	01-089	01-090
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.76	8.52	4.78	6.65	0.36	0.29	0.44	0.48	0.35
12378-pecdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
23478-pecdf	0.25	#DIV/0!	0.91	0.61	0.76	<DL	<DL	<DL	<DL	<DL
123478-hxcdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdf	0.25	0.23	0.36	0.39	0.38	0.20	<DL	0.35	0.46	0.23
234678-hxcdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123789-hxcdf	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
1234678-hpcdf	0.50	#DIV/0!	<DL	0.29	0.29	<DL	0.41	0.68	1.02	0.51
1234789-hpcdf	0.50	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
ocdf	0.50	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	0.78	0.61	0.66
2378-tcdd	0.10	#DIV/0!	0.22	0.11	0.17	0.15	0.16	0.23	0.24	0.16
12378-pecdd	0.25	#DIV/0!	<DL	<DL	#DIV/0!	0.21	0.19	0.25	0.29	0.18
123478-hxcdd	0.25	#DIV/0!	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	<DL
123678-hxcdd	0.25	#DIV/0!	0.38	<DL	0.38	<DL	0.31	0.48	0.51	0.25
123789-hxcdd	0.25	#DIV/0!	0.69	<DL	0.69	<DL	<DL	<DL	<DL	<DL
1234678-hpcdd	0.50	0.60	0.59	1.15	0.87	0.51	1.06	0.67	0.82	0.64
ocdd	0.50	0.96	3.67	2.06	2.87	0.95	0.87	1.02	1.76	1.18
DTEo		0.09	1.676	0.947	1.31	0.421	0.425	0.621	0.694	0.435
DTEd		0.75	2.046	1.364	1.71	0.716	0.717	0.888	0.961	0.702
DTEh		0.42	1.86	1.16	1.51	0.57	0.57	0.75	0.83	0.57
DTEh sd		0.03			0.50					
DTEh Confidence		0.03			0.69					
DTEh 95 UCL		**0.45**			**2.20**					
% **FTAL**		**30**			**42**					
% Lipids		0.38	9.28	6.96	8.12	0.58	0.66	0.85	0.96	0.58
Sample weight (g)		50.04	50.1	50.1	50.10	50.0	47.5	50.0	50.0	50.0

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		SWP-SMB	SEN-SMB-01	SEN-SMB-02	SEN-SMB-03	SEN-SMB-04	SEN-SMB-05	SEN-SMB	SED-SMB-01	SED-SMB-02
WRI ID		ave	01-096	01-097	01-098	01-099	01-100	ave	01-101	01-102
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.38	0.41	0.39	0.31	0.53	0.72	0.47	0.57	0.39
12378-pecdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
23478-pecdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	0.27	0.27	<DL	<DL
123478-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.53	<DL
123678-hxcdf	0.25	0.31	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.57	0.32
234678-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	0.25	<DL
123789-hxcdf	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
1234678-hpcdf	0.50	0.66	0.25	0.51	0.37	0.55	0.46	0.43	0.42	<DL
1234789-hpcdf	0.50	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
ocdf	0.50	0.68	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
2378-tcdd	0.10	0.19	0.11	0.16	0.15	0.13	0.19	0.148	0.09	<DL
12378-pecdd	0.25	0.22	0.21	0.46	0.26	0.37	0.42	0.34	<DL	<DL
123478-hxcdd	0.25	#DIV/0!	<DL	0.20	<DL	0.25	0.33	0.26	<DL	<DL
123678-hxcdd	0.25	0.39	<DL	0.39	0.29	0.33	0.51	0.38	<DL	<DL
123789-hxcdd	0.25	#DIV/0!	<DL	<DL	<DL	<DL	<DL	#DIV/0!	<DL	<DL
1234678-hpcdd	0.50	0.74	<DL	0.73	0.51	0.58	0.88	0.68	0.78	0.51
ocdd	0.50	1.16	0.72	0.89	1.12	0.55	1.03	0.86	2.31	1.26
DTEo		0.52	0.364	0.730	0.479	0.622	0.915	0.62	0.294	0.076
DTEd		0.80	0.686	0.998	0.771	0.890	1.057	0.88	0.787	0.724
DTEh		0.66	0.52	0.86	0.63	0.76	0.99	0.75	0.54	0.40
DTEh sd		0.12						0.18		
DTEh Confidence		0.11						0.16		
DTEh 95 UCL		**0.77**						**0.91**		
% FTAL		**51**						**61**		
% Lipids		0.73	0.34	0.78	0.61	0.75	1.03	0.70	1.78	0.88
Sample weight (g)		49.50	50.0	50.0	50.1	50.1	50.1	50.06	50.1	50.0

APPENDIX 2B. DIOXINS AND FURANS IN 2001 FISH SAMPLES: PENOBSCOT R, PRESUMPSCOT R, SALMON FALLS R, AND SEBASTICOOK R

DEP ID		SED-SMB-03	SED-SMB-04	SED-SMB-05	SED-SMB	SFS-SMB-01	SFS-SMB-02	SFS-SMB-03	SFS-SMB-04	SFS-SMB
WRI ID		01-103	01-104	01-105	ave	01-341	01-342	01-343	01-344	ave
Compound	**(ng/Kg)**									
2378-tcdf	0.11	0.79	0.83	0.48	0.61	1.02	1.31	0.87	0.62	0.96
12378-pecdf	0.25	<DL	0.35	0.23	0.29	<DL	<DL	<DL	<DL	#DIV/0!
23478-pecdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	#DIV/0!
123478-hxcdf	0.25	<DL	0.59	0.71	0.61	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdf	0.25	0.25	0.48	0.44	0.41	<DL	<DL	<DL	<DL	#DIV/0!
234678-hxcdf	0.25	<DL	0.32	0.23	0.27	0.72	0.89	0.20	0.45	0.57
123789-hxcdf	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdf	0.50	<DL	0.54	0.61	0.52	0.56	0.48	0.31	0.58	0.48
1234789-hpcdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	#DIV/0!
ocdf	0.50	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	#DIV/0!
2378-tcdd	0.10	<DL	0.15	0.11	0.12	0.21	0.25	0.13	<DL	0.20
12378-pecdd	0.25	<DL	<DL	<DL	#DIV/0!	0.12	0.19	0.10	<DL	0.14
123478-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	#DIV/0!
123678-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	0.45	<DL	<DL	<DL	0.45
123789-hxcdd	0.25	<DL	<DL	<DL	#DIV/0!	<DL	<DL	<DL	<DL	#DIV/0!
1234678-hpcdd	0.50	0.55	<DL	<DL	0.61	<DL	<DL	<DL	<DL	#DIV/0!
ocdd	0.50	0.85	1.61	0.55	1.32	1.91	1.57	0.75	1.64	1.47
DTEo		0.110	0.395	0.314	0.24	0.555	0.665	0.340	0.113	0.42
DTEd		0.757	0.880	0.799	0.79	0.827	0.963	0.638	0.761	0.80
DTEh		0.43	0.64	0.56	0.51	0.69	0.81	0.49	0.44	0.61
DTEh sd					0.10					0.18
DTEh Confidence					0.08					0.17
DTEh 95 UCL					**0.60**					**0.78**
% **FTAL**					**40**					**52**
% Lipids		0.87	1.96	1.76	1.45	0.68	0.36	0.43	0.27	0.44
Sample weight (g)		50.0	50.0	50.1	50.04	50.0	50.0	50.1	50.1	50.05

APPENDIX 3

TCDD AND TCDF IN SLUDGE FROM

MAINE WASTEWATER TREATMENT PLANTS

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
AMERICAN TISSUE AUGUSTA	880930	62.6	36.9	414.0
	881223	61.4	37.6	326.0
	890403	61.6	34.6	242.0
	890628	65.5	17.7	414.0
	971125		0.5	4.3
AMERICAN PULP AND P BERLIN NH	88		104.0	2930.0
AUBURN VPS	951005		1.3	17.9
AUBURN FIBER	970806		<0.9	9.9
AUGUSTA SANITARY DISTRICT	900409		<1.2	1.3
	900608		<3.9	2.5
	900608		E2.1	10.2
	900914		<20.0	E20.0
	900809		<20	
	910108		<5	5.0
	910220		<1.9	0.8
	910301		<1.9	4.8
	920416		1.9	1.9
	920427		<1.0	1.9
	930223		<1.3	<1.3
	940215		<1.0	<1.0
			<0.02	0.0
			<0.23	1.8
	950227		1.9	<1
	960228		<1	<1
	970408		0.9	<0.9
	980514		<1	<1
ANSON-MADISON SANIT DISTRICT	910408		<1.3	2.2
	911001		1.7	4.6
BANGOR	950104		<19.9	<26.4
BERWICK SEWER DISTR	861111		<2.5	<4.0
	890301	76.4	14.0	19.9
	890927	75.3	<12.1	<12.1
	891208	87.5	1152.0	872.0
BIDDEFORD	900208		7.2	30.0
	900208		39.0	310.0
	910501		<0.86	3.7
	910703		<0.57	<0.95
	920204		<1.5	2.9
	930121		<2.4	<3.2
	940209		<0.19	<0.48
	940913		<1.0	<2.9
	950815		<.22	1.6
	970218		<0.8	<1.7
BREWER	920520		<2.1	36.0
	920901		<6.0	110.0
	921116		3.8	19.0
	930202		<3.7	11.0
	930511		1.2	9.8
	930810		4.1	24.0
	931118		3.8	26.0
	940201		3.2	24.0
	940517		<0.9	14.0
	940823		4.5	26.0
	941108		5.2	36.0
	950613		<1	18.0

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMEN

LOCATION	DATE	%MOIST	TCDD	TCDF
BREWER	960611		2.1	17.0
	970212		3.4	22.0
	980622		<1	<1
	990730		<1	1.3
	000718		1.1	1.0
	010725		<1	<1
	010807		<1	1.8
BOOTHBAY HARBOR SD	011228		<1	2.6
BOWATER				
MILLINOCKET	850618		<0.4	
	880602		<1.9	7.3
	940414		<7.4	<8.9
	940506		<.9	6.7
	950316		<.6	4.0
	960711		<1, <1	<1
	960914		<0.4, <0.3	4.4
	960917		<1	<1
CORINNA SEWER DISTR	850506			
	871117		<11.9	<28.8
	880301		<3.0	8.5
	890222		<13.0	
	890510		<5.0	
	900131		2.3	127.0
	900606		<4.0	85.4
	900606		<4.9	82.2
	900919		<10.0	50.0
	901009		<1.5	<.8
	901024		<8.0	
	910313		<5.0	
	910514			
	920304		<3.9	<8.4
	930405		<4.8	19.9
	930811		<9.9	68.6
	940308		<13.1	46.0
	940810		<5.6	7.8
	950321		<2.1	13.3
	960206		<1.8	12.7
FRASER PAPER LTD	880903	68.3	13.9	233.0
MADAWASKA	890106	79.1	E23.4	204.0
	890406	71.3	E3.83	12.9
	890930	80.1	5.0	E26.6
	940426		<.1	0.8
GARDINER WATER DIST	900918		<0.87	4.6
	910401		1.4	4.4
	911002		<0.54	5.1
	920504		<3.5	9.4
	921116		<.93	<6.4
	930407		<0.13	0.9
	931115		<1.6	<18
	931115			
	931115		<0.9	
	940329		<0.2	<1.1
	941018		<1.2	<4.3
	950221		<2.8	5.2
	951003		<1.7	
	960326		4.1	27.0
	961015		0.8	11.0
	970331		<1.1	<5.8

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
FORT JAMES	880801		12.0	34.0
OLD TOWN	881225	78.6	301.0	963.0
	890423	78.7	380.0	1197.0
	890718	68.8	50.6	478.0
	950103		8.8	65.0
GEORGIA PACIFIC CO	890113	75.8	<6.2	<3.55
WOODLAND	890424	74.7	<0.63	<4.74
	890718	66.0	<1.76	12.9
	891217		0.9	3.2
	910630		<1	2.0
	910630		<1	1.0
	910630		<1	<1
	910630		1.0	4.0
	910630		<1	<1
	910630		<1	2.0
	911231		<1	2.0
	911231		2.0	5.0
	911231		<1	3.0
	911231		<1	2.0
	930108		<1	<1
	940530		<5.0	<5.0
	941222		<5.0	11.9
	950331		<5.0	14.3
	950630		<5.0	<5.0
	950930		<5.0	24.5
	951231		<1.0	3.4
HARTLAND WASTEWATER	881007	65.0	<2.86	<1.71
TREATMENT PLANT	881221	65.5	<7.25	E6.09
	890312	64.3	<0.28	5.6
	890627	63.3	<1.36	6.5
	000127		<0.4	E1.4
	000426		<0.5	<0.4
	000922		<2.1 <3.1	<1.9 <2.2
	001205		<0.8	<0.9
HAWK RIDGE COMPOST	1989-90	mean n=(	6.6	15.9
UNITY	1991	(1.6-13)		mean n=4
(compost)	900420		2.9	15.0
	900507		3.4	6.0
	900628		3.4	31.0
	900712		5.0	40.0
	900817		3.4	31.0
	900820		3.0	30.0
	900820		5.0	40.0
	901010		<5	30.0
	910115		0.6	6.4
	910207		4.0	59.5
	910806		1.6	15.0
	920123		2.6	18.0
	920318		<1	
	920715		<2.0	34.0
	920818		<1.0	18.0
	921007		2.2	23.0
	930111		<2.2	12.0
	930406		1.7	16.0
	930629		1.7	22.0
	931213		3.4	28.0
	940101		2.6	27.0
	940422		<1.0	12.0
	940422		<1	9.1
	940725		1.6	13.0
	941024		<2.4	13.0
			4.9	33.0
	950724		<1	12.0

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
HAWK RIDGE COMPOST	951012		1.1	12.0
UNITY	960131		<1	8.8
(compost)	960501		<1	6.6
	960709		<1	7.6
	961007		1.4	10.0
	970110		<1	1.5
	970305		<1	3.6
	970725		<1	3.8
	971014		<1	3.8
INTERNATIONAL PAPER	850621		51.3W	
JAY	870115		190.0	760.0
	880218		24.0	130.0
	880219		23.0	121.0
	880223		14.0	75.0
	880225		57.0	250.0
	880226		15.0	79.0
	880227		13.0	79.0
	881231		16.6W	143W
	890124		15W	77W
	890126		28.0	112.0
	890323		7.7W	42.6W
	890417		24.0	150.0
	950712		7.2	39.0
	960125		2.6	16.0
	960126		2.8	16.0
	960227		<1.0	14.0
	960228		2.3	14.0
	961015		<1	4.0
	961016		<1	5.4
	961126		4.6	22.0
	961127		2.7	12.0
KENNEBEC SANITARY	870713			
TREATMENT DISTRICT	871105			
WATERVILLE	880118			
	880322			
	880518			
	880921			
	890711			
	891011			
	900410		E7.9	121.0
	900824		3.3	54.0
	901101		3.6	12.0
	901221		3.5	6.7
	901221		3.5	19.0
	910408		<2.3	<3.3
	910606		<2.9	<5.0
	910808		2.3	53.0
	910911		3.1	4.1
	920226		2.6	20.0
	920708		<1.0	11.0
	930914		1.1	6.3
	941021		<1.0	8.2
	951113		<1	1.3
	960924		<1	<1
	971010		<1	12.0
	990120		<1	<1
	990915		<1	<1
	000927		0.4, <4.8, <0.75,	<3.1, 2.9,3
	010108		<.10	<.10
KENNEBUNK SD	011105		EMPC	1.8

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
KIMBERLY-CLARK WINSLOW	871008		36.0	
	871201		13.5	
	880331		25.0	219.0
	880630		19.0	177.0
	880930		22.0	189.0
	881231		17.0	181.0
	890331		18.0	177.0
	890628		14.0	89.0
	890927		11.0	67.0
	891231		13.0	115.0
	900201		12.0	86.0
	900628		12.0	94.0
	900928		9.4	76.0
	901231		7.2	63.0
	910214		12.0	86.0
	910411		8.3	100.0
	910630		4.6	62.0
	910930		6.5	69.0
	911101		6.5	63.2
	911203		6.3	68.1
	920225		6.5	72.1
	920623		5.2	55.0
	921006		5.1	60.0
	921228		7.2	59.0
	930317		4.7	47.0
	930629		4.2	37.0
	930917		3.9	42.0
	931231		5.2	44.0
	940101		3.5	31.0
	940401		3.7	27.0
	940909		4.9	33.0
	941231			30.0
	950331		4.4	42.0
	950608		<1	24.0
	950930		2.2	25.0
	951231		3.0	34.0
	960122	RWT	3.0	34.0
	960410		3.1	29.0
	960702		4.4	36.0
	960702D		1.6	17.0
	961030		2.4	18.0
	961030D		<1	17.0
	970318	RWT	2.4	16.0
	970616	RWT	1.4	16.0
	971104	RWT	1.3	23.0
KITTERY WWTP	990319		<0.4	5.2
LEWISTON-AUBURN TREATMENT PLANT	871231		<1.0	an for year (n=
	881031		0.0	
	900809		E10	9.0
	910306		<7.3	<7.3
	920610		<0.8	4.5
	930625		<1	4.4
	930922		<2.7	<2.5
	950405		<2.2	0.8
	960625		<1	<1
	961202		<1	21.0
	990730		1.0	6.9
	000201	limed	<0.6	8.5

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
LINCOLN PULP & PAPE	881119		48W	223W
LINCOLN	890123	80.9	44.0	203.0
	890123		44.0	173.0
	890407	85.1	49.0	298.0
	890407		41.0	219.0
	890831	83.5	182.0	640.0
	890831		156.0	625.0
	890831		41.0	220.0
	890831		59.0	294.0
	921231		20.4	91.6
	931014		9.1	187.5
	940331	PRI SL	14.9	154.0
	940331	SEC SL	97.1	734.0
	960302		<0.4	<0.3
	960419		4.2	21.7
	960431		4.2	25.1
	970831		3.7	20.0
	971130		<1.5	3.7
	980930		<0.7	1.2
	990531		0.3	1.5
	990930		0.4	1.0
	000130		1.3	1.5
MEADWESTVACO	850621		32.0	
RUMFORD	880602		105.0	674.0
	890108	77.1	114.0	569.0
	890407	73.1	46.5	184.0
	890628	76.8	E9.91	134.0
NORRIDGEWOCK WWTP	011116		0.1	0.8
NORTH JAY WWTP	011127		0.8	<1.6
OAKLAND TREATMENT P	910304		<2.5	10.0
	910329		<5	10.0
	920415		<1.0	<1.0
	920415		<1	<1
	930408		<1.0	<1.0
	930501		<1.0	11.0
	940426		<1.0	<1.0
OGUNQUIT SD	010912		<1.4	1.4
OLD TOWN	880525		<3.0	<3.0
	900212		<2.2	16.7
	910918		<2.9	6.6
	910918		<2.2	
ORONO TREATMENT PLA	900316		2.1	
	900412		8.5	
	901001		3.5	9.2
	901021		3.9	
	910324		<2.1	9.5
	910918		<2.9	6.6
	920323		<0.6	7.6
	920328		9.4	
	920915		<0.5	5.4
	921015		1.1	
	930427		1.3	
	930427		<0.5	3.4
	940502		<0.6	2.5
PERC	910417		<2.0	9.9

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
PORTLAND WATER DIST	861205			
PORTLAND	870402			
	871124			
	880913			
	891206		E1.2	11.3
	891206		1.6	14.5
	901002		<3	10.0
	901002		<3	20.0
	910826		<64	<32
	910828		<66	<140
	920715		<1.1	6.4
	920715		0.9	7.6
	930719		<1	2.3
	930719		<1.1	<3.2
	940718		<1.0	0.8
	950727		0.5	1.0
	960807		<0.7	<0.1
	980811		<0.4	3.4
	980514		<1	<1
	990602		<1	5.6
	000913		<0.1	8.0
	010806		<1	3.2
PORTLAND WATER DIST	861205			
WESTBROOK WWTF	870402			
	871119			
	891205		E1.6	14.5
	901001		<3.0	9.0
	910826		<64	<32
	920714		<1.1	7.6
	930719		<1.0	3.2
	980811		<0.2	4.1
	001011		<0.6	3.5
	001121			3.6
	001228		1.2	3.4
	010329		0.6	EMPC
	010525		<1	<.1
	010803		1.4	2.1
REGIONAL WASTE SYST	890111	ash	5.5	28.0
PORTLAND	890112	ash	6.0	24.0
	890113	ash	10.0	50.0
	890114	ash	10.0	20.0
	890121	ash	6.0	90.0
	900211	ash	E20	210.0
ROBINSON MANUFACTUR	870113		10.1	17.5
OXFORD	880419		<0.4	<0.2
	881004		<7.3	<9.6
	890119		<0.39	<1.2
	890119D		<2.1	<1.1
	910226		<3.0	<3.0
	910305		<3	<0.3
	910308		<3	<3
	910323		<5	<5
	910323		<3	<3
	920610		<1.2	<1.0
	960216		<1	0.1
	960315		<1	4.2
	970220		<1	<1
	980218		<1	<1
SABATTUS WWTP	010412		<2	<2

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
SAPPI -SOMERSET	861217		<2	47.0
	870519		13.0	21.0
	870930			
	871215		60.0	
	880325		27.0	88.0
	880630	EPA	67.0	33.0
	881014		40.0	98.0
	881220		54.0	177.0
	890303		54.0	92.0
	890629		23.0	53.0
	890926		<.8	16.0
	891205		18.0	52.0
	900314		<18	23.0
	900620		35.0	73.0
	900916		45.0	86.0
	901215		39.5	115.0
	910324		23.1	51.0
	910626		39.4	146.0
	910910		69.9	260.0
	920624		33.0	856.0
	920923		20.0	39.0
	921218		15.0	45.0
	930107		11.0	31.0
	930616		23.0	73.0
	930916		56.0	170.0
	931229		42.0	110.0
	940108		31.0	95.0
	940627		33.0	89.0
	940926		12.0	36.0
	941212		11.0	20.0
	950313		3.6	15.0
	950510		3.3	11.0
	950914		9.6	25.0
	951120	comb	1.2	4.2
	960327		2.0	9.6
	960624		5.1	18.0
	960910		5.2	11.0
	961014		5.2	15.0
	970319		5.5	26.0
	970624		8.5	36.0
			4.9	
	970917		<.71	2.0
	971216		<.28	0.7
	980316		<.79	<6.2
	980527		1.0	2.5
	980928	ıredgin(	6.6	18.0
	981208		<.4	0.7
	990330		<.26	<4.2
	990607		<.4	0.8
	990921		<.48	<5.4
	991215		<.4	1.2
	000131		<.65	1.8
	000607		<.729	2.9
	000926	ıredgin(	1.86	6.8
	001213		<.207	1.4
SAPPI - WESTBROOK	850620		17.2	
	870929		31.0	
	871231		21.0	135.0
	880331		5.6	21.0
	880401		8.7	3.9
	880630		13.0	55.0
	881207		19.0	127.0
			19.0	69.0

APPENDIX 3. TCDD AND TCDF IN SLUDGE FROM WASTEWATER TREATMENT

LOCATION	DATE	%MOIST	TCDD	TCDF
SAPPI - WESTBROOK	890106		<1.8	31.0
	890600		<1.2	13.0
	890600		5.3	35.0
	890600		<.2	0.2
	890600		<.4	8.8
	890600		69.9	60.0
	891031		5.0	30.0
	891130		3.0	30.0
	891231		7.0	50.0
	900131		6.0	20.0
	900228		2.7	24.6
	900331		5.1	33.6
	900430		5.9	34.6
	900531		5.3	25.8
	900630		19.0	26.0
	900730		5.2	20.6
	900831		2.9	12.1
	900930		2.5	10.0
	901231		7.7	35.7
	910917		70.0	275.0
	910331		3.4	21.5
	910630		2.9	19.6
	910930		3.8	14.2
	911231		2.4	25.1
	920331		1.2	19.4
	920505		1.6	10.8
	920821			24.5
	940131		0.9	11.6
	940324			12.3
	940728		2.1	17.3
	941213		5.3	29.2
	950329		1.2	20.0
	950602		1.0	10.1
	950911			18.3
	951120		1.1	23.3
	960327		2.0	9.6
	990113		4.0	61.0
	990407		2.9	36.0
	990728		1.0	14.0
	990830		<0.9	4.0
	990928		<1.0	2.8
S PORTLAND STP	880000		<8.65	<48
	900314		<5.3	<3.5
	900314		<2.7	<5.4
	910508			<10
	910531		<5	
	920401		<1.0	<0.8
	920428		<0.8	1.4
	920714		0.9	6.4
	930324		<2.8	<2.8
	940315		<1.0	3.9
	941005		8.7	48.0
	950405		<1	3.3
	960610		<1	5.3
	970616		<1	15.0
	000912		<1	2.6
	010918		<1	1.8
WELLS SANITARY DIST	011109		<0.4	0.9
YORK SD	010806		<1	<1
VAN BUREN WWTP	000918		0.6	4.0

D=duplicate analysis

APPENDIX 4

TCDD AND TCDF IN EFFLUENT FROM

MAINE WASTEWATER TREATMENT PLANTS

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE	TCDD (pg/l)	TCDF (pg/l)
ANSON MADISON	920408	<3	<3
	921001	<3	20
BREWER	920624	<5.9	
	930429	<3.9	
	941129	7.4	
	950503	<3.6	
	960416	<10	
	000501	<10	
FORT JAMES OLD TOWN	880630	39	
	890131	27	120
	890222	210	340
	890223	92	290
	890224	77	340
	890320		34
	890324		24
	890325	36	73
	890405	30	110
	890410	17	52
	890411	32	89
	890824	32	94
	890831	13	150
	890911	<4.1	14
	890915	<3.3	<8.1
	890921	<5.7	13
	890927	<5.3	9.7
	891011	<3	11
	891019	<5.2	14
	891102	<6	18
	891106	6.7	22
	891114	<9.5	<7.1
	891127	<6.4	20
	891206	<8.4	13
	891213	<8.3	20
	891221	<4.7	23
	900105	<6.8	<8.3
	900111	<9	<8.5
	900118	<5.9	6.1
	900125	<6.7	10
	900207	<4.6	17
	900214	<6.6	23
	900222	<7.3	15
	900301	<6	11
	900308	<3	12
	900315	<4	16
	900329	<7.4	14
	900407	<7.2	24
	900502	<7	19
	900729	<9.9	49

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
FORT JAMES	910330		17	70
OLD TOWN	910430		19	65
	910530		9.5	41
	910630		6.8	43
	910830		11	66
	911030			7.9
	911130		<7.7	<16
	920330		<5.7	50
	920730		16	69
	920830		<4.9	23
	921030		<3.0	
	921230		4.8	
	930130		<5.0	14
	930330		<4.9	12
	930530		<4.2	11
	930630		<2.8	15
	930830		<1.6	9.2
	930930		<3.5	7.6
	931130		<3.1	32
	931230		<3.2	19
	940230		<4.8	7.7
	940330		<4.6	12
	940530		<1.5	<4.5
	940630		<3.5	9.2
	940830		<2.0	<4.8
	940930		<4.6	<6.8
	941130		<9.5	<10
	941230		<1.1	5.8
	942730		<1.1	5.8
	950130		<2.4	8.2
	950119		<2.4	8.2
	951230		<1.1	5.8
	950430		<1.4	5.6
	950430		8	36
	950421		<1.4	5.6
	950622		<2	6.8
	950928		<3.8	8.1
	951129		<5.4	13
	951228		<1.4	6.2
	980115	BPA	<2.8	<5.8
		BPB	<11	53
	980130		<3	9.4
		BPA	<2.9	18
		BPB	<2.8	8.9
	980219	BPA	<1.7	12
		BPB	<3.9	39
	980230		<2.6	8.7
	980328	BPA	<5.8	11
		BPB	<5.2	13
	980330		<2	9.1
	980730		<3	<4

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
FORT JAMES	980830	BP	<3.5	BP	<4.2
OLD TOWN	980930		<3.2		<4.8
		BP	5.9	BP	28
	981030		<3.2		<4.8
		BP	<3.5	BP	<4.2
	981130		<5.5		<5.4
		BP	<3.4	BP	<4.6
	981230		<1.6		8.7
		BP	<3.1	BP	6.5
	990130		<3.4		<2.6
		BP	<3	BP	<3.9
	990230		<10		<10
		BP	<10	BP	<10
	990330	BP	<2.3	BP	<1.8
	990530		<1.9<4.7		<2.9<3.3
		BP	<3.2	BP	<4.8
	990630		<1.3		<1.8
		BP	<2.3	BP	7.3
	990730		<.93		<1.4
		BP	<2.6	BP	<1.8
	990930		<.68		<2.1
		BP	<1.3	BP	<5
	991030		<2.5		<2.1
		BP	<3	BP	<3.6
	000130		<8.4		<4.9
		BP	<9.0	BP	<5.4
	000330		<3.4		<3.1
		BP	<2.9	BP	<2.3
	000430		<7.4		<7.6
		BP	<5.0	BP	<5.5
	000630		<2.2		<1.5
		BP	<4.0	BP	<3.0
	000830		<1.2		<1.1
		BP	<3.0	BP	<3.2
	001030		<2.3		<2.6
		BP	<3.4	BP	<3.4
	001130		<2.7		<1.4
		BP	<2.7	BP	<3.2
	010130		<3.3		<2.1
		BP	<3.9	BP	<3.1
	010330		<4.7		<3.2
		BP	<2.4	BP	<4.5
	010530		<2.9		<2.5
		BP	<6.7	BP	<5.4
	010630		<1.7		<1.5
		BP	<3.2	BP	<3.2
	010730		<2.0		<1.5
		BP	<2.7	BP	<2.2
	010930		<3.2		<2.5

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
FORT JAMES		BP	<2.3	BP	<1.7
OLD TOWN	011130		<4.7		<3.9
		BP	<3.4	BP	<2.6
DOMTAR	880101		6.8		25
Baileyville	900316		<5		4
	900423		<3		<6
	900531		<8		<5
	900619		<3		<1
	900716		<1		<3
	900807		<2		<5
	910630		<10		<10
	910630		<10		<10
	910630		<11		<11
	910630		<11		<11
	910630		<11		<11
	910630		<11		<11
	910630		<10		<10
	910630		<11		<11
	910630		<11		<11
	911231		<10		<10
	911231		<10		<10
	911231		<11		<11
	911231		<11		<11
	911231		<10		<10
	911231		<11		<11
	911231		<10		<10
	911231		<11		<11
	911231		<11		<11
	930408		<10		<10
	930506		<10		<10
	930713		<10		<10
	940530		<10		<10
	941222		<10		<10
	950331		<10		<10
	950630		<10		<10
	950930		<10		<10
	951231		<10		<10
	980330				60
	980421		<10		60
	980825		<10		40
		BP	<10	BP	10
	981230		<10		<10
		BP	<10	BP	<10
	990430		<10		<10
		BP	<10	BP	<10
	990930		<4		<3
			<2		<6

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
DOMTAR		BP	<2ALK<4ACID	BP	<2ALK<7ACID
Baileyville		BP	<5ALK<3ACID	BP	<4ALK<3ACID
	991030		<5		<3
		BP	<7ALK<5ACID	BP	<8ALK<3ACID
	991130		<1		<6
		BP	<1ALK<2ACID	BP	<5ALK<3ACID
	000130		<4.2		<3.4
		BP	<2.0ALK<2.0ACID	BP	<4.0ALK<3.0ACID
			<5.0		<4.0
		BP	<3.0ALK<3.0ACID	BP	<3.0ALK<2.0ACID
	000930	BP	<7.1ALK<3.4ACID	BP	<5.6ALK<2.4ACID
		BP	<2.3ALK<2.5ACID	BP	<1.6ALK<1.7ACID
	001200	BP	<5.9ALK<3.8ACID	BP	<5.3ALK<2.1ACID
		BP	<5.1ALK<4.0ACID	BP	<4.0ALK<3.0ACID
INTERNATIONAL PAPER	880101		88		420
	880715		30		150
	890307		30		100
			E6		E20
			E20		E20
	890310		16		74
	890616		<8		980
	890621		17		140
	890713		<16		50
	890720	DEP	30		150
	890818		20		110
	900413		<10		90
	910924		<10		60
	910926		<10		60
	911129		50		210
	911219		<20		<80
	920125		20		110
	920126		20		110
	920127		30		100
	920128		30		100
	920129		13.7		49.9
	920312		19.3		65.6
	920320		14.8		73.9
	920423		<13.9		59.1
	920610		<5.7		29.5
	920617		<6.3		30.8
	920723		<8.4		33.6
	920819		6.6		29.7
	920923		<2.6		<2.0
	921111		<6.1		22.4
	921202		<2.6		<14.4
	930125		5.4		19.6
	930222		<5.3		25.5
	930420		<2.0		16.7
	930527		4.3		10.3
	930716		<5.2		28.9

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
INTERNATIONAL PAPER	930826		<5.3, <6.5		21.5, 19.2
	930910		<8.6		9.4
	931022				19.5
	931119		<3.6		19.5
	931224		10.9		31.1
	940125		<4.1		21.6
	940226		7.3		38
	940422		7.7		41.1
	940520		4.1		25.6
	940722		<3.4		16.7
	940829		<7.9		31.8
	941027		<3.4		25.3
	941125		<6.8		24.4
	950126		<5.0		20.9
	950222		<3.6		21.4
	950420		<2.5		25.6
	950527		<1.8		24.1
	950724		<3.2		16.1
	950826		<4.9		7.5
	950929		<6.0		15.4
	951020		<8.5		12.9
	951122		<3.8		10.5
	960228		<10		6.5
	960430		<10		12.8
	960530		<10		15.7
	961030		<10		7.7
	961130		<10		<10
	970130		<10		<10
	970228		<10		11.5
	970330		<10		<10
	970330	BPA	<6.2	BPA	<6.3
		BPB	<5.1	BPB	<3.7
	970430		<10		14.4
	970522	BPA	4.9	BPA	5.6
		BPB	10.9	BPB	9.6
	970406	BPA	<4.9	BPA	10.9
		BPB	<5.6	BPB	9.6
	970630		<10		6.8
	970730		<10		<10
	970728	BPA	<5.2	BPA	11.5
		BPB	<5.4	BPB	6.3
	970830		<10		<10
	971030		<10		
	971013	BPA	<4.3	BPA	<5
		BPB	<7.2	BPB	<8.3
	971130		<10		
	980117		<2.1		7.1
	980126	BPA	<3.5		<3.2
		BPB	<1.2		<1.7
	980221		<3.7		<3.7
	980406	BPA	<0.6		<2.3

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
INTERNATIONAL PAPER		BPB	<1.4	<1.3
	980516		<3	8
	980613		<1.4	<2.2
	980706	BPA	<2.8	19
		BPB	<1.2	4.8
	980711		<2.3	4.9
	980814		<2.2	<1.1
	981012	BPA	<2.0	45
		BPB	<2.9	<1.6
	981016		<2	5.1
	981116	BPA	<6.8	9.9
	981119		<7	<8.6
	981130	BPB	<3.3	<5.2
	990117		<2.8	3.6
	990112	BPA	<.99	54
		BPB	<.97	4
	990312		<3	7.4
	990304	BPA	<2.1	9.7
		BPB	<2.7	<5.9
	990412		<5.9	18
	990408	BPA	<2.6	7.4
		BPB	<5.5	<5
	990618		<5.1	<4.2
	990622	BPA	<8.6	<9
		BPB	<3.3	<4.1
	990723		<2.2	<1.6
	990720	BPA	<2.9	130
		BPB	<2.5	<2.3
	990917		<6.2	<6.5
	990913	BPA	<3.8	<1.6
		BPB	<3.4	<1.4
	991008		<5.6	6.6
	991005	BPA	<2	<1.6
		BPB	<3	<1.3
	991112		<2.7	<6.5
	991110	BPA	<2.7	<4
		BPB	<2.1	<2.1
	000104	BPA	<2.5	<1.8
		BPB	<3.0	<2.8
	000306	BPA	<1.6	<5.0
		BPB	<1.1	<2.6
	000419	BPA	<2.9	<1.6
		BPB	<2.7	<1.8
	000612	BPA	<3.7	<2.6
		BPB	<1.51	<0.59
	000705	BPA	<2.43	<4.57
		BPB	<2.07	<1.8
	000829	BPA	<2.28	<3.57
		BPB	<1.69	<2.20

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
INTERNATIONAL PAPER	001019	BPA	<0.573		<1.91
		BPB	<0.698		<1.61
	001207	BPA	<1.80		<1.89
		BPB	<0.825		<1.19
HARTLAND	960530		<0.06		
KIMBERLY-CLARK	930308		<10		<12
	930623		<4.6		<3.9
LINCOLN PULP AND PAPER	881130		32		130
	920817		11.2		69.8
	920908		<11		27.3
	921117		7.7		39.1
	921216		<1.9		9.5
	931230		<5.5		<17.3
	940417		1.9		7.5
	950824		1.3		8.5
	960409		1.3		8.5
	970116	BP	25.4	BP	103
	970212	BP	11	BP	43.1
	970522	BP	11.4	BP	27.6
	970813	BP	6.4	BP	14.4
	971001	BP	1.6	BP	1.9
	971231	BP	<2.4	BP	<3.83
	980330	BP	<3.4	BP	<3.7
	980430	BP	<10	BP	13.2
	980630	BP	<8.9	BP	<4
	980830	BP	<7.1	BP	<7.6
	980930	BP	<2.3<4.1	BP	<2.3<3.2
	981130	BP	<2.6<4.9	BP	<2.7<3.6
	981230	BP	<1.5	BP	<1.3
	990230	BP	<1.1	BP	<2.1
	990330	BP	<2.5	BP	<3.8
	990430	BP	<2.8	BP	<3.2
	990630	BP	<4.4	BP	<4.5
	990830	BP	<4.3	BP	<2.8
	990930	BP	<1.3	BP	<.44
	991030	BP	<2.3	BP	<2.2
	991130	BP	<3	BP	<2.9
	000130	BP	<	BP	<1.4
	000330	BP	<3.0	BP	<1.2
	000430	BP	<1.6	BP	<1.3
	000630	BP	<7.14	BP	<3.63
	000730	BP	<2.07	BP	<1.25
	000830	BP	<2.14	BP	<3.17
	001030	BP	<3.39	BP	<2.17
	001130	BP	<2.08	BP	<
	010228	BP	<2.11	BP	<2.39

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
LINCOLN PULP AND PAPER	010330	BP	<0.56	BP	<0.618
	010530	BP	<3.28	BP	<7.31
	010630	BP	<2.05	BP	<1.97
MEADWESTVACO CORP	880518		120		570
	890301		25		80
	890807		<6		20
	890810		<13		20
	890814		<5		13
	890817		<5		18
	890821		<8		21
	890824		<5		10
	890829		<5		18
	890831		<11		20
	890905		<11		20
	890907		<9		18
	891023		<3		7
	891026		<5		6
	891222		<5		20
	900216		<2		6
	900216		<1		7
	900515		<10		<8
	900515		<1		5
	900627		<3		8
	900627		<3		9
	920217		<4.6		14
	920221		<4.6		13
	920311		<4.6		9.9
	920316		3.2		8.7
			3.5		12
			4.6		17
	920326		4.5		8.5
	920412		6.3		24
	920613		<4.6		6.8
	920708		<4.6		<5.8
	920831		<4.6		3.5
	920904		<3.8		
	921104		<3.7		
	921201		<2.4		
	930105		<2.4		
	930201		<2.4		<10
	930401		<2.8		<10
	930501		<2.4		<10
	930701		<3.9		12
	930801		<2.8		<3.4
	931001		<3.2		<10
	931101		<3.9		<3.6
	940130		<2.8		<5.2
	940219		<1.9		<1.3
	940417		<3.3		<2.4

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
MEADWESTVACO CORP	940509		<3.6		<1.2
	940728		<3.7		<1.7
	940829		<2.7		<2.0
	941024		<2.1		<1.1
	941205		<2.7		<1.8
	950131		<10		<10
	950229		<10		<10
	950430		<10		<10
	950531		<10		<10
	950731		<10		<10
	950831		<10		<10
	951031		<10		<10
	951130		<10		<10
	960130		<10		<10
	960330		<10		<10
	960430		<10		<10
	960530		<10		<10
	960730		<10		<10
	960830		<10		<10
	961030		<10		<10
	961130		<10		<10
	970317		<10		<10
	980130		<10		<10
	980230		<10		<10
	980430		<10		<10
	980530		<10		<10
	980609	BP	<10		<10
	980730		<10		<10
	980830	BP	<10		<10
	981030	BP	<10		<10
	981130	BP	<10		<10
	990130		<10		<10
		BP	<10	BP	<10
	990230		<10		<10
		BP	<10	BP	<10
	990430		<10		<10
		BP	<10	BP	<10
	990530		<10		<10
		BP	<10	BP	<10
	990730		<10		<10
		BP	<10	BP	<10
	990830		<10		<10
		BP	<10	BP	<10
	991030		<10		<10
		BP	<10	BP	<10
	991130		<10		<10
		BP	<10	BP	<10
	000113	BP	<10	BP	<10
	000224	BP	<10	BP	<10
	000410	BP	<10	BP	<10
	000505	BP	<10	BP	<10

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
MEADWESTVACO CORP	000718	BP	<10	BP	<10
	001003	BP	<10	BP	<10
	001106	BP	<10	BP	<10
	010112	BP	<10	BP	<10
	010201	BP	<10	BP	<10
	010408	BP	<10	BP	<10
	010502	BP	<10	BP	<10
	010711	BP	<10	BP	<10
	010808	BP	<10	BP	<10
	011009	BP	<10	BP	<10
	011102	BP	<10	BP	<10
SAPPI - SOMERSET	880630		16,19		63,100
	900710		<7.1		8.4
	900716		<6.1		5.9
	dup		<5.5		<7.3
	900724		<3.6		<3.9
	930105		<3.4		9.2
	930224		<4.7		15
	930311		<4.0		10
	930409		6.8		18
	930616		6.3		14
	930917		7		17
	931203		7.6		19
	940107		<3.8		9.2
	940624		<10		13
	940923		<11		8.7
	941209		<4.6		6.6
	950310		9		11.6
	950505		<10.3		6.6
	950616		<3.9		<9.4
	950807		5.8		14.5
	950911		2.8		15.3
	951124		<4.2		38.7
	951208		<7.4		29
	960112		<1.6		<2.3
	960209		<3.2		<4.8
	960405		<2.7		<2.7
	960610		<3.6		6.5
	960712		<3.0		4.2
	960809		5.8		15
	961108		<4.9		11
	961206		<4.1		9.7
	970103		<4.3		6.2
	970207		<2.0		7.5
	970411		<2.2		5.7
	970509		8.2		12
	970708	BP	<3.0		
	970711		<3.2		<2.9
	970805	BP	<2.9		
	970807	BP	<3.5		

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)	TCDF (pg/l)
SAPPI - SOMERSET	970815		<3	<3.3
	970820	BP	<3.7	
	980825	BP	<2.3	
	970916	BP	<2.6	
	971017		<9.1	<6.3
	971114		<3.8	<0.51
	980109		<3.5	<1.9
	980112	BP	<3.2	
	980206		<4.3	<2
	980410		<1.6	<1.6
	980608		<5.7	<1.7
	980810		<1.6	<2.5
	980911		<1.9	<2
	981009		<1.9	<1.9
	981106		<2.2	<1
	990210		<1.5	<1.2
	990310		<2.6	<2
	990410		<4.6	<3.3
	990510		<3.4	<4.5
	990710		<3.5	<3.9
	990910		<7.3	<6
	991010		<4.1	<6.1
	991110		<2.2	<1.1
	000204		<3.4	<4.7
	000310		<3.1	<3.1
	000407		<3.3	<3.3
	000505		<5.7	<4.5
	000728		<2.24	<1.22
	000908		<4.34	<4.67
	001110		<0.556	<1.13
	001208		<3.61	<3.09
SAPPI - WESTBROOK	880101		6.3	
	1989		1	
	901118		<3	8
	910425		<5	<5
	910716		<8	<5
	911203		<8	<5
	920218		<2.8	7
	920507		<1.2	4.6
	920715		<5.8	<4.9
	921114		<1.8	3.9
	930303		<7.8	16
	930617		<1.5	<6.4
	930915		<2.4	5.7
	931208		<3.4	<7.3
	940130		<6.5	<9.8
	940324			<5.9
	940727		3.6	7.8
	941212		<6.0	<15.8
	950730		<5.4	9.8

APPENDIX 4. 2378-TCDD AND 2378-TCDF IN EFFLUENT FROM WASTEWATER TREATMENT PLANTS

SOURCE	DATE		TCDD (pg/l)		TCDF (pg/l)
SAPPI - WESTBROOK	950615		<2.8		<9.9
	950815		<4.3		<21.9
	970519	BP	<7.9	BP	<10
	970808	BP	5.05	BP	<8.2
	971002	BP	<	BP	13.46
	980324		<1.6		5.9
	980914	BP	13.4	BP	130
	980915		<1.0		11
	980921		<1.9		<1.9
		BP	<10	BP	110
	981118		<10		<10
		BP	<10	BP	130
	981208	BP	<10	BP	140
	981209		<11		<11
	990113		<10		<10
	990131				<11
		BP	10	BP	140
	990209		<10		<10
	990318		<10		<10
	990331				<10
		BP	<11	BP	150
	990407		<10		<10
	990526		<11		15
	990617		<10		<10
	990630				15
		BP	<11	BP	130
	990728		<9.5		<9.5
	990731	BP	<10	BP	54
	990830		<10		<10
	990830		<10		<10

APPENDIX 5

2378-TCDD AND 2378-TCDF IN SEDIMENTS

FROM VARIOUS STATIONS ON THE ANDROSCOGGIN RIVER

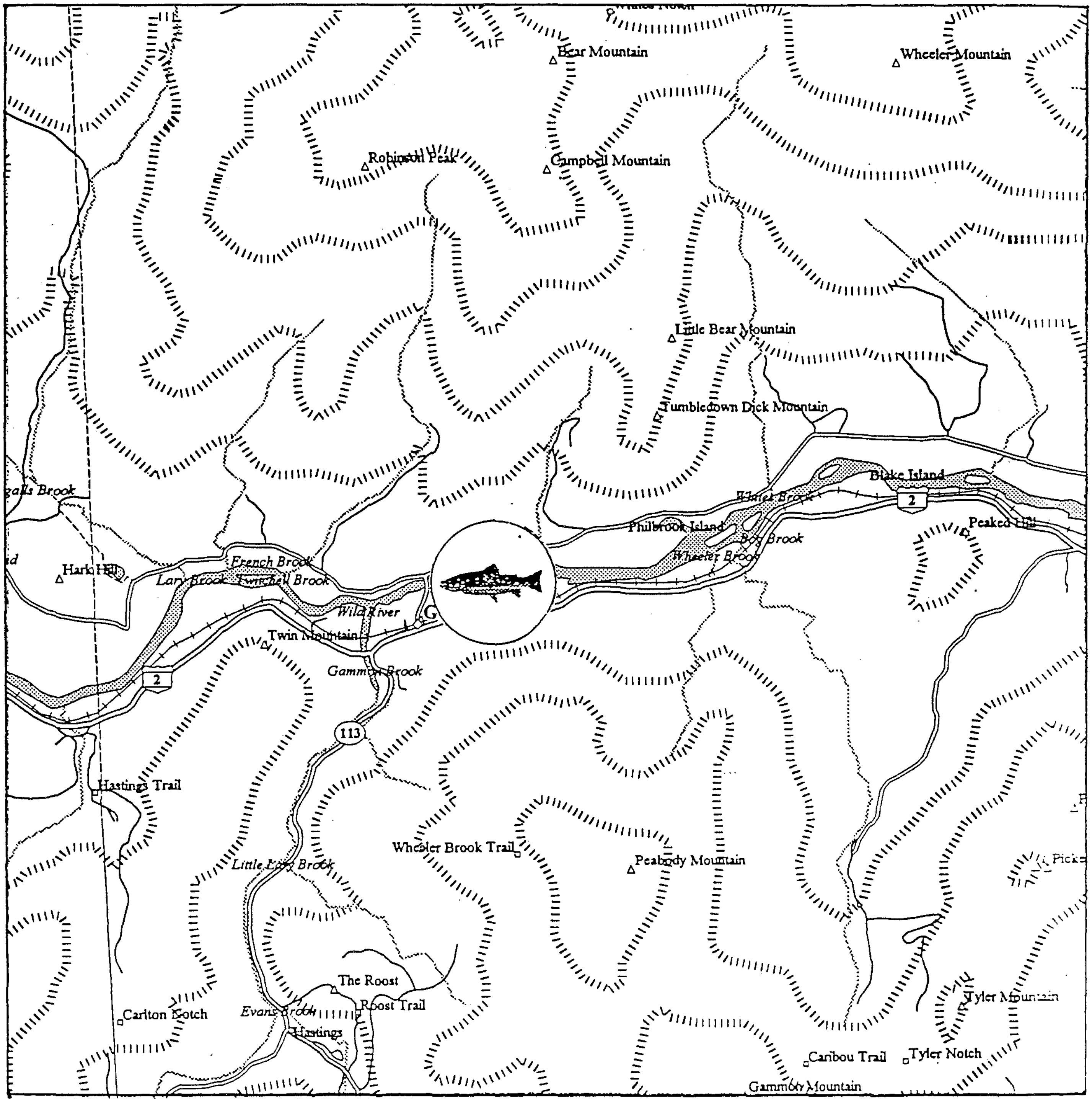
APPENDIX 5. 2378-TCDD AND 2378-TCDF IN SEDIMENTS FROM STATIONS ON THE ANDROSCOGGIN R

LOCATION	DATE	2378-TCDD	2378-TCDF	% MOISTURE	% DOC
Virginia Impoundment Rumford N443147 W703217	910308	4.4	185		2.35
Riley Impoundment Jay N443002 W701458	910306	5.3	168		3.31
Otis Impoundment Livermore Falls N442846 W701213	910327	E6.8	162		2.85
Gulf Island Pond Turner N441520 W701050	850711	23.1			
Gulf Island Pond Turner N441420 W701125	850711	30.3			
Gulf Island Pond Turner N441225 W701210	850711	20.4			
Gulf Island Pond Greene N441040 W701240	850711	39.5 42.6dup			
Gulf Island Pond Greene N440932 W701222	910313	27.4	371		6.79
Worumbo Impound. Lisbon Falls N435950 W700405	910327	4.7	64.2		2.31
Brunswick below dam N435445 W695550	850711	2.5			
Brunswick Cow Island N435520 W695745	850711	1.7			

APPENDIX 6

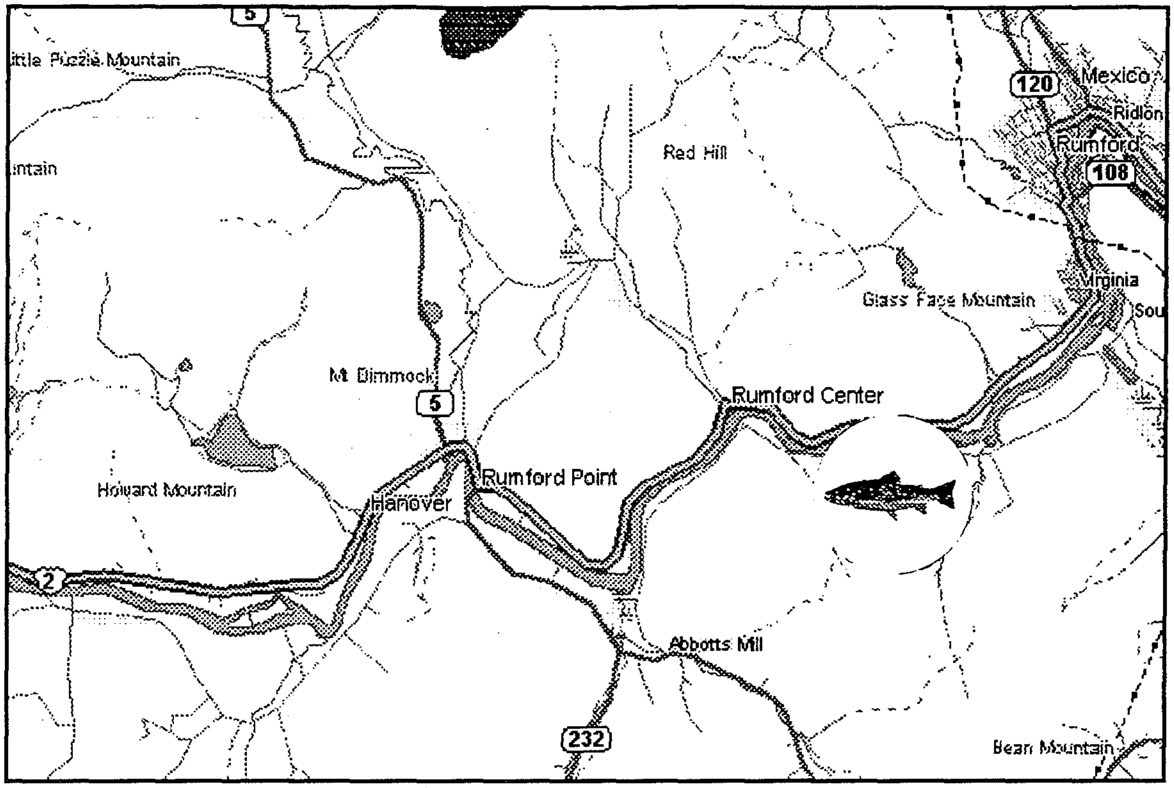
SAMPLE LOCATION MAPS

AGL ANDROSCOGGIN RIVER AT GILEAD

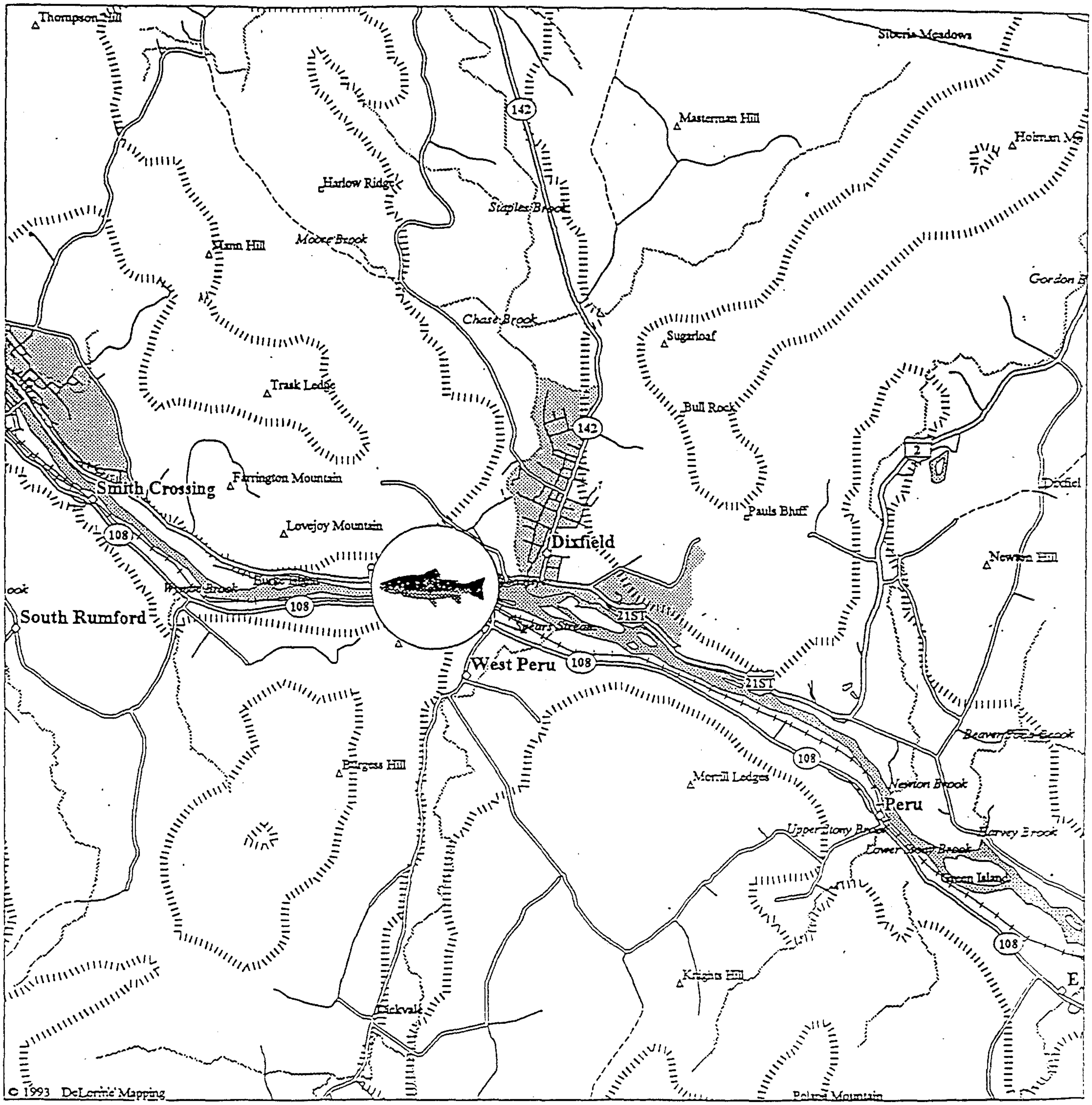


Androscoggin River at Rumford Point

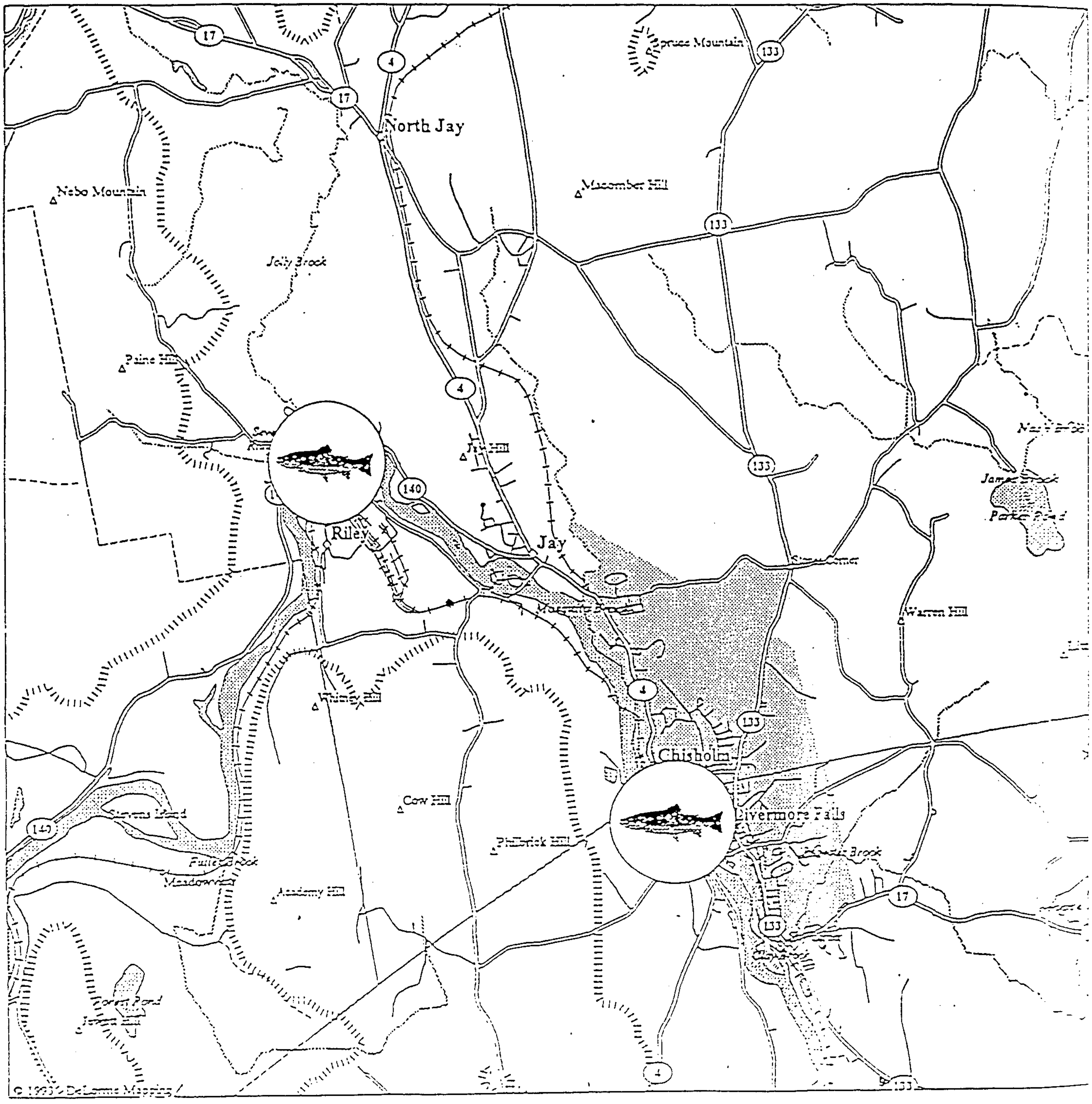
ARP



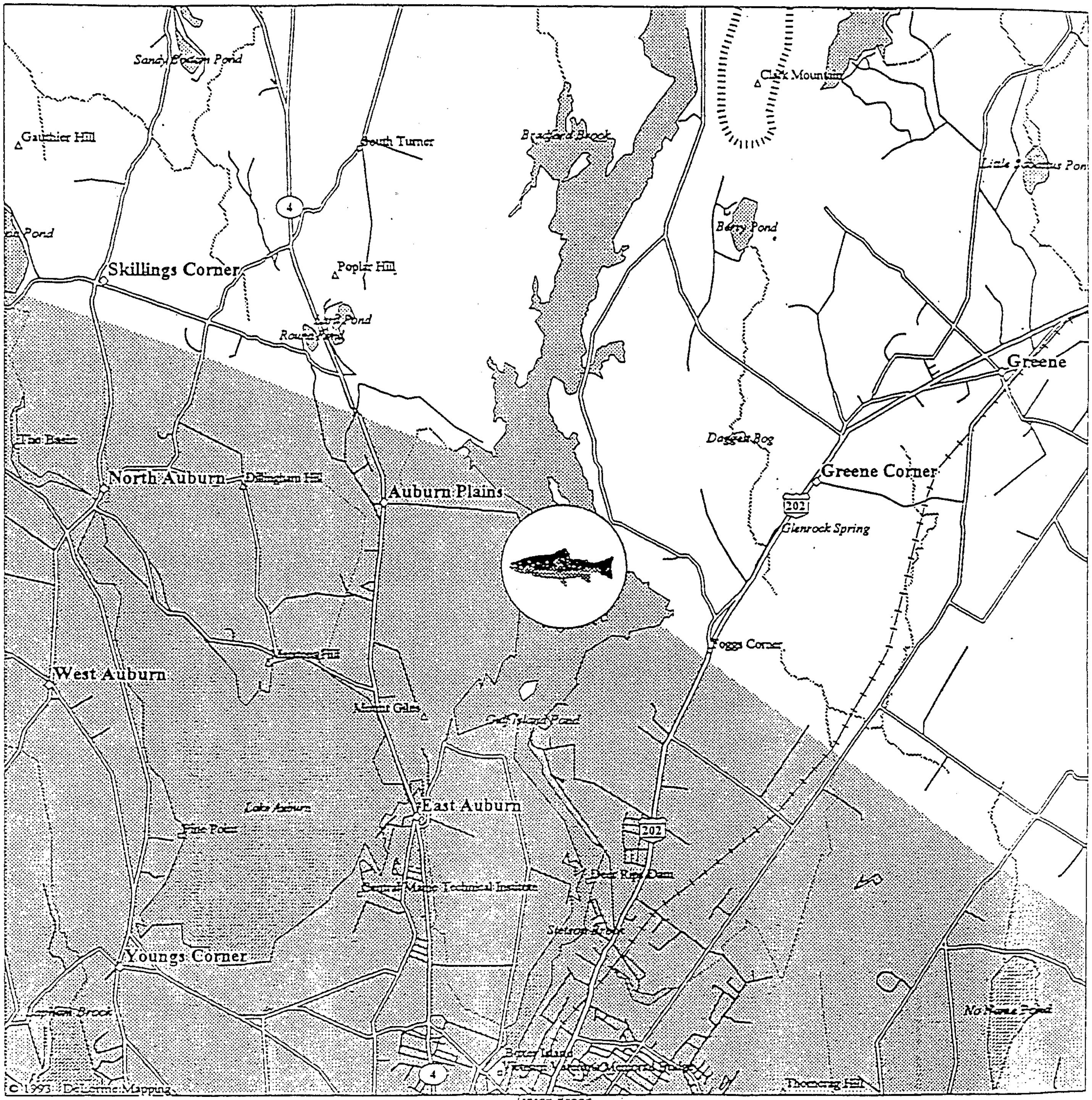
ARF ANDROSCOGGIN RIVER AT RUMFORD



ALV ANDROSCOGGIN RIVER AT LIVERMORE FALLS
ARY ANDROSCOGGIN RIVER AT RILEY

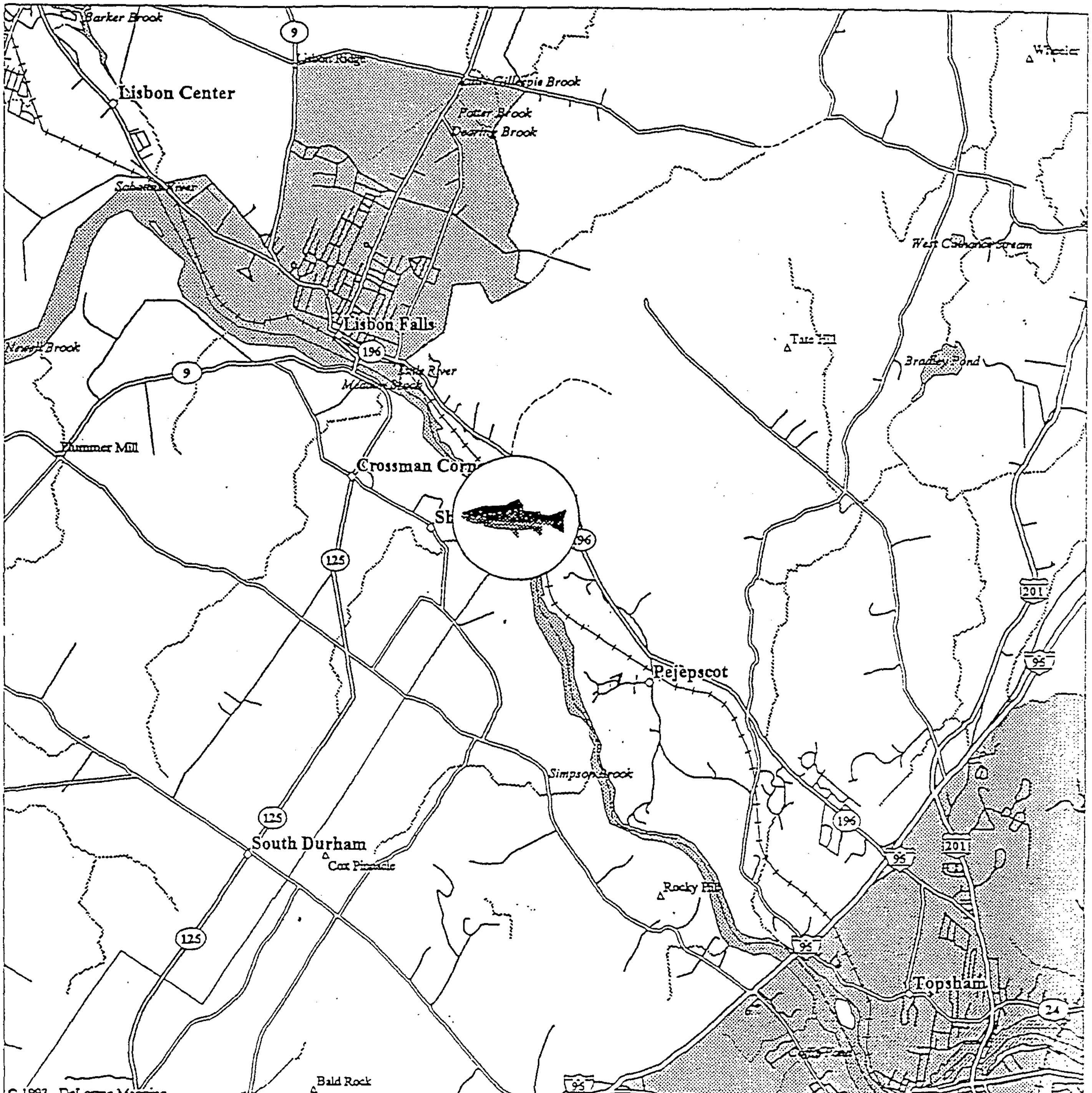


AGI ANDROSCOGGIN RIVER AT GULF ISLAND POND, AUBURN

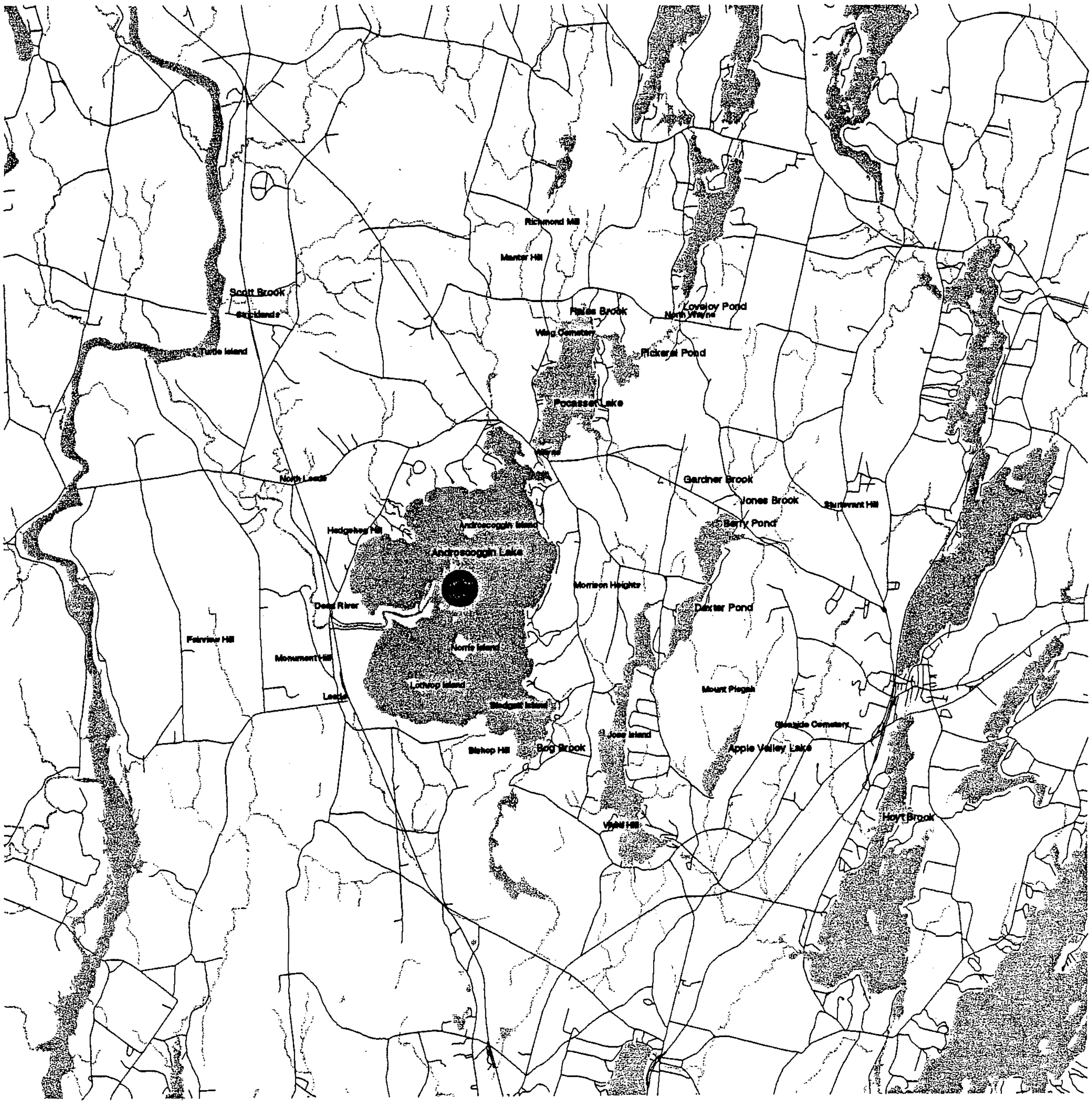


ALS

ANDROSCOGGIN RIVER AT LISBON FALLS



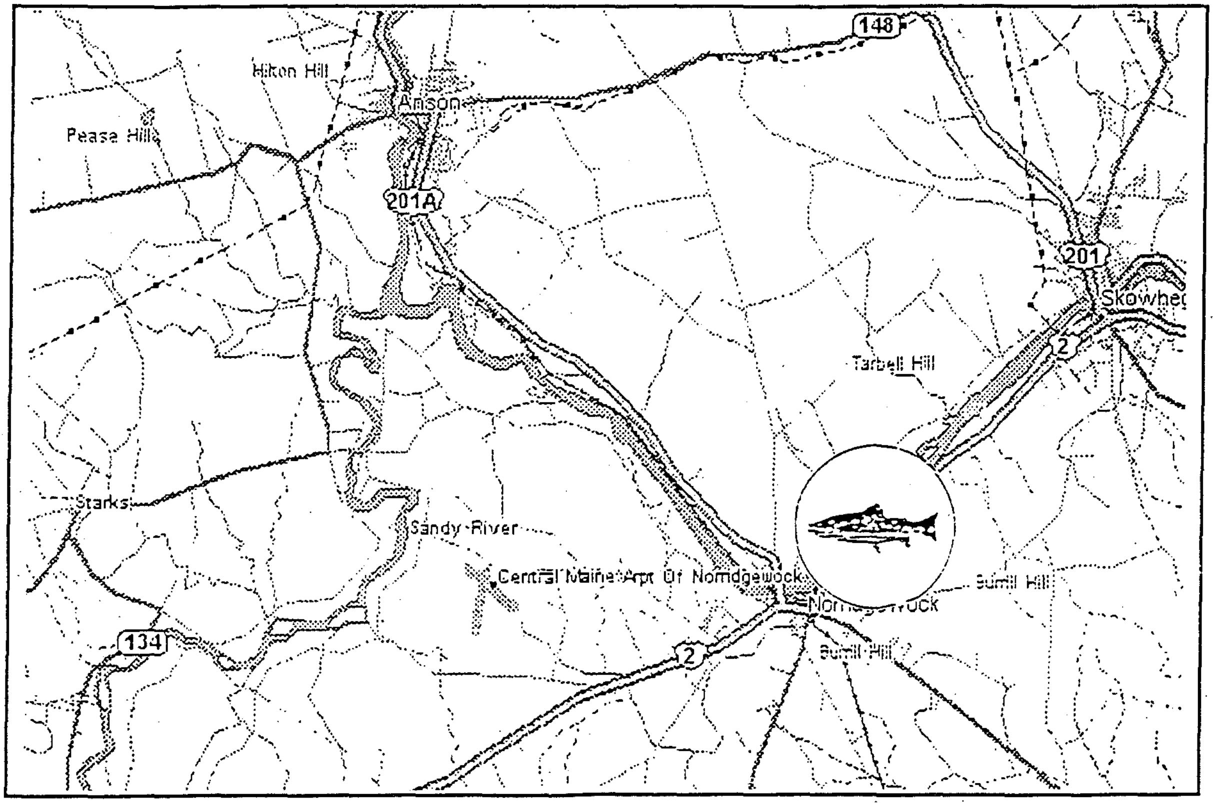
ALW Androscoggin Lake



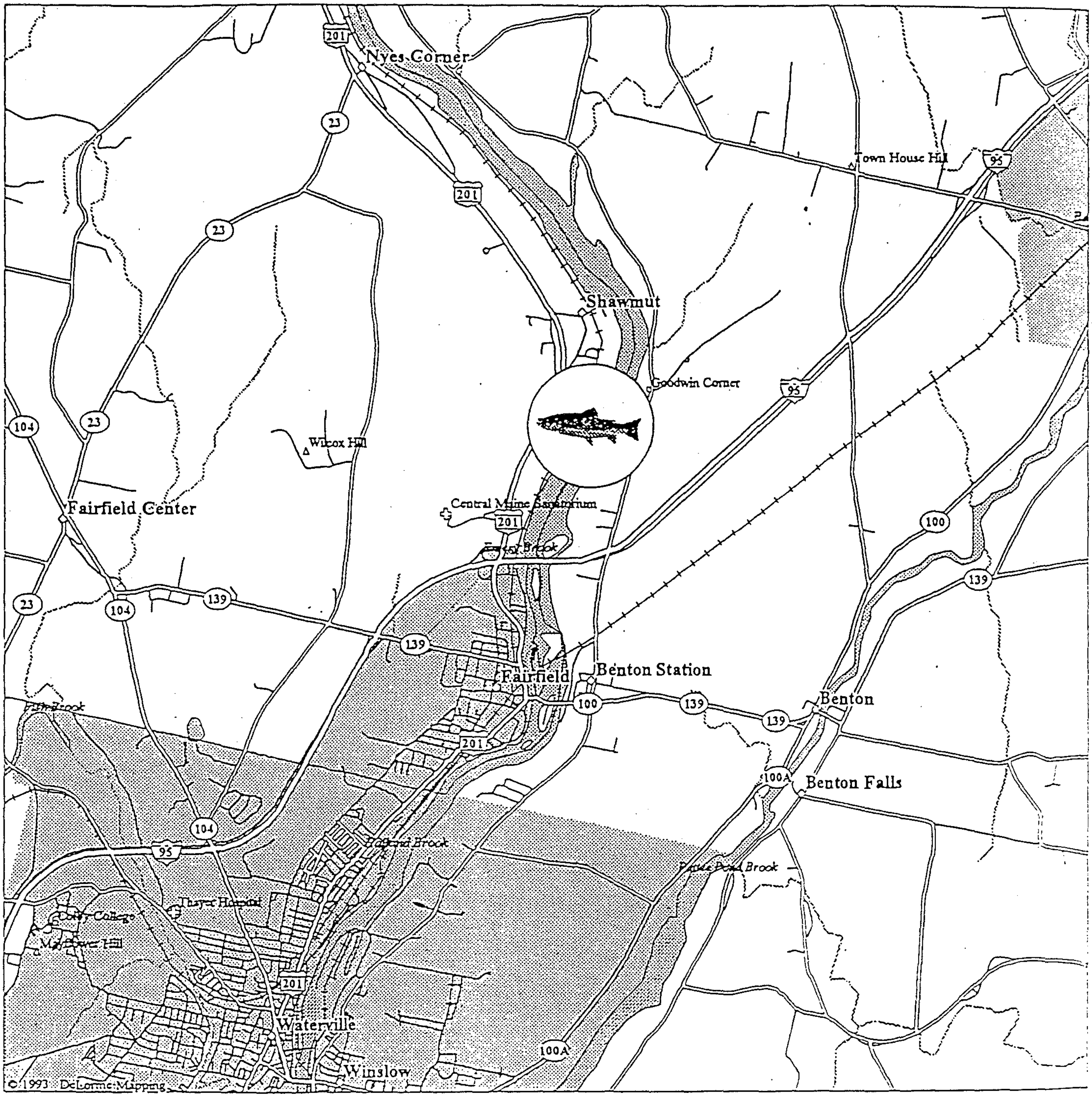
MDEP BL&WQ DEA

Kennebec River
Norridgewock

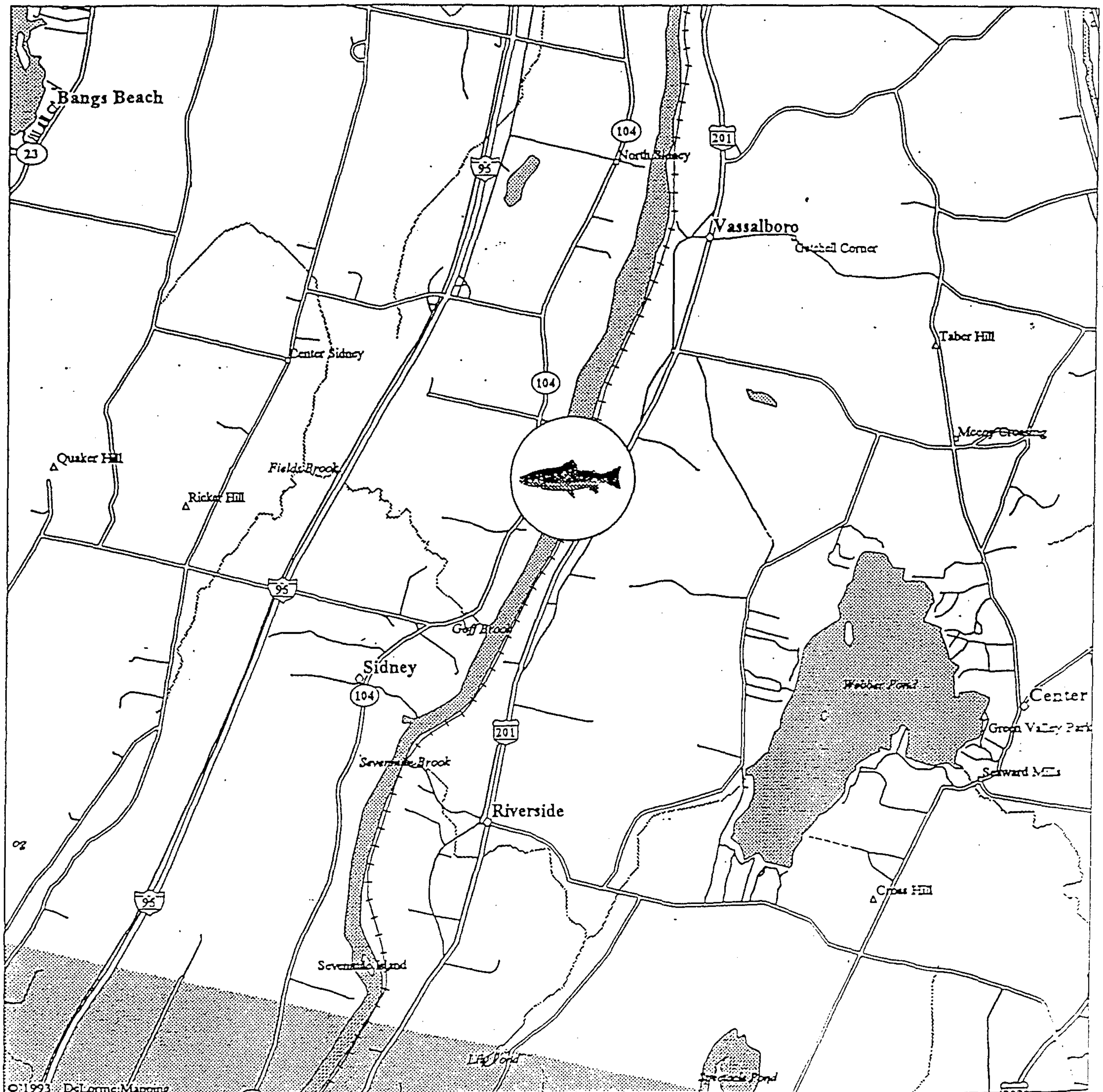
KNW



KFF KENNEBEC RIVER AT SHAWMUT, FAIRFIELD



KSD KENNEBEC RIVER AT SIDNEY

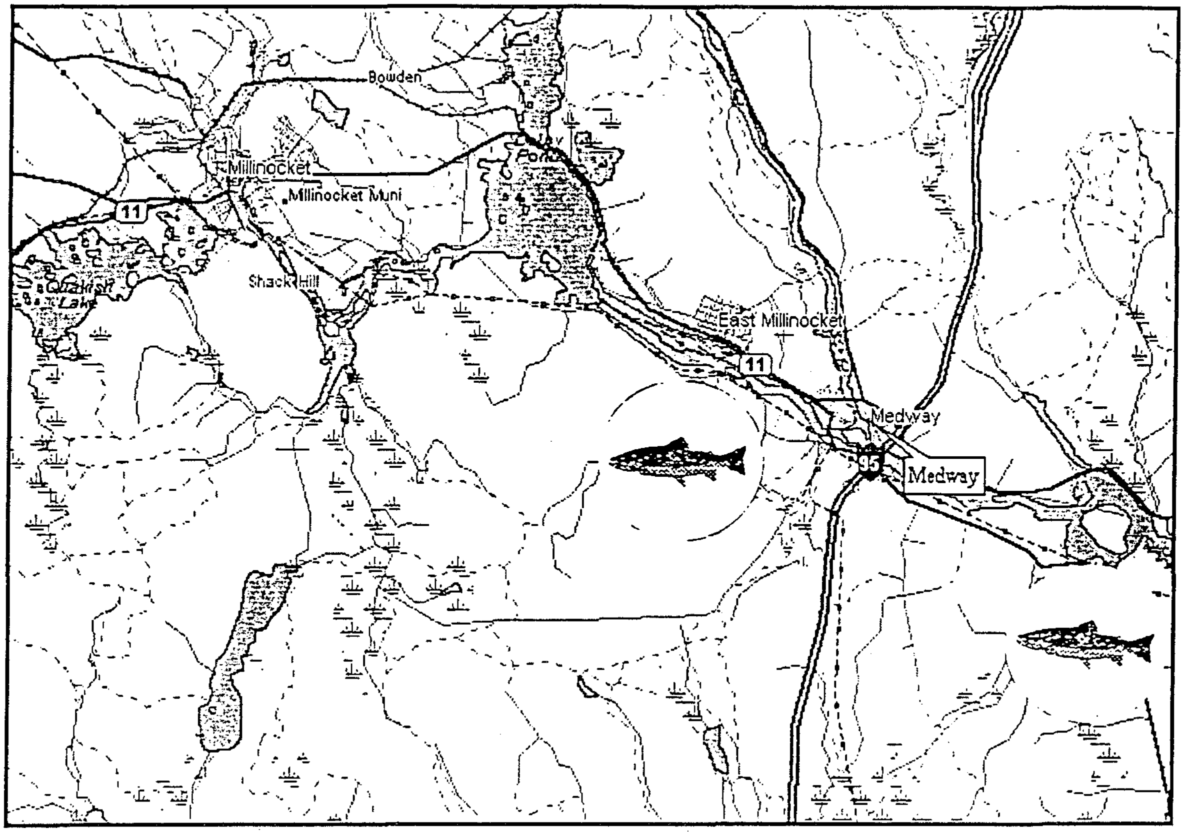


PBR

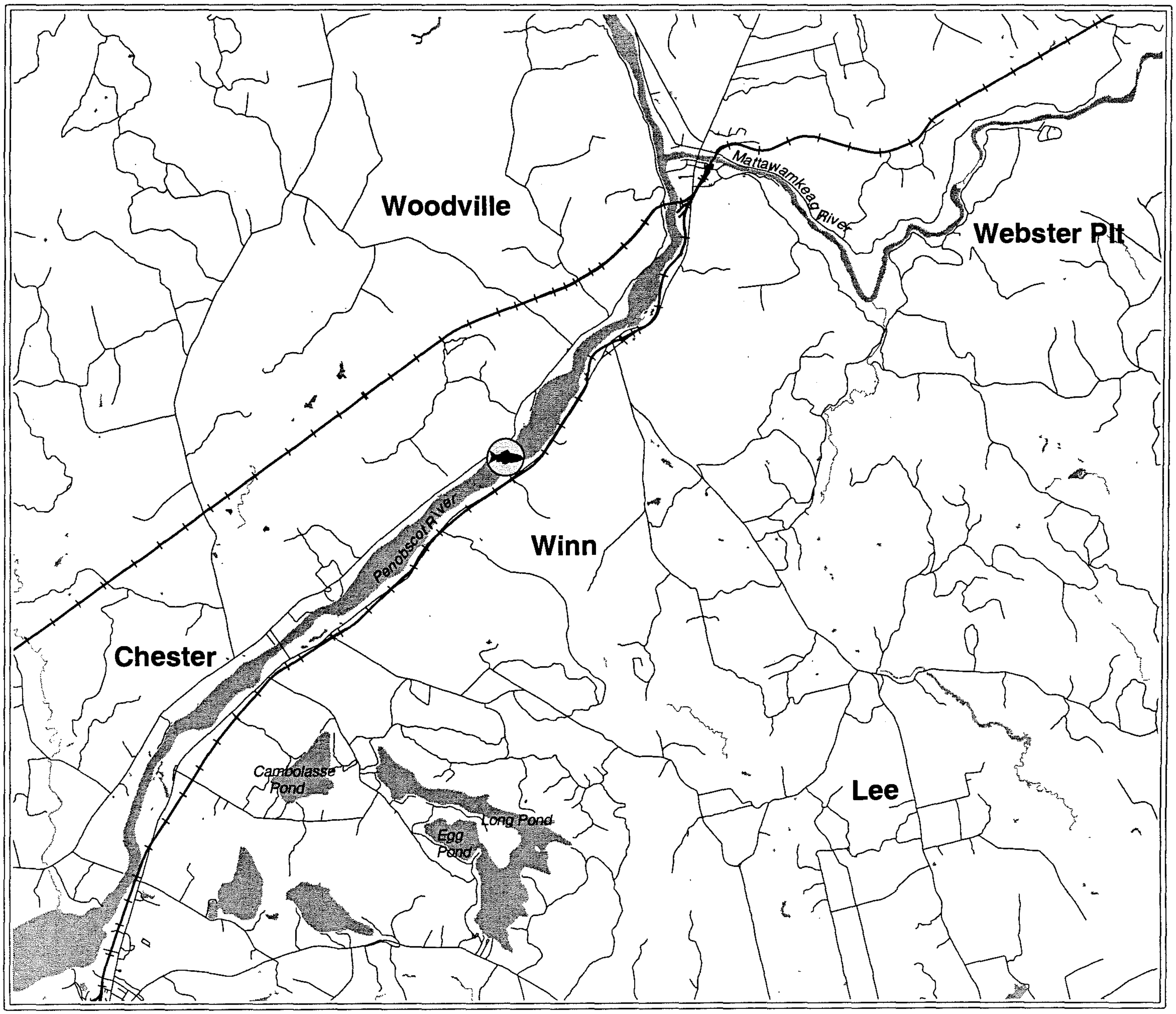
Penobscot River
E.Millinocket

PBW

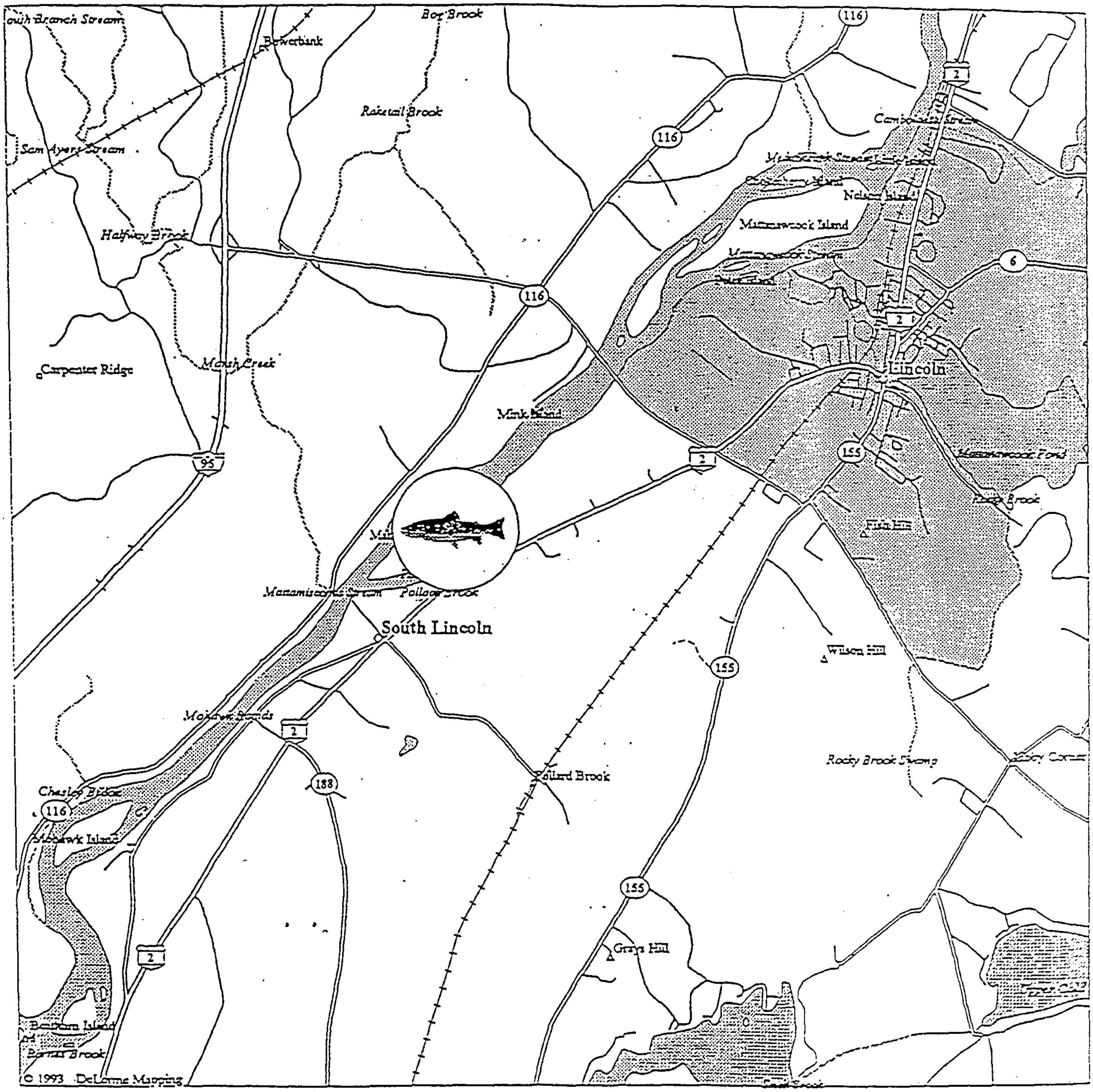
Penobscot River
Woodville



PBM (PBN) PENOBSCOT RIVER AT WINN

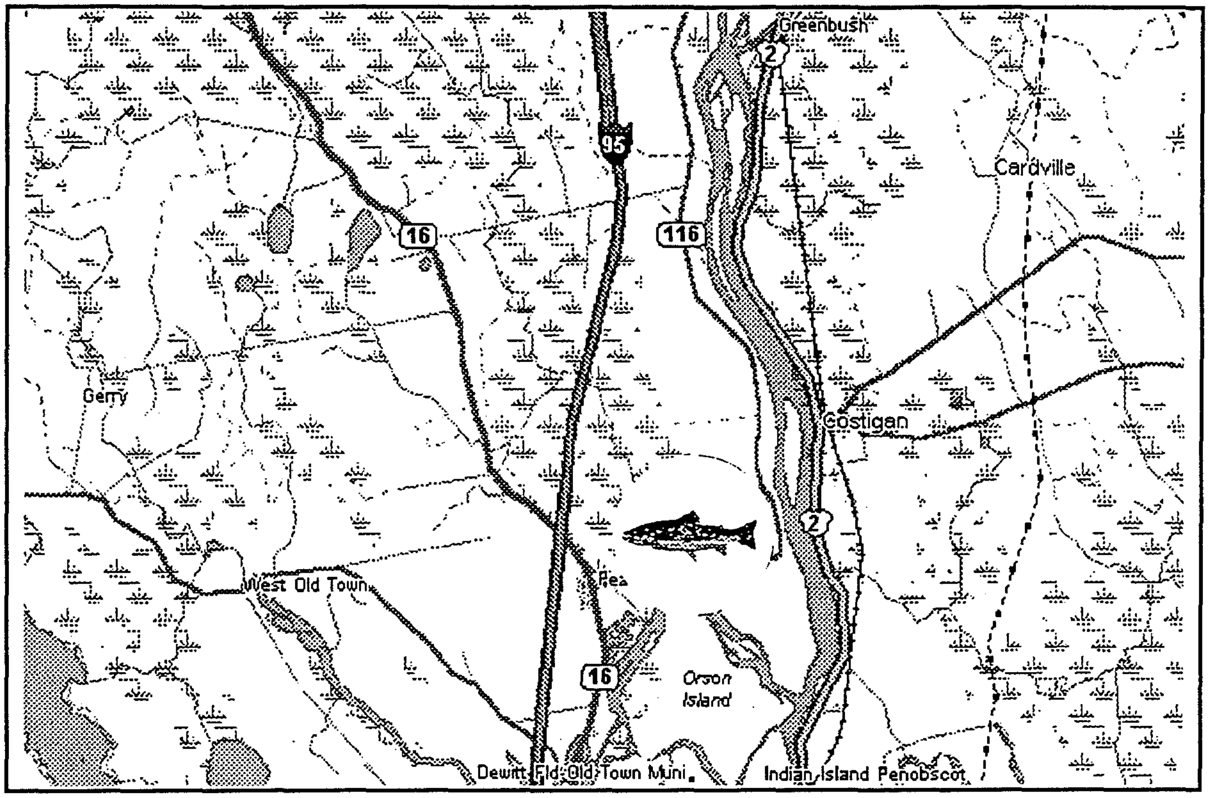


PBL PENOBSCOT RIVER AT SOUTH LINCOLN

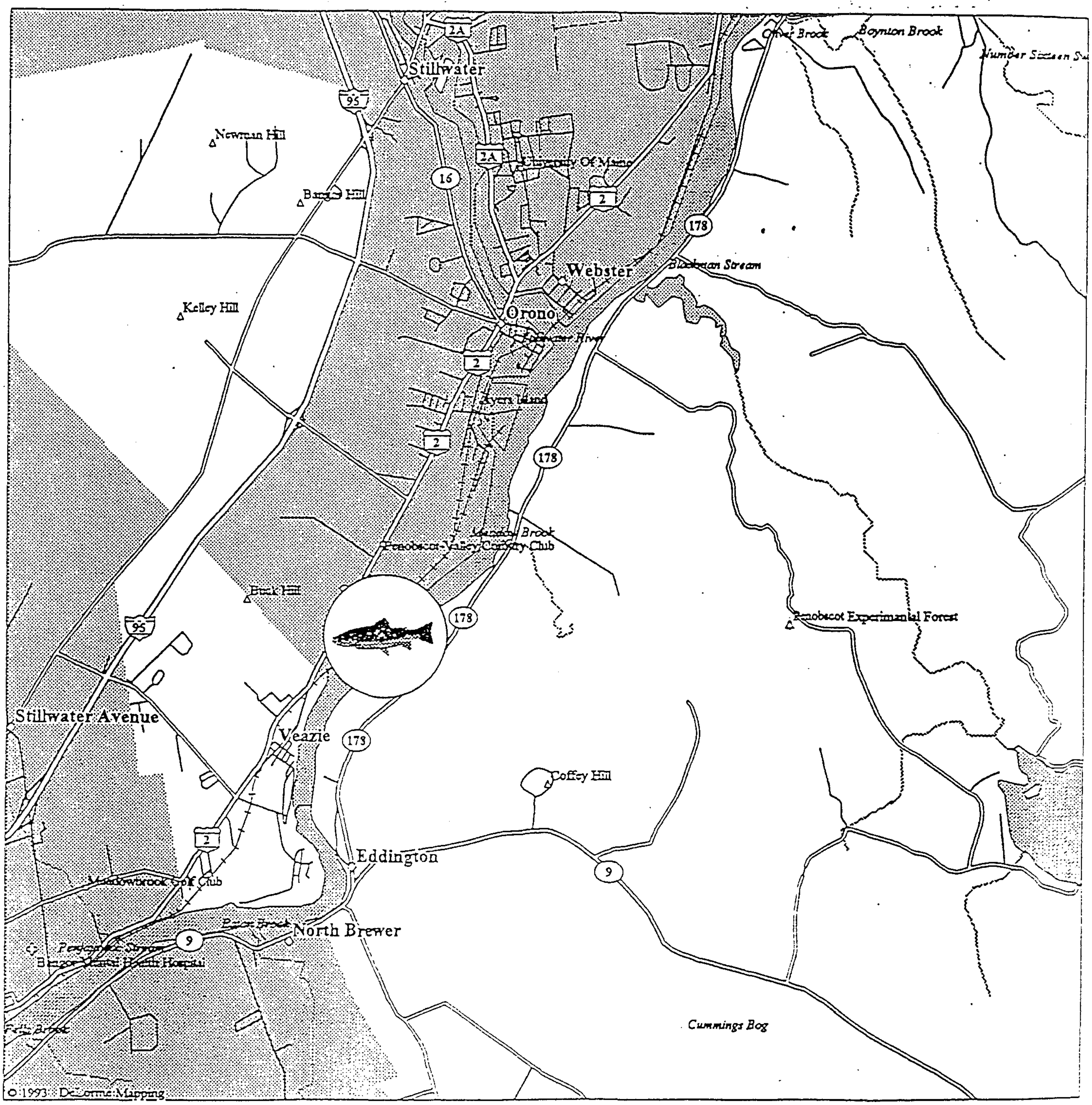


Penobscot River
Costigan

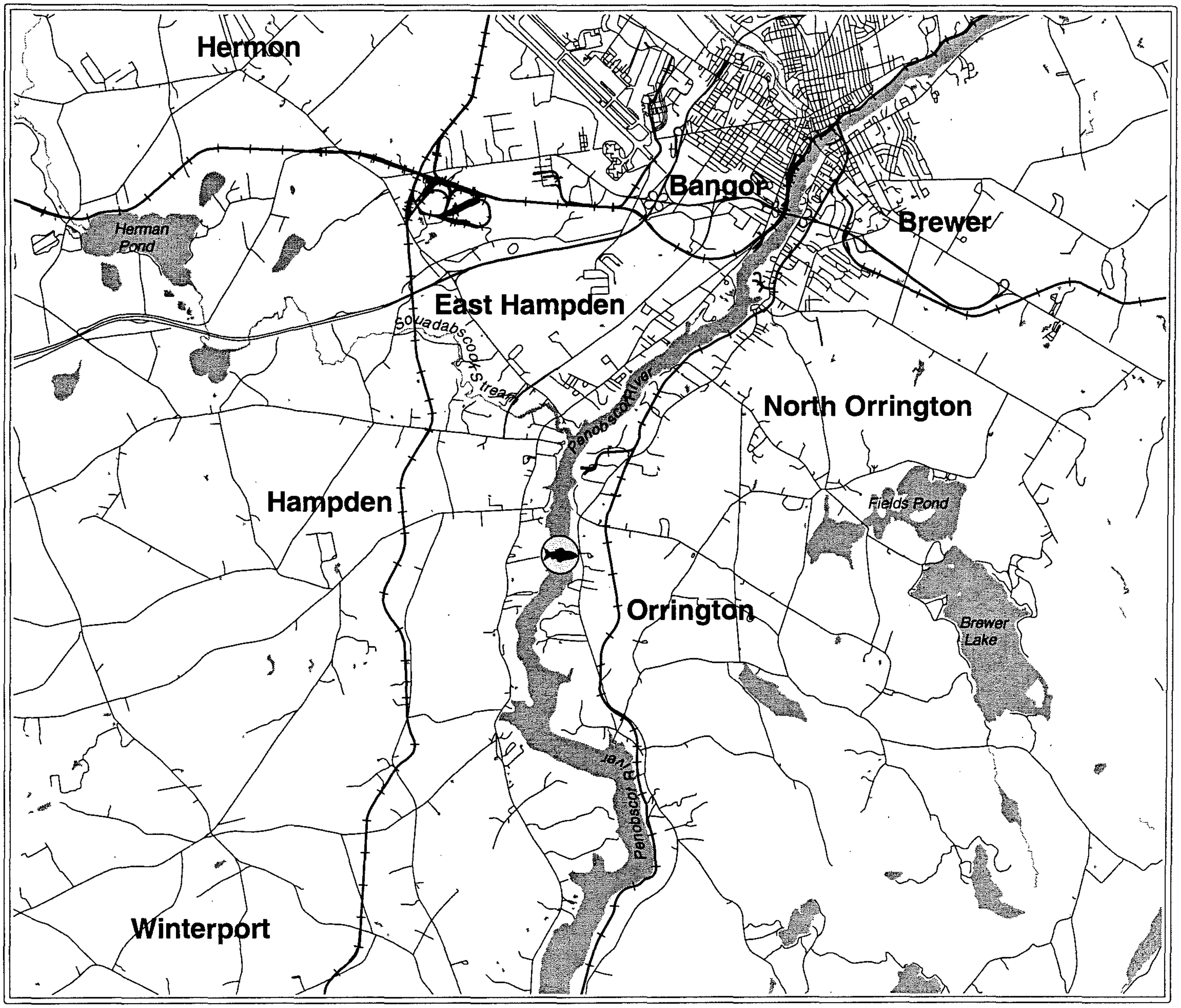
PBC



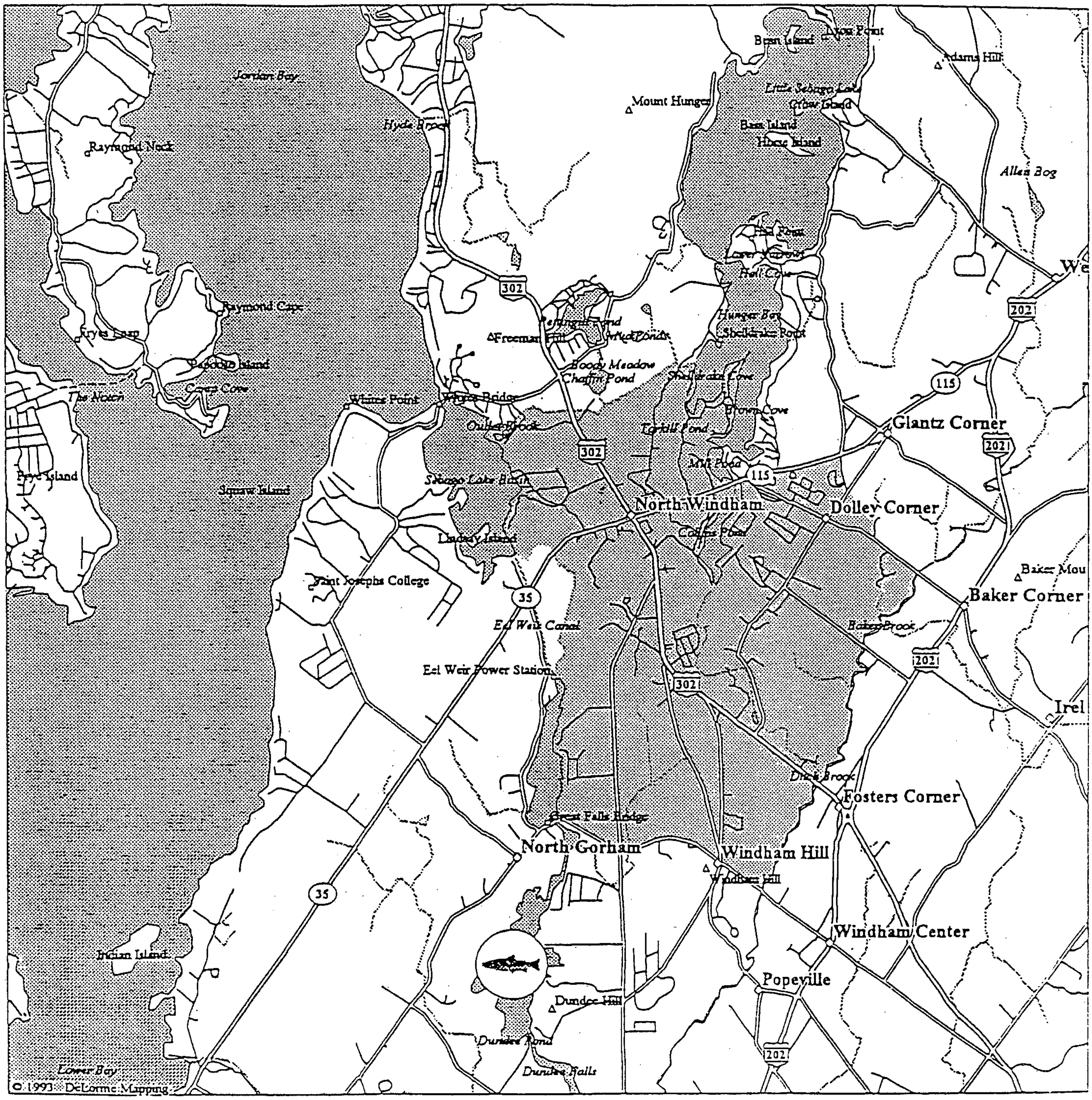
PBV PENOBSCOT RIVER AT VEAZIE



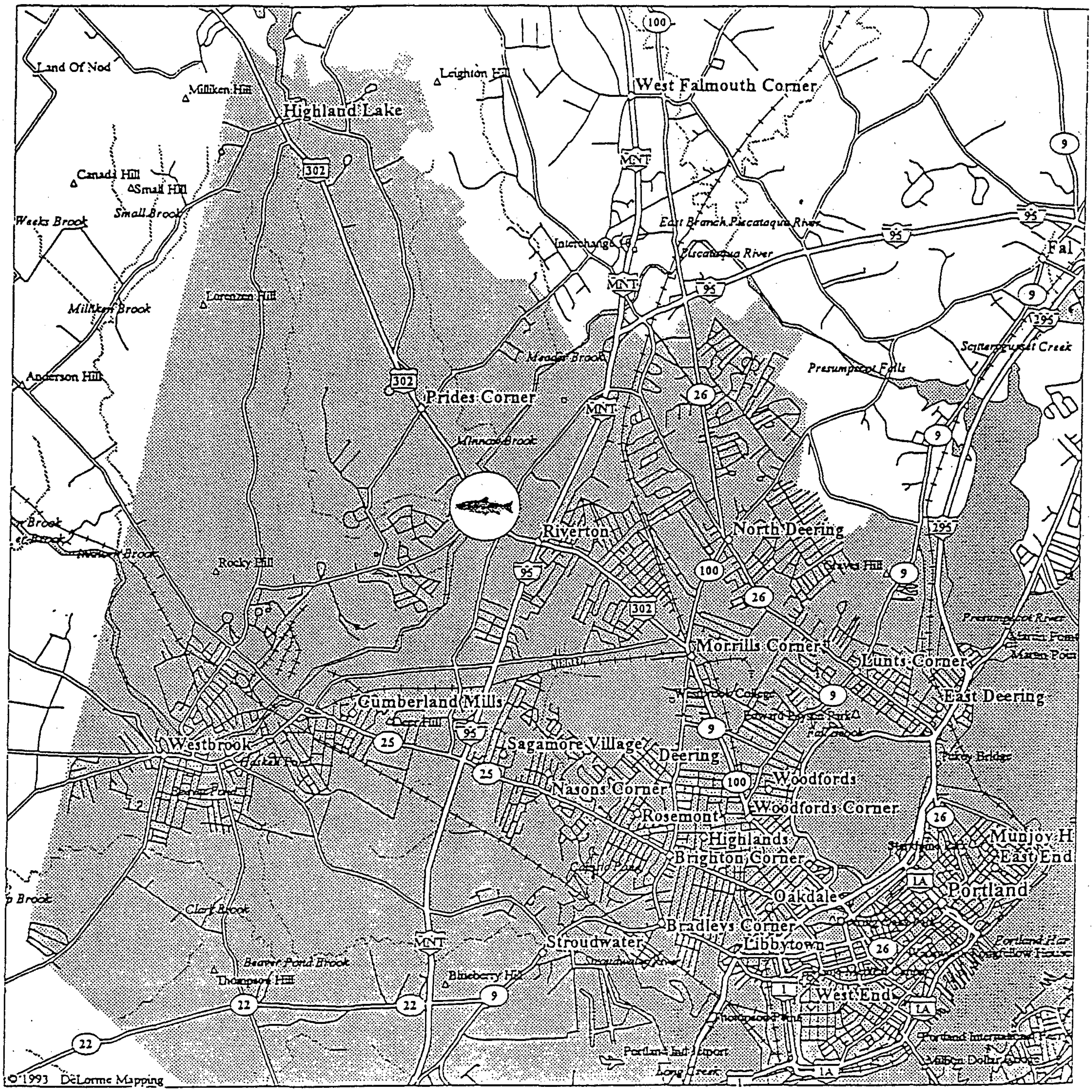
PBB PENOBSCOT RIVER AT ORRINGTON



PWD PRESUMPSCOT RIVER AT WINDHAM

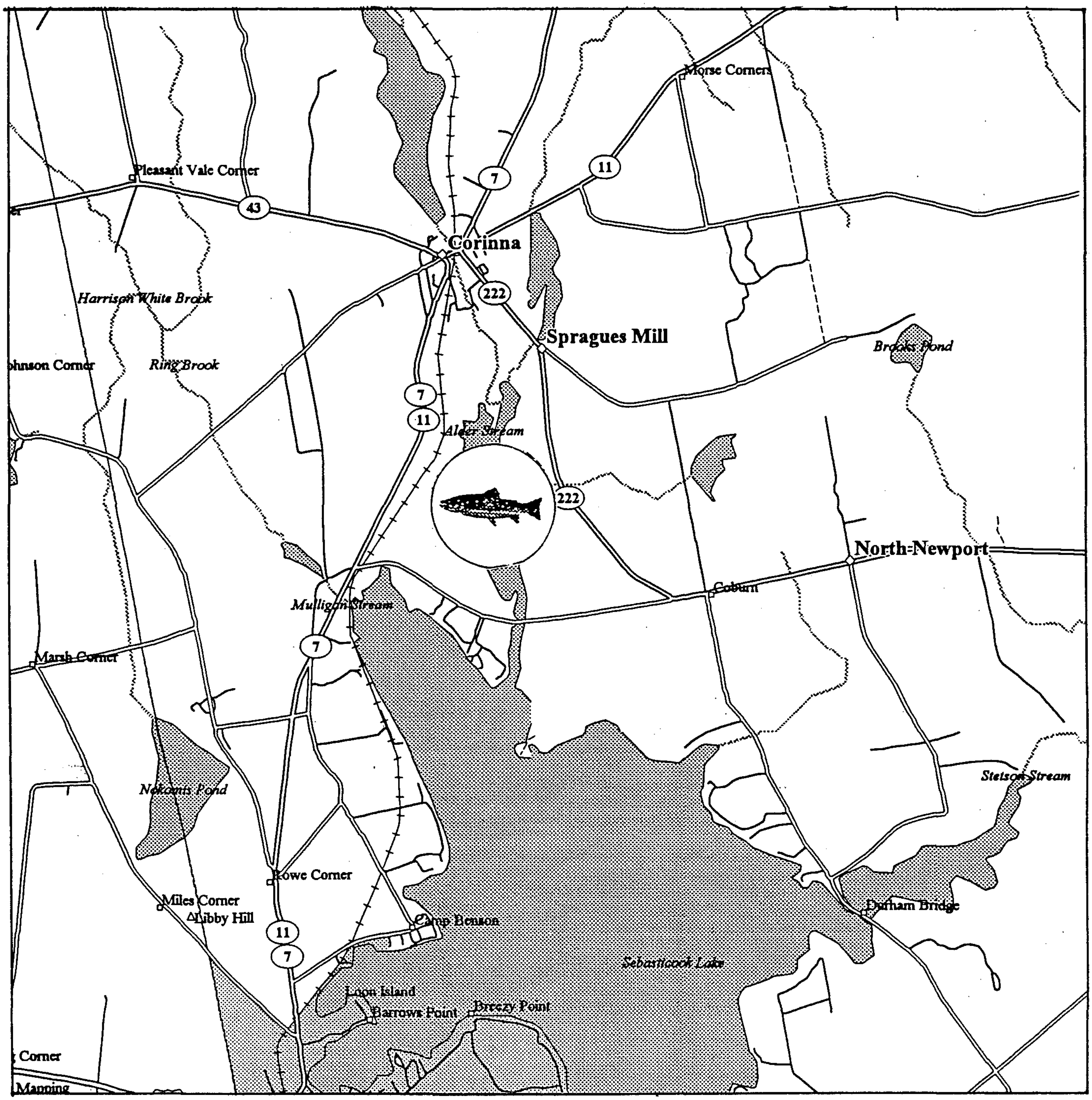


PWB PRESUMPSCOT RIVER AT WESTBROOK

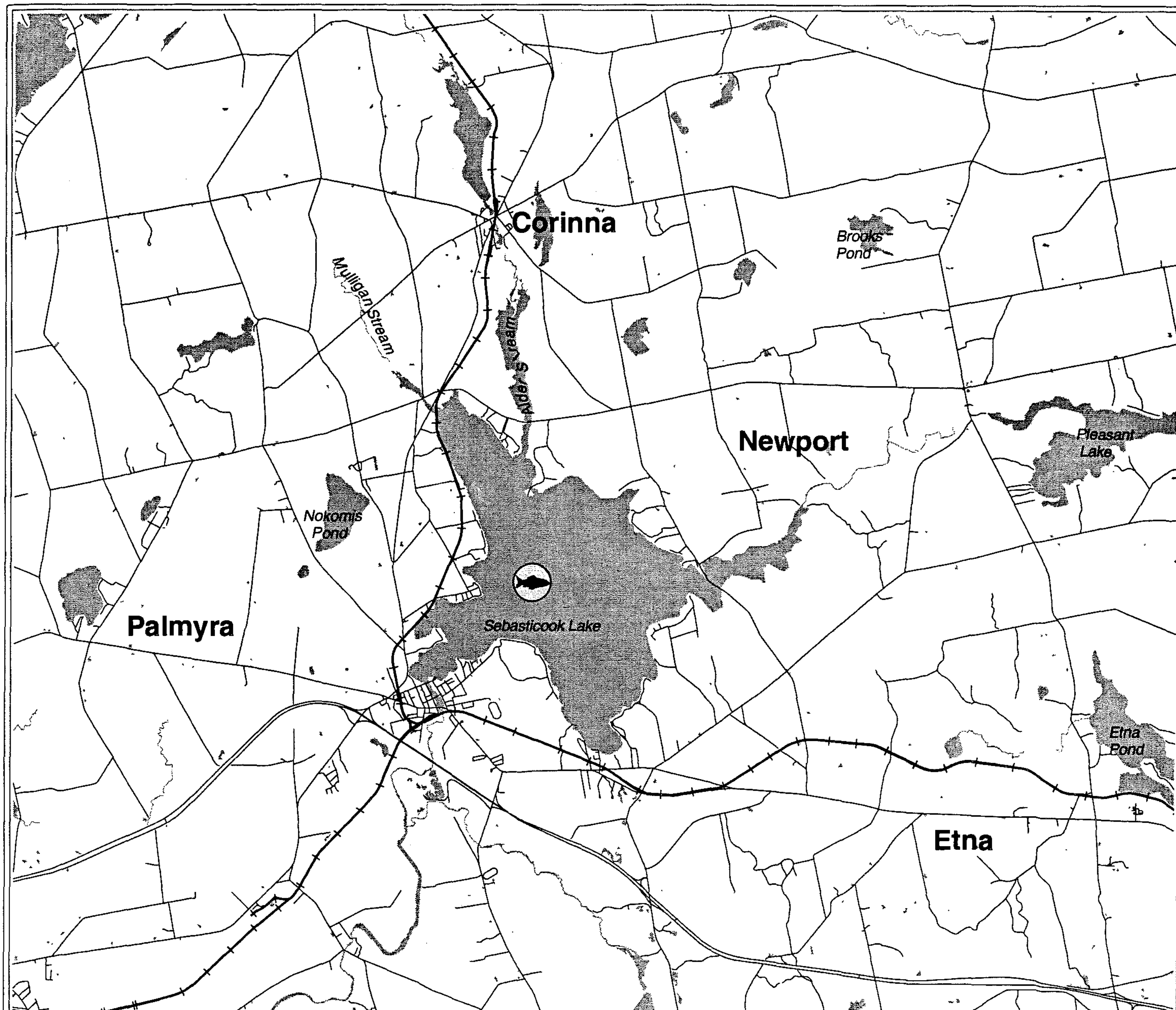


SFS SALMON FALLS RIVER AT SOUTH BERWICK

SEN E.BR.SEBASTICOOK RIVER AT NEWPORT



SLN SEBASTICOOK LAKE AT NEWPORT



SED EAST BRANCH SEBASTICOOK R AT DETROIT

SWP W BR SEBASTICOOK RIVER AT PALMYRA

APPENDIX 7

LENGTHS AND WEIGHTS

IN 2001 FISH SAMPLES

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
2001 list				
ANDROSCOGGIN RIVER				
Gilead				
AGL-RBT-1	5/24/2001	290	230	1
AGL-RBT-2	5/24/2001	301	280	1
AGL-RBT-3	5/24/2001	273	190	1
AGL-RBT-4	5/24/2001	305	310	1
AGL-BNT-1	5/24/2001	274	260	1
Rumford Point				
ARP-SMB-1	9/11/2001	330	480	1
ARP-SMB-2	9/11/2001	342	600	1
ARP-SMB-3	9/11/2001	355	690	1
ARP-SMB-4	9/11/2001	352	700	1
ARP-SMB-5	9/11/2001	311	445	1
ARP-WHS-01D	9/11/2001	445	870	2C5
ARP-WHS-02D	9/11/2001	410	630	
ARP-WHS-03D	9/11/2001	422	750	
ARP-WHS-04D	9/11/2001	440	890	
ARP-WHS-05D	9/11/2001	441	770	
ARP-WHS-06D	9/11/2001	413	640	
ARP-WHS-07D	9/11/2001	434	770	
ARP-WHS-08D	9/11/2001	432	750	
ARP-WHS-09D	9/11/2001	434	780	
ARP-WHS-10D	9/11/2001	445	1016	
Rumford				
ARF-SMB-1	8/28/2001	320	430	1
ARF-SMB-2	8/28/2001	322	420	1
ARF-SMB-3	8/28/2001	345	550	1
ARF-SMB-4	8/28/2001	350	600	1
ARF-SMB-5	8/28/2001	355	625	1
ARF-SMB-6	8/28/2001	321	400	
ARF-SMB-7	8/28/2001	320	400	
ARF-SMB-8	8/28/2001	325	430	
ARF-SMB-9	8/28/2001	343	540	
ARF-SMB-10	8/28/2001	332	480	
ARF-WHS-1	8/28/2001	420	890	2C5
ARF-WHS-2	8/28/2001	419	880	
ARF-WHS-3	8/28/2001	446	1000	
ARF-WHS-4	8/28/2001	430	1040	
ARF-WHS-5	8/28/2001	412	740	
ARF-WHS-6	8/28/2001	445	930	
ARF-WHS-7	8/28/2001	400	700	
ARF-WHS-8	8/28/2001	410	820	
ARF-WHS-9	8/28/2001	421	910	
ARF-WHS-10	8/28/2001	403	680	

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
2001 list				
Riley				
ARY-SMB-1	9/18/2001	380	796	
ARY-SMB-2	9/18/2001	360	708	
ARY-SMB-3	9/19/2001	385	823.6	1
ARY-SMB-4	9/19/2001	372	678.1	1
ARY-SMB-5	9/20/2001	386	853.2	1
ARY-SMB-6	9/20/2001	370	879.3	1
ARY-SMB-7	9/20/2001	365	782.1	1
ARY-SMB-8	9/20/2001	410	948.8	
ARY-SMB-9	9/20/2001	350	579.1	1
ARY-SMB-10	9/20/2001	370	609.4	1
ARY-SMB-11	9/20/2001	371	649.7	1
ARY-SMB-12	9/20/2001	381	869.5	
ARY-SMB-13	9/20/2001	370	708.3	1
ARY-SMB-14	9/20/2001	375	763.3	1
small SMB				
ARY-SSMB-01	9/20/2001	125		1
ARY-SSMB-02	9/20/2001	163		1
ARY-SSMB-03	9/20/2001	115		1
ARY-SSMB-04	9/20/2001	117		1
ARY-SSMB-05	9/20/2001	155		1
ARY-SSMB-06	9/20/2001	130		1
ARY-SSMB-07	9/20/2001	122		1
ARY-SSMB-08	9/20/2001	125		1
ARY-SSMB-09	9/20/2001	118		1
ARY-SSMB-10	9/20/2001	115		1
ARY-WHS-19	9/18/2001	428	832.4	10C2
ARY-WHS-20	9/18/2001	423	883.4	
ARY-WHS-22	9/20/2001	426	1050.4	
ARY-WHS-29	9/20/2001	409	808.9	
ARY-WHS-30	9/20/2001	438	1043.5	
ARY-WHS-31	9/20/2001	410	812.8	
ARY-WHS-32	9/20/2001	402	927.8	
ARY-WHS-35	9/20/2001	442	1066.6	
ARY-WHS-50	10/23/01	430	1006	
ARY-WHS-51	10/23/01	440	982.8	
ARY-WHS-52	10/23/01	424	912.8	
ARY-WHS-53	10/23/01	440	1074	
ARY-WHS-54	10/23/01	435	963.3	
ARY-WHS-55	10/23/01	445	1069.9	
ARY-WHS-56	10/23/01	434	976.1	
ARY-WHS-57	10/23/01	458	983.1	
ARY-WHS-58	10/23/01	430	872.5	
ARY-WHS-59	10/23/01	430	922.8	
ARY-WHS-60	10/23/01	443	1019.5	
ARY-WHS-61	10/23/01	435	1020.1	

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
2001 list				
Livermore Falls Otis				
ALV-SMB-1	9/28/2001	360	548.3	1
ALV-SMB-2	9/28/2001	375	608.8	1
ALV-SMB-3	9/28/2001	371	673.2	1
ALV-SMB-4	9/28/2001	368	638.6	1
ALV-SMB-5	9/28/2001	382	721.4	1
ALV-SMB-6	9/28/2001	368	602.1	1
ALV-SMB-7	9/28/2001	382	772.3	1
ALV-SMB-8	9/28/2001	355	550.2	1
ALV-SMB-9	9/28/2001	366	577.4	1
ALV-SMB-10	9/28/2001	365	538.4	1
small SMB				
ALV-SSMB-11	10/3/2001	117		1
ALV-SSMB-12	10/3/2001	114		1
ALV-SSMB-13	10/3/2001	111		1
ALV-SSMB-14	10/3/2001	105		1
ALV-SSMB-15	10/3/2001	114		1
ALV-SSMB-16	10/3/2001	102		1
ALV-SSMB-17	10/3/2001	105		1
ALV-SSMB-18	10/3/2001	98		1
ALV-SSMB-19	10/3/2001	95		1
ALV-SSMB-20	10/3/2001	92		1
ALV-WHS-01	9/25/2001	416	625.6	10C2
ALV-WHS-02	9/25/2001	435	935.1	
ALV-WHS-03	9/25/2001	434	1027.8	
ALV-WHS-07	9/26/2001	435	886.1	
ALV-WHS-11	9/26/2001	438	968.8	
ALV-WHS-14	9/26/2001	435	1120	
ALV-WHS-16	9/26/2001	425	985.4	
ALV-WHS-18	9/26/2001	445	1098.3	
ALV-WHS-19	9/26/2001	440	1191.4	
ALV-WHS-20	9/27/2001	439	1234	
ALV-WHS-28	9/27/2001	425	997.8	
ALV-WHS-29	9/27/2001	439	1046.6	
ALV-WHS-30	9/27/2001	446	1074.1	
ALV-WHS-32	9/27/2001	418	953.3	
ALV-WHS-33	9/27/2001	422	902.7	
ALV-WHS-35	9/27/2001	415	1107.8	
ALV-WHS-36	9/27/2001	421	1034.4	
ALV-WHS-37	9/27/2001	448	1228.2	
ALV-WHS-41	9/27/2001	450	1089.9	
ALV-WHS-42	9/27/2001	407	831.6	

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
2001 list				
Androscoggin Lake				
ALW-SMB-1	10/18/2001	437	1070	2c5
ALW-SMB-2	10/19/2001	400	840	
ALW-SMB-3	2/7/2002	417	1080	
ALW-SMB-4	2/7/2002	421	1070	
ALW-SMB-5	2/7/2002	427	1190	
ALW-SMB-6	2/7/2002	467	1600	
ALW-SMB-7	2/7/2002	405	920	
ALW-SMB-8	2/7/2002	411	920	
ALW-SMB-9	2/7/2002	451	1220	
ALW-SMB-10	2/7/2002	472	1220	
ALW-WHP-1	10/12/2001	280	300	2c5
ALW-WHP-2	10/12/2001	297	313	
ALW-WHP-3	10/17/2001	352	550	
ALW-WHP-4	10/17/2001	298	360	
ALW-WHP-5	10/17/2001	302	355	
ALW-WHP-6	10/17/2001	276	300	
ALW-WHP-7	10/17/2001	284	300	
ALW-WHP-8	10/17/2001	282	280	
ALW-WHP-9	10/17/2001	257	215	
ALW-WHP-10	10/17/2001	266	240	
ALW-WHS-22 -**1**	10/12/2001	415	723.6	2c5
ALW-WHS-24-**2**	10/12/2001	395	661.1	
ALW-WHS-27-**3**	10/12/2001	398	594.3	
ALW-WHS-28-**4**	10/12/2001	425	801.7	
ALW-WHS-29-**5**	10/12/2001	405	690.9	
ALW-WHS-37-**6**	10/16/2001	455	760.2	
ALW-WHS-38-**7**	10/16/2001	455	765.2	
ALW-WHS-42-**8**	10/16/2001	430	765.1	
ALW-WHS-43-**9**	10/16/2001	475	953.3	
ALW-WHS-44-**10**	10/16/2001	445	925.9	
Auburn GIP				
AGI-SMB-1	10/4/2001	328	420	1
AGI-SMB-2	10/4/2001	410	970	1
AGI-SMB-3	10/4/2001	396	850	1
AGI-SMB-4	10/4/2001	390	720	1
AGI-SMB-5	10/4/2001	394	848	1
AGI-WHS-12-**1**	10/8/2001	380	503	2C5
AGI-WHS-13-**2**	10/8/2001	415	653.2	
AGI-WHS-14-**3**	10/8/2001	415	734.5	
AGI-WHS-15-**4**	10/8/2001	426	737.3	
AGI-WHS-16-**5**	10/8/2001	390	535.2	
AGI-WHS-18-**6**	10/8/2001	404	688.1	
AGI-WHS-22-**7**	10/9/2001	401	632.3	
AGI-WHS-24-**8**	10/9/2001	414	701.7	
AGI-WHS-25-**9**	10/9/2001	420	770	
AGI-WHS-34-**10**	10/10/2001	400	596.2	

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID 2001 list	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
Lisbon Falls				
ALS-SMB-1	8/20/2001	306	340	1
ALS-SMB-2	8/20/2001	334	450	1
ALS-SMB-3	8/20/2001	304	320	1
ALS-SMB-4	8/20/2001	305	330	1
ALS-SMB-5	8/20/2001	311	400	1
KENNEBEC RIVER				
Madison				
KMD-BNT-01	7/17/2001	378	570	1
KMD-BNT-02	7/17/2001	347	480	1
KMD-BNT-03	7/17/2001	375	580	1
KMD-BNT-04	7/17/2001	368	540	1
KMD-BNT-05	7/17/2001	373	540	1
Norridgewock				
KNW-SMB-1	10/15/2001	342	460	1
KNW-SMB-2	10/15/2001	350	600	1
KNW-SMB-5	10/16/2001	340	515	1
KNW-SMB-6	10/16/2001	320	400	1
KNW-SMB-7	10/16/2001	315	390	1
KNW-SMB-8	10/31/2001	305	400	1
KNW-SMB-9	10/31/2001	305	400	1
KNW-SMB-10	10/31/2001	300	345	1
KNW-SMB-11	10/31/2001	360	560	1
KNW-SMB-12	10/31/2001	340	600	1
KNW-SMB-13	10/31/2001	340	550	
KNW-WHS-1	10/15/2001	455	1085	1
KNW-WHS-2	10/16/2001	500	1360	
KNW-WHS-3	10/16/2001	465	1300	1
KNW-WHS-4	10/16/2001	450	1160	1
KNW-WHS-5	10/31/2001	470	1300	1
KNW-WHS-6	10/31/2001	450	1210	1
KNW-WHS-7	10/31/2001	465	1150	1
KNW-WHS-8	10/31/2001	465	1200	1
KNW-WHS-9	10/31/2001	480	1360	1
KNW-WHS-10	10/31/2001	470	1275	1
KNW-WHS-11	10/31/2001	485	1550	1
Fairfield				
KFF-BNT-01	8/2/2001	400	630	1
KFF-BNT-02	8/2/2001	382	600	1
KFF-BNT-03	8/2/2001	515	1220	1
KFF-BNT-04	10/30/2001	346	435	1
KFF-BNT-05	10/30/2001	495	1040	1

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID 2001 list	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
Fairfield				
KFF-SMB-1	10/30/2001	360	580	1
KFF-SMB-2	10/30/2001	336	505	1
KFF-SMB-3	10/30/2001	350	540	1
KFF-SMB-4	10/30/2001	350	560	1
KFF-SMB-5	10/30/2001	355	600	1
KFF-SMB-6	10/30/2001	330	470	1
KFF-SMB-7	10/30/2001	336	490	1
KFF-SMB-8	10/30/2001	326	410	1
KFF-SMB-9	10/30/2001	305	330	1
KFF-SMB-10	10/30/2001	300	300	1
KFF-WHS-01	10/30/2001	460	1250	1
KFF-WHS-02	10/30/2001	467	1430	1
KFF-WHS-03	10/30/2001	475	1410	1
KFF-WHS-04	10/30/2001	483	1570	1
KFF-WHS-05	10/30/2001	467	1530	1
KFF-WHS-06	10/30/2001	456	1200	1
KFF-WHS-07	10/30/2001	459	1280	1
KFF-WHS-08	10/30/2001	482	1550	1
KFF-WHS-09	10/30/2001	477	1440	1
KFF-WHS-10	10/30/2001	485	1570	1
Winslow				
KWL-BNT-01	7/16/2001	376	470	1
KWL-BNT-02	7/16/2001	335	325	1
KWL-BNT-03	7/18/2001	412	700	1
KWL-BNT-04	11/1/2001	295	220	1
KWL-BNT-05	11/1/2001	285	200	1
Sidney				
KSD-SMB-1	8/16/2001	325	450	1
KSD-SMB-2	8/16/2001	310	380	1
KSD-SMB-3	8/16/2001	320	420	1
KSD-SMB-4	8/16/2001	309	330	1
KSD-SMB-5	8/16/2001	310	360	1

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
2001 list				
PENOBSCOT RIVER				
Woodville				
PBW-SMB-01		367		1
PBW-SMB-02		357		1
PBW-SMB-03		365		1
PBW-SMB-04		370		1
PBW-SMB-08		370		1
PBW-SMB-11		380		1
PBW-SMB-12		360		1
PBW-SMB-13		357		1
PBW-SMB-14		365		1
PBW-SMB-15		380		1
PBW-WHS-03		460		1
PBW-WHS-04		469		1
PBW-WHS-07		470		1
PBW-WHS-14		455		1
PBW-WHS-15		464		1
PBW-WHS-18		458		1
PBW-WHS-19		469		1
PBW-WHS-24		475		1
PBW-WHS-27		469		1
PBW-WHS-28		462		1
Winn				
PBM-SMB1		392		1
PBM-SMB2		357		1
PBM-SMB3		363		1
PBM-SMB4		360		1
PBM-SMB5		375		1
PBM-SMB6		355		1
PBM-SMB7		374		1
PBM-SMB8		353		1
PBM-SMB9		372		1
PBM-SMB10		345		1
PBM-WHS-01		475		1
PBM-WHS-02		470		1
PBM-WHS-04		476		1
PBM-WHS-05		460		1
PBM-WHS-10		465		1
PBM-WHS-11		451		1
PBM-WHS-13		465		1
PBM-WHS-14		466		1
PBM-WHS-15		464		1
PBM-WHS-16		455		1

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID 2001 list	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
Lincoln				
PBL-SMB-01	8/28/2001	396	800	1
PBL-SMB-7	8/29/2001	395	875	1
PBL-SMB-8	8/29/2001	374	725	1
PBL-SMB-12	9/6/2001	376	809	1
PBL-SMB-13	9/7/2001	379	725	1
PBL-SMB-14	9/7/2001	384		1
PBL-SMB-15	9/11/2001	379	750	1
PBL-SMB-16	9/11/2001	386	775	1
PBL-SMB-18	9/12/2001	389	850	1
PBL-SMB-19	9/12/2001	375	755	1
PBL-WHS-3	9/6/2001	467	1020	1
PBL-WHS-10	9/11/2001	472	1175	1
PBL-WHS-12	9/11/2001	461	1100	1
PBL-WHS-13	9/12/2001	466	1220	1
PBL-WHS-14	9/13/2001	466	1325	1
PBL-WHS-15	9/13/2001	460	1050	1
PBL-WHS-20	9/13/2001	475		1
PBL-WHS-21	9/13/2001	459		1
PBL-WHS-22	9/13/2001	463		1
PBL-WHS-23	9/13/2001	460		1
Costigan				
PBC-SMB-2	8/22/2001	389	875	1
PBC-SMB-6	8/23/2001	377	800	1
PBC-SMB-7	8/23/2001	371	775	1
PBC-SMB-11	9/7/2001	394	900	1
PBC-SMB-19	9/7/2001	382	850	1
PBC-WHS-2	8/17/2001	430	920	2C5
PBC-WHS-5	8/20/2001	452	1050	
PBC-WHS-6	8/22/2001	410	825	
PBC-WHS-7	8/22/2001	430	875	
PBC-WHS-13	8/30/2001	416	975	
PBC-WHS-15	9/6/2001	466	1250	
PBC-WHS-17	9/6/2001	355	490	
PBC-WHS-21	9/11/2001	458	1200	
PBC-WHS-24	9/12/2001	452	1075	
PBC-WHS-25	9/12/2001	455	1075	
Veazie				
PBV-SMB-9	8/22/2001	371	575	1
PBV-SMB-12	8/22/2001	390	675	1
PBV-SMB-17	9/7/2001	388	825	1
PBV-SMB-18	9/7/2001	375	675	1
PBV-SMB-19	9/11/2001	378	675	1

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID 2001 list	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
Veazie				
PBV-WHS-01	6/9/2002	460		2C5
PBV-WHS-02		455		
PBV-WHS-03	6/11/2002	365		
PBV-WHS-04	6/12/2002	400		
PBV-WHS-05	6/15/2002	308		
PBV-WHS-06	6/18/2002	300		
PBV-WHS-07	6/20/2002	380		
PBV-WHS-08		320		
PBV-WHS-09		310		
PBV-WHS-10	29-Aug	395		
Orrington				
PBO-EEL-01	Aug-01	474	230	2C5
PBO-EEL-02	Aug-01	544	376	
PBO-EEL-03	Aug-01	491	278	
PBO-EEL-04	Aug-01	528	278	
PBO-EEL-05	Aug-01	540	335	
PBO-EEL-06	Aug-01	590	330	
PBO-EEL-07	Aug-01	576	353	
PBO-EEL-08	Aug-01	535	375	
PBO-EEL-09	Aug-01	590	430	
PBO-EEL-10	Aug-01	525	230	
PBO-EEL-11	Aug-01	570	353	
PRESUMPSCOT RIVER				
Windham				
PWD-SMB-1	7/27/2001	278	280	1
PWD-SMB-2	7/30/2001	284	290	1
PWD-SMB-3	7/30/2001	295	300	1
PWD-SMB-4	7/30/2001	310	365	1
PWD-SMB-5	7/30/2001	280	280	1
PWD-WHS-01	7/27/2001	440	1100	2C5
PWD-WHS-02	7/31/2001	470	1240	
PWD-WHS-03	7/31/2001	490	1180	
PWD-WHS-04	7/31/2001	485	1220	
PWD-WHS-05	7/31/2001	455	1020	
PWD-WHS-06	7/31/2001	440	900	
PWD-WHS-07	7/31/2001	445	960	
PWD-WHS-08	7/31/2001	456	1040	
PWD-WHS-09	7/31/2001	455	1160	
PWD-WHS-10	7/31/2001	435	860	
PWD-WHS-11	7/31/2001	434	910	

Appendix 7. Date sampled, lengths, weights, and number of samples for 2001 fish

FIELD ID 2001 list	DATE	LENGTH mm	WEIGHT gm.	SAMPLE N
Westbrook				
PWB-SMB-1	7/26/2001	290	330	1
PWB-SMB-2	7/26/2001	285	300	1
PWB-SMB-3	7/26/2001	295	320	1
PWB-SMB-4	7/26/2001	280	280	1
PWB-SMB-5	7/26/2001	270	270	1
PWB-WHS-01	7/27/2001	425	910	2C5
PWB-WHS-02	7/31/2001	415	780	
PWB-WHS-03	7/31/2001	405	780	
PWB-WHS-04	7/31/2001	430	950	
PWB-WHS-05	7/31/2001	455	1060	
PWB-WHS-06	7/31/2001	435	940	
PWB-WHS-07	8/1/2001	455	1020	
PWB-WHS-08	8/2/2001	435	1000	
PWB-WHS-09	8/2/2001	420	740	
PWB-WHS-10	8/2/2001	390	700	
PWB-WHS-11	8/2/2001	460	1100	
SALMON FALLS RIVER				
S. Berwick				
SFS-SMB-1	10/24/2001	334		1
SFS-SMB-2	10/24/2001	385		1
SFS-SMB-3	10/24/2001	264		1
SFS-SMB-4	10/24/2001	255		1
SEBASTICOOK R West Br.-Palmyra				
SWP-SMB-1	8/15/2001	363	680	1
SWP-SMB-2	8/15/2001	294	300	1
SWP-SMB-3	8/15/2001	305	380	1
SWP-SMB-4	8/16/2001	395	860	1
SWP-SMB-5	8/16/2001	300	340	1
SEBASTICOOK R East Br.-Newport				
SEN-SMB-01	8/9/2001	436	1120	1
SEN-SMB-02	8/9/2001	334	510	1
SEN-SMB-03	8/9/2001	342	490	1
SEN-SMB-04	8/9/2001	308	380	1
SEN-SMB-05	8/9/2001	306	390	1
SEBASTICOOK R East Br.-Detroit				
SED-SMB-01	8/8/2001	340	600	1
SED-SMB-02	8/8/2001	319	390	1
SED-SMB-03	8/8/2001	380	745	1
SED-SMB-04	8/8/2001	343	600	1
SED-SMB-05	8/8/2001	270	320	
SED-SMB-06	8/8/2001	310	400	1

APPENDIX 8

SAMPLING SCHEDULE FOR THE 2001 DIOXIN MONITORING PROGRAM

Sampling schedule for the Dioxin Monitoring Program

May (early stations)

Androscoggin R at Lisbon Falls for brown trout
Kennebec R above Madison for brown trout
Kennebec R at Augusta for brown trout
Kennebec R at Fairfield for brown trout
E Br Sebasticook R at County Rd, Newport for bass/wh perch
W Br Sebasticook R at Rt 2 Palmyra for bass

JULY-AUGUST (all rivers in order, beginning at upstream stations)

Androscoggin R - July
Kennebec R - July
Penobscot R - August
Presumpscot R - August
Salmon Falls R - August
Sebasticook R (East and West Branches) - August

APPENDIX 9

TOXIC EQUIVALENCY FACTORS FOR PCDDS AND PCDFS

Appendix 9. Toxicity Equivalency Factors for PCDDs AND PCDFs (Van den Berg et al, 1998)

Congener	**Toxic Equivalency Factor (TEF)**		
	Humans/ Mammals	**Fish**	**Birds**
Dioxins			
2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PeCDD	1	1	1
1,2,3,4,7,8-HxCDD	0.1	0.5	0.05
1,2,3,6,7,8-HxCDD	0.1	0.01	0.01
1,2,3,7,8,9-HxCDD	0.1	0.01	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.001	<0.001
OCDD	0.0001	<0.0001	0.0001
Furans			
2,3,7,8-TCDF	0.1	0.05	1
1,2,3,7,8-PeCDF	0.05	0.05	0.1
2,3,4,7,8-PeCDF	0.5	0.5	1
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.01
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.01
OCDF	0.0001	<0.0001	0.0001
PCBs			
3,4,4',5-TCB (81)	0.0001	0.0005	0.1
3,3',4,4'-TCB (77)	0.0001	0.0001	0.05
3,3',4,4',5-PeCB (126)	0.1	0.005	0.1
3,3',4,4',5,5'-HxCB (169)	0.01	0.00005	0.001
2,3,3',4,4'-PeCB (105)	0.0001	<0.000005	0.0001
2,3,4,4',5-PeCB (114)	0.0005	<0.000005	0.0001
2,3',4,4',5-PeCB (118)	0.0001	<0.000005	0.00001
2',3,4,4',5-PeCB (123)	0.0001	<0.000005	0.00001
2,3,3',4,4',5-HxCB (156)	0.0005	<0.000005	0.0001
2,3,3',4,4',5'-HxCB (157)	0.0005	<0.000005	0.0001
2,3',4,4',5,5'-HxCB (167)	0.00001	<0.000005	0.00001
2,3,3',4,4',5,5'-HpCB (189)	0.0001	<0.000005	0.00001

APPENDIX 10

DIOXIN AND FURAN IN FISH AND SHELLFISH 1984-1996

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	NDS/NBS 1984-86 TCDD	MAINE 1988-1990 TCDD	MAINE 1988-1990 DTE	1991 TCDD	1991 DTE	1992 TCDD	1992 DTE
ANDROSCOGGIN LAKE									
Wayne	bn trout	f							
	bass	f							
	w perch								
	sucker	w							
ANDROSCOGGIN R									
Gilead	rb trout								
	bn trout								
	bass								
	sucker	w	1.8f/6.5w						
Rumford	bass	f				1.4	2.3-2.8	0.6	1.0-1.2
	sucker	w						3.0	7.4-8.0
Riley	bass								
	sucker	w	<2.1f/13w						
Jay	bass	f		17.6	24.0-29.1			1.2	1.9-2.3
	sucker	w						5.4	12.9-13.9
Livermore Falls	bass	f				2.4	3.1-3.3	1.1	1.4-1.5
	sucker	w						3.8	7.4-8.0
N Turner	sucker	w	6.2f/30w						
Auburn-GIP	bass	f	3.7f/24w					1.7	2.6-2.8
	lm bass	f						1.1	1.6-1.8
	sucker	w	8.3f/29w					5.6	14.3-15.4
	bullhead	w	7.8f/29.6w						
Lisbon Falls	bn trout	f		5.3	6.5-6.9				
	bass	f		4.5	5.5-5.8			0.7	1.0
	sucker	w	5.1f/12w					3.4	8.1-8.7
Brunswick	sucker	w	19.0						
	carp	f	11.0						
BEARCE LAKE									
Baring	pickerel	f	<0.1						
BRAVE BOAT HARBOR									
Kittery	lobster	m							
	lobster	t							
BROOKLYN	lobster	m							
	lobster	t							
COREA	lobster	t							
JONES CREEK									
Scarborough	clam	m						<0.1	0.02-0.3

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	NDS/NBS 1984-86 TCDD	MAINE 1988-1990 TCDD	MAINE 1988-1990 DTE	1991 TCDD	1991 DTE	1992 TCDD	1992 DTE
KENNEBEC R									
Madison	bn trout	f							
	bass	f						<0.1	0.02-0.1
	sucker	w						0.1	0.3
Norridgewock	bass								
	bn trout								
	sucker								
Fairfield	trout	f		6.2	6.9-8.0			1.4	1.6-1.8
	bass	f				1.4	1.6-1.7	0.6	0.6-0.7
	sucker	w	6.4	10.3	16.8-18.1			2.0	3.1-3.3
Sidney	bass	f	20.3w			1.0	1.4-2.4	0.4	0.6-1.0
	bn trout								
	sucker	w	1.2f/11.4w					2.7	4.4-4.8
Augusta	bn trout	f		2.2	2.9-4.9			1.9	2.5-4.3
	bass	f						0.4	0.6-1.0
	sucker	w		5.0	7.3-8.4			1.5	2.6-2.8
Hallowell	smelt	c						0.2	0.5-0.8
Richmond	eel	f							
Phippsburg	clam	m						0.3	0.6-0.9
	lobster	m							
	lobster	t							
MESSALONSKEE LAKE									
Belgrade	bass					<0.09	0.04-0.3		
NARRAGUAGUS R									
Cherryfield	fallfish	w	<1.0						
NORTH POND									
Chesterfield	sucker	w	0.4						
	pickerel	f	<0.1						
PENOBSCOT R									
E Br Grindstone	bass	f		<0.1	0.09-0.2				
	sucker	w		<0.4	0.02-0.6				
E Millinocket	bass	f		<0.2	0.4-0.8				
	sucker	w		0.7	3.6-4.2				
Woodville	bass								
	sucker								
Winn	bass								
	sucker								
N Lincoln	bass	f		<0.4	0.2-0.8				
	sucker	w		<0.5-20.8	2.0-41.6				
S Lincoln	bass	f	5.0	1.7	2.3-2.7	0.9	1.2-1.3	0.7	1.0-1.2
	sucker	w		37.0	66.4-67.2			3.3	6.8
Passadumkeag	bass	f		1.8	2.9				
	sucker	w		2.8	7.6-7.7				
Milford	bass	f		0.9	1.4-1.7			0.3	0.4-0.5
	sucker	w		9.7	19.9-20.1			2.2	4.6
Veazie	bass	f	4.6w	1.9	2.4-2.6	1.2	1.5-1.7	0.4	0.6
	sucker	w	2.6f/7.6w	5.9	9.8-9.9	2.5	4.9-5.0	2.2	4.8-4.9

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS 1984-86	MAINE 1988-1990		1991		1992	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
PENOBSCOT R									
Bangor	eel	f							
Bucksport	clam	m						0.1	0.8-0.9
Stockton Springs	lobster	m							
	lobster	t							
OWLS HEAD	mussel	m	<0.8						
PISCATAQUIS R									
Sangerville	bass	f				<0.2	0.03-0.3		
	bn trout	f				<0.4	0.03-0.4		
	sucker	w				0.26	0.6-0.7		
Howland	bass	f		<0.2	0.02-0.6				
PRESUMPSCOT R									
Windham	bass	f							
	sucker	w							
Westbrook	bass	f		1.8	2.4-4.5	0.2	0.2-0.4	0.1	0.2-0.4
	pickerel	f		<2.6	0.06-5.9				
	w perch	f		1.2	2.5-3.1	0.4	0.9-1.0		
	sucker	w	5.2	5.1	8.2-9.6	0.6	1.6-1.7	0.3	0.8-0.9
Falmouth	clam	m						<0.1	0.2-0.4
Portland	lobster	m							
	lobster	t							
ST CROIX R									
Woodland	bass	f							
	sucker								
Baring	bass			0.3	0.5-1.0	<0.1	0.04-0.3		
	sucker	w	<0.7	0.6	1.0-1.1				
Robbinston	lobster	t							
ST JOHN R									
Frenchville	sucker	w							
Madawaska	y perch	f		<0.5	0.08-0.8				
	bk trout	f							
	sucker	w							
SACO R									
Dayton	sucker	w	<0.3						
SACO BAY									
Scarborough	lobster	m							
	lobster	t							
SALMON FALLS R									
Acton	lm bass								
	sucker								
S Berwick	bass	f		0.4	0.5-0.6				
	lm bass								
	pickerel	f		0.2	0.3				
	sucker	w		1.5	2.1-2.2			2.4	3.4-3.6

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			NDS/NBS 1984-86	MAINE 1988-1990		1991		1992	
WATER/STATION	SPECIES	TISSUE	TCDD	TCDD	DTE	TCDD	DTE	TCDD	DTE
SANDY P									
	bass	f	<1.0						
SEBAGO L									
Naples	bass	w	<0.6						
SEBASTICOOK R									
E Br Corinna	lm bass								
	bass								
	sucker								
Newport	bass	f						0.1	0.3-0.4
	lm bass	f	<0.2					<0.2	0.2-0.4
	w perch	f		1.0	1.6-2.1				
Sebastcook L	bass	f							
	w perch	f							
Detroit	bass	f							
W Br Harmony	bass								
	sucker								
W Br Palmyra	bass	f		1.2	1.4-1.8			0.4	0.5-0.6
	pickerel	f	<0.1					0.2	0.2
	sucker	w	1.6	3.3	4.3-4.6			1.1	1.4-1.6
WEBBER POND									
Vassalboro	bass	f				<0.08	0.04-0.4		

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents using WHO 98 toxic equivalency factors (TEF).
Range shown at nd=0 and nd=mdl, ie DTEo-DTEd

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

WATER/STATION	SPECIES	TISSUE	1993 TCDD	1993 DTE	1994 TCDD	1994 DTE	1995 TCDD	1995 DTE	1996 TCDD	1996 DTE
ANDROSCOGGIN LAKE										
Wayne	bn trout	f							0.7	1.1-2.3
	bass	f							0.6	1.2-2.2
	w perch									
	sucker	w							0.4	1.4-2.5
ANDROSCOGGIN R										
Gilead	rb trout						1.2	2.4-2.9	0.9	2.0-2.6
	bn trout								0.4	1.0-1.5
	bass						0.9	3.8-4.1		
	sucker	w					1.7	6.1-6.7	0.7	4.4-5.3
Rumford	bass	f	2.9	4.5-5.4	3.8	5.7-6.2	2.2	3.5-4.1		
	sucker	w	5.8	13.6-14.6	4.0	11.4-11.9			0.8	4.1-5.2
Riley	bass									
	sucker	w								
Jay	bass	f	1.4	1.8-2.2	1.6	2.2-2.8			0.5	1.3-1.4
	sucker	w	4.5	10.9-11.8	4.7	11.5-12.3	2.3	6.9-7.6		
Livermore Falls	bass	f	1.4	1.6-1.8	1.4	1.6-2.3	0.5	0.8-1.3		
	sucker	w	3.6	6.8-7.3	2.2	4.8-5.3			0.6	3.4-3.9
N Turner	sucker	w								
Auburn-GIP	bass	f	1.2	1.8-1.9	1.3	2.0-2.7			0.6	2.1-2.5
	lm bass	f								
	sucker	w	3.7	9.0-9.8	1.6	4.4-5.4	1.4	3.8-5.0		
	bullhead	w	2.1	3.0-3.3	1.3	2.3-2.8				
Lisbon Falls	bn trout	f								
	bass	f	1.2	1.7-1.8	0.6	0.8-1.7	0.9	1.4-2.4		
	sucker	w	2.7	6.1-6.6	2.4	5.8-6.2			0.7	1.6-2.8
Brunswick	sucker	w								
	carp	f								
BEARCE LAKE										
Baring	pickerel	f								
BRAVE BOAT HARBOR										
Kittery	lobster	m			<0.1	<0.1-1.2			1.7	13.8-15.5
	lobster	t			1.3	9.7-11.5	1.6	6.7-9.9		
BROOKLYN	lobster	m					0.8	4.9-8.2		
	lobster	t								
COREA	lobster	t							0.6	6.6-7.3
JONES CREEK										
Scarborough	clam	m								

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1993		1994		1995		1996	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
KENNEBEC R										
Madison	bn trout	f					<0.1	0.1-0.7		
	bass	f							<0.1	0.1-0.8
	sucker	w					0.1	0.3-1.0	<0.1	0.3-1.0
Norridgewock	bass									
	bn trout									
	sucker									
Fairfield	trout	f	1.4	1.6-1.9	2.2	2.5-3.8	1.6	1.7-2.5		
	bass	f	1.5	1.7-2.0	0.9	1.1-1.8				
	sucker	w	1.6	2.2-2.6	2.2	2.9-3.8			1.6	2.1-2.7
Sidney	bass	f	0.6	0.8-1.4	0.3	0.4-1.3			0.2	0.4-1.0
	bn trout									
	sucker	w	1.5	2.5-2.7	2.3	3.0-4.0	1.2	1.7-2.5		
Augusta	bn trout	f					1.0	1.3-3.5		
	bass	f	0.6	0.9-1.5	1.0	1.3-3.7				
	sucker	w	1.9	3.3-3.6	2.3	4.0-5.8			2.2	2.6-3.3
Hallowell	smelt	c								
Richmond	eel	f	0.6	0.8-1.4						
Phippsburg	clam	m							3.6	16.7-18.6
	lobster	m	0.2	0.3-1.2	<0.1	<0.1-1.6				
	lobster	t	7.9	27.5-27.6	6.5	23.4-26.6	4.6	13.5-17.1		
MESSALONSKEE LAKE										
Belgrade	bass									
NARRAGUAGUS R										
Cherryfield	fallfish	w								
NORTH POND										
Chesterfield	sucker	w								
	pickerel	f								
PENOBSCOT R										
E Br Grindstone	bass	f					<0.1	0.1-0.7	<0.1	0.1-0.8
	sucker	w					<0.1	0.1-0.6	<0.1	0.1-0.8
E Millinocket	bass	f								
	sucker	w								
Woodville	bass									
	sucker									
Winn	bass									
	sucker									
N Lincoln	bass	f								
	sucker	w								
S Lincoln	bass	f	1.2	1.6-1.8	0.4	0.4-1.7	0.5	0.7-1.3	0.3	0.5-1.2
	sucker	w	1.7	3.5-3.6	2.2	5.8-6.1			1.6	2.2-3.2
Passadumkeag	bass	f								
	sucker	w								
Milford	bass	f								
	sucker	w								
Veazie	bass	f	0.6	0.8-1.0	0.2	0.2-1.3	0.3	0.4-1.9	0.3	0.3-1.5
	sucker	w	1.1	2.7-3.0	0.6	1.6-2.8	0.5	1.4-2.5	0.4	0.9-2.0

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1993		1994		1995		1996	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
PENOBSCOT R										
Bangor	eel	f	1.0	1.1-1.2					0.3	0.4-1.5
Bucksport	clam	m								
Stockton Springs	lobster	m	0.1	0.3-1.1	<0.1	0.1-1.0			0.9	12.5-13.2
	lobster	t	4.0	28.0	2.3	18.1-27.9	1.3	7.2-14.6		
OWLS HEAD	mussel	m								
PISCATAQUIS R										
Sangerville	bass	f								
	bn trout	f								
	sucker	w								
Howland	bass	f								
PRESUMPSCOT R										
Windham	bass	f	<0.1	<0.1-0.3	<0.1	<0.1-1.1			<0.1	0.5-1.5
	sucker	w	0.3	0.7-0.8	0.2	1.4-2.4	0.3	2.4-7.7		
Westbrook	bass	f	<0.2	0.1-0.5	0.2	0.3-1.2			0.2	0.4-0.9
	pickerel	f								
	w perch	f								
	sucker	w	1.1	1.8-2.3	0.9	2.1-3.7	0.8	1.6-2.6		
Falmouth	clam	m								
Portland	lobster	m	<0.1	0.1-0.8	<0.1	0.2-1.0			2.7	18.9-21.6
	lobster	t	3.4	18.5-18.7	2.5	17.2-21.3	2.2	9.5-12.8		
ST CROIX R										
Woodland	bass	f								
	sucker									
Baring	bass									
	sucker	w								
Robbinston	lobster	t							1.0	10.2-11.2
ST JOHN R										
Frenchville	sucker	w			0.1	0.2-1.0				
Madawaska	y perch	f								
	bk trout	f			<0.3	<0.1-2.3				
	sucker	w			<0.1	0.2-0.8				
SACO R										
Dayton	sucker	w								
SACO BAY										
Scarborough	lobster	m	<0.1	0.1-0.8	<0.1	<0.1-0.8				
	lobster	t	2.0	11.3-14.6	1.3	9.7-12.0				
SALMON FALLS R										
Acton	lm bass						<0.1	<0.1-0.7	<0.1	0.1-1.0
	sucker									
S Berwick	bass	f	0.2	0.2-0.9	0.5	0.7-3.3	0.4	0.4-4.0		
	lm bass									
	pickerel	f								
	sucker	w	1.9	3.6-3.8	2.1	4.7-6.1			2.0	3.2-4.5

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			19 93		19 94		19 95		19 96	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
SANDY P										
	bass	f								
SEBAGO L										
Naples	bass	w								
SEBASTICOOK R										
E Br Corinna	lm bass						0.1	0.2-1.1		
	bass									
	sucker									
Newport	bass	f								
	lm bass	f					0.3	1.1-2.0		
	w perch	f							0.3	1.6-2.3
Sebastcook L	bass	f								
	w perch	f								
Detroit	bass	f								
W Br Harmony	bass						<0.1	0.1-0.8		
	sucker								0.1	0.1-1.2
W Br Palmyra	bass	f	0.9	1.2-1.6	0.4	0.4-1.3	0.8	1.7-2.2		
	pickerel	f								
	sucker	w	1.0	2.6-2.7	1.2	4.0-4.3			1.2	2.2-3.6
WEBBER POND										
Vassalboro	bass	f								

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents using
Range shown at nd=0 and nd=mdl, ie D

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1997		1998		1999		2000		2001	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
ANDROSCOGGIN LAKE												
Wayne	bn trout	f										
	bass	f			0.2	0.4-1.0	0.1	0.2-0.8	<0.1	0.02-1.3	<0.1	0.1-0.8
	w perch				0.5	0.6-1.2	0.2	0.3-0.9	0.2	0.2-0.8	0.1	0.2-0.7
	sucker	w			0.4	0.9-1.1			<0.1	0.1-1.1	<0.1	0.1-0.7
ANDROSCOGGIN R												
Gilead	rb trout		0.5	1.6-2.1	0.4	1.5-2.0	0.7	1.7-2.3	0.4	0.9-1.4	0.8	2.1-2.5
	bn trout						0.4	1.0-1.5	0.1	0.4-1.0	0.8	2.5-2.7
	bass						0.4	1.4-1.5	0.2	0.8-1.2	0.3	1.0-1.4
	sucker	w	0.5	3.4-3.8	0.9	3.1-3.5	0.8	2.9-3.3	0.3	1.8-2.2	0.1	0.7-1.1
Rumford	bass	f	0.5	1.2-1.8	0.4	1.1-1.5	0.6	1.5-1.9	0.2	0.6-1.1	0.2	0.5-1.0
	sucker	w	0.5	3.6-4.9	0.4	3.0-3.4	0.4	2.8-3.2	0.3	1.9-2.3	0.3	2.0-2.4
Riley	bass		0.3	1.1-2.2	0.2	0.8-1.0	<0.1	0.6-0.9	<0.1	0.2-0.6	0.2	0.8-1.0
	sucker	w	0.5	3.8-4.8	0.3	2.5-2.8	0.3	2.6-2.8			0.3	1.9-2.1
Jay	bass	f										
	sucker	w										
Livermore Falls	bass	f	0.3	1.2-1.4	0.2	1.1-1.2	0.2	0.9-1.2	0.2	0.6-1.0	0.3	0.9-1.4
	sucker	w	0.5	2.8-2.9	0.5	2.8-2.9	0.4	2.4			0.3	1.6-1.7
N Turner	sucker	w										
Auburn-GIP	bass	f	0.4	2.0-2.2	0.4	1.6-1.8	0.4	1.6-1.8	0.1	0.4-0.9	0.2	0.4-0.9
	lm bass	f										
	sucker	w									0.2	0.6-0.9
	bullhead	w										
Lisbon Falls	bn trout	f										
	bass	f	0.6	1.3-1.8	0.5	1.1-1.5	0.7	1.7-2.1	0.2	0.5-1.0	0.4	0.9-1.3
	sucker	w										
Brunswick	sucker	w										
	carp	f										
BEARCE LAKE												
Baring	pickerel	f										
BRAVE BOAT HARBOR												
Kittery	lobster	m										
	lobster	t										
BROOKLYN	lobster	m										
	lobster	t										
COREA	lobster	t										
JONES CREEK												
Scarborough	clam	m										

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1997		1998		1999		2000		2001	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
KENNEBEC R												
Madison	bn trout	f									<0.1	<0.1-0.7
	bass	f	<0.2	0.03-1.6								
	sucker	w	<0.1	0.2-0.8								
Norridgewock	bass				<0.1	0.03-0.6	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	0.1-0.8
	bn trout								<0.1	0.04-0.7		
	sucker				<0.1	0.2-0.7	<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	<0.1-0.7
Fairfield	trout	f	1.2	1.3-1.9							1.0	1.2-1.8
	bass	f	0.6	0.6-1.2	0.3	0.4-1.0	0.4	0.4-1.0	0.4	0.5-1.1	0.2	0.4-0.9
	sucker	w	1.2	1.7-2.1	0.9	1.4-1.8	0.3	0.4-1.0	0.4	0.5-1.0	0.3	0.5-1.1
Sidney	bass	f	0.2	0.3-0.9					0.2	0.2-0.8	0.2	0.4-0.9
	bn trout								0.3	0.3-0.8	0.4	0.5-1.1
	sucker	w										
Augusta	bn trout	f	0.6	1.0-1.3								
	bass	f	0.5	0.8-1.6	0.3	0.6-0.9	0.3	0.6-0.9				
	sucker	w										
Hallowell	smelt	c										
Richmond	eel	f										
Phippsburg	clam	m										
	lobster	m										
	lobster	t										
MESSALONSKEE LAKE												
Belgrade	bass											
NARRAGUAGUS R												
Cherryfield	fallfish	w										
NORTH POND												
Chesterfield	sucker	w										
	pickerel	f										
PENOBSCOT R												
E Br Grindstone	bass	f	<0.1	0.04-0.7	<0.1	0.04-0.7						
	sucker	w	<0.1	0.07-0.7	<0.1	0.07-0.7						
E Millinocket	bass	f	<0.1	0.04-0.7	<0.1	0.04-0.7						
	sucker	w	<0.1	0.09-0.7	<0.1	0.09-0.7						
Woodville	bass		<0.1	0.07-0.7	<0.1	0.06-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7
	sucker		<0.1	0.09-0.7	<0.1	0.08-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7	<0.1	0.1-0.7
Winn	bass						<0.1	0.2-0.8	<0.1	0.1-0.7	<0.1	<0.1-0.7
	sucker						<0.1	0.2-0.9	<0.1	0.1-0.8	<0.1	<0.1-0.7
N Lincoln	bass	f										
	sucker	w										
S Lincoln	bass	f	0.2	0.4-1.0	0.2	0.4-0.9	0.4	0.6-1.0	0.2	0.3-0.9	0.4	0.5-1.1
	sucker	w	1.2	1.6-2.2	1.0	1.4-2.0	1.0	1.4-1.6	0.7	1.0-1.5	0.3	0.5-1.1
Passadumkeag	bass	f										
	sucker	w										
Milford	bass	f	0.2	0.4-0.9	0.2	0.2-0.8	0.1	0.4-0.7	0.2	0.3-0.9	0.3	0.5-1.1
	sucker	w	1.0	1.6-2.0	1.0	1.5-2.0	1.0	1.5-1.6	0.8	1.1-1.6	0.4	0.5-1.0
Veazie	bass	f	0.3	0.4-0.9	0.2	0.3-0.9	0.3	0.4-0.9	0.4	0.5-1.1	0.2	0.3-0.8
	sucker	w	1.1	1.3-1.9	1.0	1.2-1.8	1.1	1.3-1.7	0.9	1.2-1.7	1.3	1.7-2.2

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			19 97		19 98		19 99		20 00		20 01	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
PENOBSCOT R												
Bangor	eel	f							1.6	2.0-2.5	1.1	1.5-2.0
Bucksport	clam	m										
Stockton Springs	lobster	m										
	lobster	t										
OWLS HEAD	mussel	m										
PISCATAQUIS R												
Sangerville	bass	f										
	bn trout	f										
	sucker	w										
Howland	bass	f										
PRESUMPSCOT R												
Windham	bass	f	<0.1	0.5-0.7	<0.1	0.4-0.8			<0.1	0.1-0.7	<0.1	0.1-0.7
	sucker	w	0.2	1.2-1.4	0.2	1.2-1.4					0.2	1.4-1.5
Westbrook	bass	f	0.1	0.4-0.9	<0.1	0.3-0.8			<0.1	0.2-0.8	<0.1	<0.1-0.7
	pickerel	f	0.2	1.6-2.0	0.2	1.6-2.0					0.2	1.3-1.7
	w perch	f										
	sucker	w										
Falmouth	clam	m										
Portland	lobster	m										
	lobster	t										
ST CROIX R												
Woodland	bass	f	<0.1	0.02-0.7	<0.1	0.06-0.7	<0.1	0.06-0.7				
	sucker		<0.1	0.09-0.7	<0.1	0.08-0.7	<0.1	0.07-0.7				
Baring	bass		<0.1	0.03-0.7	<0.1	0.05-0.7	<0.1	0.05-0.7				
	sucker	w	<0.1	0.07-0.8	<0.1	0.08-0.8	<0.1	0.08-0.7				
Robbinston	lobster	t										
ST JOHN R												
Frenchville	sucker	w										
Madawaska	y perch	f										
	bk trout	f										
	sucker	w										
SACO R												
Dayton	sucker	w										
SACO BAY												
Scarborough	lobster	m										
	lobster	t										
SALMON FALLS R												
Acton	lm bass											
	sucker											
S Berwick	bass	f	0.2	0.3-0.6			0.1	0.3-0.6	0.1	0.2-0.8	0.2	0.4-0.8
	lm bass						0.2	0.5-0.8				
	pickerel	f	0.6	0.8-1.0								
	sucker	w										

APPENDIX 10. DIOXIN AND FURAN CONCENTRATIONS IN MAINE FISH AND SHELLFISH 1984-1995 (pg/g)

			1997		1998		1999		2000		2001	
WATER/STATION	SPECIES	TISSUE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE	TCDD	DTE
SANDY P												
	bass	f										
SEBAGO L												
Naples	bass	w										
SEBASTICOOK R												
E Br Corinna	lm bass		<0.1	0.1-0.7								
	bass											
	sucker											
Newport	bass	f	0.2	1.2-1.4							0.1	0.6-0.9
	lm bass	f										
	w perch	f										
Sebastcook L	bass	f							0.1	0.5-0.8		
	w perch	f							0.2	0.8-0.9		
Detroit	bass	f									0.1	0.2-0.8
W Br Harmony	bass		<0.1	0.06-0.7								
	sucker											
W Br Palmyra	bass	f	0.3	0.6-0.9	0.2	0.5-0.8	0.2	0.6-0.8	0.1	0.4-2.7	0.2	0.5-0.8
	pickerel	f										
	sucker	w										
WEBBER POND												
Vassalboro	bass	f										

f=fillet
m=meat
t=tomalley
w=whole

DTE= dioxin toxic equivalents using
Range shown at nd=0 and nd=mdl, ie D

APPENDIX 11

SPMD DATA

Rumford Upstream Data July 2001 N=20 2 SPMDs per sample <DL=0

Congener	MDL*	SPMD 21	SPMD 22	SPMD 23	SPMD 24	SPMD 25	SPMD 26
						Average Temperature 19.34	
2,3,7,8-TCDF	0.8		11.815	7.814	11.072	8.941	
1,2,3,7,8-PeCDF	2.08		0.626	0.838	1.363	0.612	
2,3,4,7,8-PeCDF	3.13		1.069	1.229	1.148	1.036	
1,2,3,4,7,8-HxCDF	2.59		1.228	0.990	0.934	1.064	
1,2,3,6,7,8-HxCDF	2.46		0.340	0.306	0.557	0.427	
2,3,4,6,7,8-HxCDF	2.88		0.201	0.386	0.342	0.286	
1,2,3,7,8,9-HxCDF	1.68		0.130	0.183	0.135	0.221	
1,2,3,4,6,7,8-HpCDF	2.65		0.390	1.173	0.164	2.896	
1,2,3,4,7,8,9-HpCDF	1.56		0.000	0.108	0.000	0.200	
OCDF	7.18		0.000	0.401	0.000	0.704	
2,3,7,8-TCDD	2.1		0.219	0.243	0.198	0.222	
1,2,3,7,8-PeCDD	2.14		0.166	0.000	0.163	0.088	
1,2,3,4,7,8-HxCDD	3.08		0.195	0.277	0.288	0.287	
1,2,3,6,7,8-HxCDD	1.22		0.611	0.573	0.930	0.506	
1,2,3,7,8,9,-HxCDD	2.84		0.000	0.247	0.355	0.362	
1,2,3,4,6,7,8-HpCDD	2.31		1.077	0.825	0.757	0.876	
OCDD	6.7		3.938	2.056	5.764	3.944	
TEQ			2.418	1.998	2.474	2.108	

			DOC 7/17	TOC 7/17	Sp. Cond.	Flow 7/13	
			4.5042	4.5066	55.57	1.8	
Congener	MDL*	SPMD 27	SPMD 28	SPMD 29	SPMD 30	SPMD 31	SPMD 32
2,3,7,8-TCDF	0.8			0.000		11.079	10.818
1,2,3,7,8-PeCDF	2.08			1.741		1.159	0.793
2,3,4,7,8-PeCDF	3.13			1.539		1.381	0.764
1,2,3,4,7,8-HxCDF	2.59			1.077		0.987	0.964
1,2,3,6,7,8-HxCDF	2.46			0.430		0.287	0.277
2,3,4,6,7,8-HxCDF	2.88			0.308		0.240	0.168
1,2,3,7,8,9-HxCDF	1.68			0.046		0.124	0.060
1,2,3,4,6,7,8-HpCDF	2.65			3.051		1.377	1.770
1,2,3,4,7,8,9-HpCDF	1.56			0.000		0.127	0.126
OCDF	7.18			0.000		0.000	0.000
2,3,7,8-TCDD	2.1			0.344		0.263	0.305
1,2,3,7,8-PeCDD	2.14			0.077		0.029	0.016
1,2,3,4,7,8-HxCDD	3.08			0.000		0.216	0.029
1,2,3,6,7,8-HxCDD	1.22			0.190		0.367	0.204
1,2,3,7,8,9,-HxCDD	2.84			0.048		0.270	0.136
1,2,3,4,6,7,8-HpCDD	2.31			0.000		0.694	0.535
OCDD	6.7			2.291		2.135	2.472
TEQ		0	0	1.518		2.420	2.033

M/z ion ratio data flags, DPE,co-elution etc.
Surrogate recovery data flags
Both M/z ratio and Surrogate Recovery data flags
* MDL from Heather's work
\# Major problems with pentachlorinated dioxin/furans

DOC 8/10	TOC 8/10	Sp. Cond.	Flow 8/10
4.6	4.5	61.8	0.5

SPMD 33	SPMD 34	SPMD 35	SPMD 36	SPMD 37	SPMD 38
				12.816	13.735
				0.153	1.205
				0.440	1.621
				1.004	1.155
				0.279	0.236
				0.261	0.158
				0.096	0.026
				1.480	1.853
				0.208	0.898
				0.283	0.223
				0.241	0.241
				0.000	0.009
				0.110	0.051
				0.488	0.486
				0.134	0.066
				0.881	0.842
				3.309	2.501
	0	0	0	2.013	2.749

SPMD 39	SPMD 40	Mean	Std. Dev.	%RSD
12.083	1.623	9.254	4.500	48.621
2.765	0.176	1.039	0.748	72.002
2.789	0.351	1.215	0.662	54.474
2.163	0.445	1.092	0.407	37.313
1.316	0.314	0.434	0.307	70.795
1.126	0.254	0.339	0.270	79.676
1.220	0.147	0.217	0.338	155.455
2.398	1.307	1.624	0.915	56.330
1.028	0.120	0.256	0.358	140.042
1.979	0.504	0.372	0.586	157.355
0.419	0.130	0.257	0.077	29.938
0.629	0.206	0.126	0.182	145.091
1.227	0.162	0.258	0.338	130.647
1.484	0.194	0.549	0.380	69.201
1.324	0.224	0.288	0.364	126.607
1.461	0.686	0.785	0.355	45.264
3.766	4.270	3.313	1.153	34.803
4.824	0.878	2.312	0.977	42.251

Rumford Downstream Data July 2001 N=20 2 SPMDs per sample <DL=0

						Average Temperature	
						23.7909	
Congener	MDL*	SPMD 1	SPMD 2	SPMD 3	SPMD 4	SPMD 5	SPMD 6
2,3,7,8-TCDF	0.8			7.110	11.622	10.874	2.113
1,2,3,7,8-PeCDF	2.08			0.873	1.573	0.490	0.261
2,3,4,7,8-PeCDF	3.13			0.466	0.630	1.025	0.278
1,2,3,4,7,8-HxCDF	2.59			0.734	0.690	0.495	0.220
1,2,3,6,7,8-HxCDF	2.46			0.254	0.471	0.187	0.260
2,3,4,6,7,8-HxCDF	2.88			0.150	0.415	0.175	0.316
1,2,3,7,8,9-HxCDF	1.68			0.094	0.183	0.035	0.209
1,2,3,4,6,7,8-HpCDF	2.65			1.765	0.388	1.896	1.022
1,2,3,4,7,8,9-HpCDF	1.56			0.134	0.067	0.000	0.000
OCDF	7.18			0.650	0.000	0.000	0.547
2,3,7,8-TCDD	2.1			0.341	0.343	0.296	0.040
1,2,3,7,8-PeCDD	2.14			0.000	0.000	0.084	0.000
1,2,3,4,7,8-HxCDD	3.08			0.076	0.175	0.150	0.318
1,2,3,6,7,8-HxCDD	1.22			0.193	0.660	0.554	0.522
1,2,3,7,8,9,-HxCDD	2.84			0.239	0.314	0.318	0.237
1,2,3,4,6,7,8-HpCDD	2.31			0.948	1.537	0.872	0.522
OCDD	6.7			5.193	8.310	4.864	3.756
TEQ		0	0	1.532	2.211	2.224	0.627

			DOC 7/17	TOC 7/17	Sp. Cond.	Flow 7/13	
			6.0332	6.2299	95.26	2.6	
Congener	MDL*	SPMD 7	SPMD 8	SPMD 9	SPMD 10	SPMD 11	SPMD 12
2,3,7,8-TCDF	0.8	12.966	9.503	7.640	9.915	7.505	6.803
1,2,3,7,8-PeCDF	2.08	1.422	1.060	0.606	0.988	0.603	0.145
2,3,4,7,8-PeCDF	3.13	1.367	0.331	0.924	1.151	2.554	0.000
1,2,3,4,7,8-HxCDF	2.59	1.068	1.428	0.649	0.703	0.933	0.514
1,2,3,6,7,8-HxCDF	2.46	0.177	0.342	0.186	0.179	0.245	0.186
2,3,4,6,7,8-HxCDF	2.88	0.147	0.279	0.102	0.189	0.199	0.156
1,2,3,7,8,9-HxCDF	1.68	0.038	0.141	0.027	0.115	0.143	0.031
1,2,3,4,6,7,8-HpCDF	2.65	3.068	2.247	1.408	1.573	2.114	1.707
1,2,3,4,7,8,9-HpCDF	1.56	0.124	0.250	0.000	0.099	0.000	0.039
OCDF	7.18	0.000	0.679	0.366	4.036	0.000	0.531
2,3,7,8-TCDD	2.1	0.253	0.397	0.266	0.390	0.200	0.406
1,2,3,7,8-PeCDD	2.14	0.000	0.000	0.000	0.000	0.000	0.000
1,2,3,4,7,8-HxCDD	3.08	0.164	0.161	0.071	0.134	0.287	0.071
1,2,3,6,7,8-HxCDD	1.22	0.599	0.472	0.167	0.144	0.548	0.259
1,2,3,7,8,9,-HxCDD	2.84	0.140	0.288	0.057	0.286	0.314	0.176
1,2,3,4,6,7,8-HpCDD	2.31	0.914	0.957	0.706	0.794	1.453	0.746
OCDD	6.7	3.014	3.675	4.653	0.414	6.152	4.575
TEQ		2.579	1.911	1.670	2.207	2.561	1.258

Rumford Downstream Data July 2		DOC 8/10	TOC 8/10	Sp. Cond.	Flow 8/10		
		6.2	6.3	115.3	1.3		
Congener	MDL*	SPMD 13	SPMD 14	SPMD 15	SPMD 16	SPMD 17	SPMD 18
2,3,7,8-TCDF	0.8	4.733	4.529	7.177	6.874	9.484	8.823
1,2,3,7,8-PeCDF	2.08	0.160	0.150	1.234	0.527	0.753	2.429
2,3,4,7,8-PeCDF	3.13	1.782	0.000	0.432	0.000	1.322	2.166
1,2,3,4,7,8-HxCDF	2.59	0.611	0.505	0.628	0.499	0.847	1.421
1,2,3,6,7,8-HxCDF	2.46	0.164	0.169	0.184	0.344	0.266	1.176
2,3,4,6,7,8-HxCDF	2.88	0.146	0.138	0.210	0.264	0.194	0.857
1,2,3,7,8,9-HxCDF	1.68	0.040	0.055	0.000	0.197	0.092	1.453
1,2,3,4,6,7,8-HpCDF	2.65	2.218	2.628	3.448	1.351	1.584	0.708
1,2,3,4,7,8,9-HpCDF	1.56	0.023	0.074	0.000	0.189	0.119	0.681
OCDF	7.18	0.569	0.415	0.461	0.592	0.363	0.000
2,3,7,8-TCDD	2.1	0.503	0.443	0.289	0.372	0.566	0.825
1,2,3,7,8-PeCDD	2.14	0.000	0.000	0.000	0.000	0.017	0.864
1,2,3,4,7,8-HxCDD	3.08	0.063	0.051	0.220	0.166	0.128	1.207
1,2,3,6,7,8-HxCDD	1.22	0.209	0.226	0.508	0.473	0.446	2.083
1,2,3,7,8,9,-HxCDD	2.84	0.226	0.167	0.000	0.333	0.246	0.795
1,2,3,4,6,7,8-HpCDD	2.31	0.938	0.850	1.323	0.848	0.964	1.208
OCDD	6.7	6.087	3.690	6.114	3.790	3.001	3.806
TEQ		2.054	1.070	1.507	1.338	2.479	4.701

Congener	MDL*	SPMD 19	SPMD 20	Mean	Std. Dev.	%RSD
2,3,7,8-TCDF	0.8		3.987	7.745	2.870	37.057
1,2,3,7,8-PeCDF	2.08		0.187	0.792	0.618	78.062
2,3,4,7,8-PeCDF	3.13		0.000	0.849	0.790	93.039
1,2,3,4,7,8-HxCDF	2.59		0.500	0.732	0.325	44.334
1,2,3,6,7,8-HxCDF	2.46		0.266	0.297	0.241	80.910
2,3,4,6,7,8-HxCDF	2.88		0.235	0.245	0.175	71.453
1,2,3,7,8,9-HxCDF	1.68		0.136	0.189	0.332	176.171
1,2,3,4,6,7,8-HpCDF	2.65		1.863	1.823	0.780	42.814
1,2,3,4,7,8,9-HpCDF	1.56		0.160	0.115	0.164	142.436
OCDF	7.18		1.633	0.638	0.963	150.963
2,3,7,8-TCDD	2.1		0.249	0.363	0.170	46.704
1,2,3,7,8-PeCDD	2.14		0.000	0.057	0.209	368.147
1,2,3,4,7,8-HxCDD	3.08		0.112	0.209	0.268	128.186
1,2,3,6,7,8-HxCDD	1.22		0.504	0.504	0.440	87.316
1,2,3,7,8,9,-HxCDD	2.84		0.302	0.261	0.167	63.886
1,2,3,4,6,7,8-HpCDD	2.31		1.606	1.011	0.307	30.357
OCDD	6.7		14.044	5.008	2.891	57.729
TEQ		0.000	0.900	1.931	0.927	48.023

Jay Upstream Data July 2001 N=8 5 SPMDs per sample <DL=0 (ng/kg) — Average Temperature — DOC 7/17 N/A

Congener	SPMD 49^	SPMD 50^	SPMD 51*	SPMD 52	SPMD 53^	SPMD 54^	SPMD 55^	SPMD 56^
2,3,7,8-TCDF	2.319	2.374	2.849	2.522	2.238	2.124	2.228	2.187
1,2,3,7,8-PeCDF	0.606	1.000	0.941	0.683	0.709	0.610	0.675	0.683
2,3,4,7,8-PeCDF	0.772	1.120	1.027	0.847	0.739	0.732	0.860	0.724
1,2,3,4,7,8-HxCDF	0.399	0.838	0.548	0.459	0.376	0.384	0.455	0.398
1,2,3,6,7,8-HxCDF	0.145	0.469	0.182	0.144	0.156	0.101	0.130	0.146
2,3,4,6,7,8-HxCDF	0.126	0.373	0.225	0.146	0.125	0.094	0.097	0.088
1,2,3,7,8,9-HxCDF	0.057	0.390	0.128	0.043	0.071	0.048	0.045	0.043
1,2,3,4,6,7,8-HpCDF	0.273	0.819	0.363	0.262	0.230	0.184	0.399	0.240
1,2,3,4,7,8,9-HpCDF	0.080	0.422	0.175	0.107	0.134	0.058	0.103	0.066
OCDF	0.206	0.887	0.358	0.256	0.271	0.186	0.255	0.207
2,3,7,8-TCDD	0.115	0.238	0.158	0.141	0.095	0.127	0.131	0.190
1,2,3,7,8-PeCDD	0.098	0.447	0.186	0.079	0.135	0.069	0.113	0.074
1,2,3,4,7,8-HxCDD	0.076	0.368	0.103	0.061	0.109	0.076	0.105	0.071
1,2,3,6,7,8-HxCDD	0.626	1.058	0.321	0.655	0.655	0.472	0.853	0.547
1,2,3,7,8,9,-HxCDD	0.137	0.562	0.310	0.191	0.270	0.172	0.200	0.165
1,2,3,4,6,7,8-HpCDD	0.603	0.921	0.687	0.582	0.553	0.555	0.658	0.522
OCDD	1.444	2.205	1.754	1.528	1.253	1.305	1.446	1.275
TEQ	1.028	1.960	1.384	1.110	1.044	0.947	1.130	1.033

Jay Downstream Data July 2001 N=8 5 SPMDs per sample <DL=0 (ng/kg) — Average Temperature — DOC 9/22 N/A

Congener	SPMD 41	SPMD 42	SPMD 43	SPMD 44	SPMD 45	SPMD 46	SPMD 47	SPMD 48
2,3,7,8-TCDF	0.759	0.711	0.781	0.770	0.640	0.656	0.612	0.613
1,2,3,7,8-PeCDF	0.547	0.350	0.312	0.324	0.265	0.264	0.258	0.201
2,3,4,7,8-PeCDF	0.519	0.304	0.293	0.359	0.297	0.262	0.262	0.266
1,2,3,4,7,8-HxCDF	0.450	0.287	0.241	0.263	0.263	0.231	0.221	0.223
1,2,3,6,7,8-HxCDF	0.276	0.170	0.152	0.125	0.119	0.160	0.100	0.082
2,3,4,6,7,8-HxCDF	0.253	0.104	0.144	0.134	0.088	0.118	0.061	0.055
1,2,3,7,8,9-HxCDF	0.255	0.091	0.104	0.117	0.088	0.101	0.074	0.052
1,2,3,4,6,7,8-HpCDF	0.301	0.293	0.317	0.255	0.229	0.241	0.188	0.165
1,2,3,4,7,8,9-HpCDF	0.232	0.157	0.103	0.114	0.060	0.128	0.060	0.068
OCDF	0.405	0.371	0.344	0.333	0.287	0.368	0.304	0.228
2,3,7,8-TCDD	0.213	0.174	0.116	0.093	0.083	0.086	0.086	0.102
1,2,3,7,8-PeCDD	0.351	0.158	0.142	0.115	0.101	0.148	0.100	0.097
1,2,3,4,7,8-HxCDD	0.193	0.096	0.100	0.097	0.101	0.087	0.074	0.082
1,2,3,6,7,8-HxCDD	0.890	0.499	0.482	0.731	0.535	0.723	0.483	0.541
1,2,3,7,8,9,-HxCDD	0.354	0.198	0.154	0.157	0.152	0.156	0.131	0.099
1,2,3,4,6,7,8-HpCDD	0.453	0.461	0.504	0.415	0.386	0.368	0.343	0.303
OCDD	1.786	1.503	1.602	1.471	1.175	1.137	1.211	0.975
TEQ	1.205	0.726	0.646	0.651	0.552	0.609	0.512	0.522

FLAGS

M/z ion ratio
Surrogate recovery
Both M/z ratio and Surrogate Recovery
Retention Time

* Loss from GPC Clean Up Run
^ Deployed for 37 days
# All TCDD concentrations should be viewed with trepidation due to existing furan interference

Jay Upstream Data July 2C	TOC 7/17	Sp. Cond.	Flow 7/13	Flow 8/10	DOC 8/10	TOC 8/10	Sp. Cond.
	N/A	45.03	0.8	1.4	5.9275	6.3892	95.22
					Without SPMD 50 & 51		
Congener	Mean	Std. Dev.	%RSD		Mean	Std. Dev.	%RSD
2,3,7,8-TCDF	2.355	0.234	9.954		2.270	0.139	6.133
1,2,3,7,8-PeCDF	0.739	0.148	20.099		0.661	0.043	6.451
2,3,4,7,8-PeCDF	0.853	0.148	17.319		0.779	0.060	7.727
1,2,3,4,7,8-HxCDF	0.482	0.155	32.085		0.412	0.036	8.782
1,2,3,6,7,8-HxCDF	0.184	0.117	63.780		0.137	0.020	14.349
2,3,4,6,7,8-HxCDF	0.159	0.097	60.859		0.113	0.023	20.349
1,2,3,7,8,9-HxCDF	0.103	0.119	115.608		0.051	0.011	21.543
1,2,3,4,6,7,8-HpCDF	0.346	0.204	58.801		0.265	0.073	27.513
1,2,3,4,7,8,9-HpCDF	0.143	0.119	83.098		0.091	0.028	31.167
OCDF	0.328	0.232	70.627		0.230	0.035	15.063
2,3,7,8-TCDD	0.149	0.046	30.638		0.133	0.032	24.111
1,2,3,7,8-PeCDD	0.150	0.126	83.997		0.095	0.026	27.239
1,2,3,4,7,8-HxCDD	0.121	0.101	83.577		0.083	0.019	23.283
1,2,3,6,7,8-HxCDD	0.648	0.226	34.925		0.635	0.129	20.262
1,2,3,7,8,9,-HxCDD	0.251	0.138	54.936		0.189	0.045	23.895
1,2,3,4,6,7,8-HpCDD	0.635	0.128	20.158		0.579	0.048	8.249
OCDD	1.526	0.319	20.912		1.375	0.113	8.185
TEQ	1.205	0.332	27.539		1.049	0.065	6.233

Jay Downstream Data July	TOC 9/22	Sp. Cond.	Flow 9/27	Flow 10/20	DOC 10/20	TOC 10/20	Sp. Cond.
	N/A	76.94	0.75	0.67	7.7361	7.8293	134.6
					Without SPMD 41		
Congener	Mean	Std. Dev.	%RSD		Mean	Std. Dev.	%RSD
2,3,7,8-TCDF	0.693	0.071	10.289		0.683	0.071	10.439
1,2,3,7,8-PeCDF	0.315	0.105	33.179		0.282	0.050	17.755
2,3,4,7,8-PeCDF	0.320	0.087	27.015		0.292	0.034	11.779
1,2,3,4,7,8-HxCDF	0.273	0.075	27.558		0.247	0.025	9.913
1,2,3,6,7,8-HxCDF	0.148	0.060	40.369		0.130	0.032	25.005
2,3,4,6,7,8-HxCDF	0.119	0.062	52.298		0.100	0.034	34.149
1,2,3,7,8,9-HxCDF	0.110	0.062	55.956		0.090	0.021	23.910
1,2,3,4,6,7,8-HpCDF	0.249	0.054	21.712		0.241	0.054	22.250
1,2,3,4,7,8,9-HpCDF	0.115	0.058	50.768		0.099	0.037	37.993
OCDF	0.330	0.056	16.946		0.319	0.051	15.906
2,3,7,8-TCDD	0.119	0.048	40.459		0.106	0.032	30.446
1,2,3,7,8-PeCDD	0.152	0.084	55.561		0.123	0.026	20.774
1,2,3,4,7,8-HxCDD	0.104	0.037	35.749		0.091	0.010	11.058
1,2,3,6,7,8-HxCDD	0.611	0.151	24.810		0.571	0.109	19.147
1,2,3,7,8,9,-HxCDD	0.175	0.077	44.214		0.150	0.030	19.886
1,2,3,4,6,7,8-HpCDD	0.404	0.067	16.522		0.397	0.069	17.340
OCDD	1.358	0.274	20.218		1.296	0.230	17.739
TEQ	0.678	0.225	33.178		0.603	0.078	12.996

FLAGS

M/:
Su
Bo
Re

* Loss from GPC Clean Ur
^ Deployed for 37 days
# All TCDD concentrations