

Merrymeeting News

The Newsletter of Friends of Merrymeeting Bay • P.O. Box 233 • Richmond Maine 04357

WINTER 2004

*To Preserve, Protect
and Improve the
Unique Ecosystems
of Merrymeeting Bay.*

Friends of Merrymeeting Bay is a
501(c)(3) nonprofit organization.

Support comes from members' tax-
deductible donations and grants.

Education

Hands Around the Bay, Speaker
Series, field trips.

Conservation & Stewardship

Protecting natural resources through
private and public ownership,
easements and stewardship.

Membership Events

Paddle tours of the Bay, field trips,
conservation meetings, potluck
suppers and shoreline clean-ups.

Research and Advocacy

Water quality, data collection, toxics,
fisheries restoration.

On-Line

<http://knox.link75.org/mmb/>
fomb@gwi.net

Calendar

SPEAKER SERIES

**MARCH 11: The Not-So-Good Ship
Lollipop; Cruise Ships &
Wastewater in Casco Bay &
the Gulf of Maine: Joe Payne,**
Baykeeper, Friends of Casco Bay

**APRIL 8: Have Caged Mussels
Will Travel: Biomonitoring
Dioxins on the Kennebec &
Androscoggin. Ed Friedman,**
*FOMB, Kathleen McGee, Maine
Toxics Action Coalition, Mike
and Sandra Salazar, Applied
Biomonitoring, (in absentia).*

**MAY 13: Listen to the Water: Richard
Lee, Papermaker.**

ANNUAL CLEANUP

May 22: Contact Sarah Wolpow,
721-0941 or fomb@gwi.net

AND NOW A WORD FROM OUR NEW EXECUTIVE COORDINATOR...

A cousin of mine is the "Chief Knowledge Officer" for his organization. An impressive-sounding title, to be sure, but I've never been exactly sure what he does. Although he's explained it to me on multiple occasions, the information just doesn't seem to stick. Of course, a lot of important work is done by folks whose job titles cause eyebrows to rise and eyes to glaze over. In fact, my last job, at the University of Southern Maine, had just such an inscrutable title: "Student Director of Environmental Sustainability." What, you may wonder, is that?

So, it was with a smile that I set about answering my four-year old's inquiry about my new job as Executive Coordinator for FOMB. "Kira," I said, as her two-year old sister, Rae, trundled over to listen, "it's like this: We live in one of the most beautiful places in the world. Eagles fly over our rooftops, foxes run across our roads (remember the two we saw yesterday?), and fantastic fish swim just minutes from our doorways. People travel from all over the world to enjoy the things we get to do in our backyards: skate by ourselves on sleeping ponds, canoe down unnamed streams, gather apples from our neighbors, scramble through river gorges, and picnic on slabs of sunny granite. It's just great here, right?" Right, they agreed. Then I told them my job was to help protect all those special things. Simple.

Of course, it is not at all that simple. The last year and half I have been working on a Master's degree in Community Planning and Development at the University of Southern Maine's Muskie School. The only shinningly clear message from my coursework was the profound complexity of weaving together the health of our environment, our communities, and our economy. Yet, while we work through this balancing act and struggle to understand the chains of cause and effect, it is essential to keep in mind the big picture. And, the big picture for me has a lot to do with what we are going to leave our children. Do I want my girls to eat fish from Maine rivers without fear of toxins? Yes, I do. Do I want them to be awed by the dramatic spot on Merrymeeting Bay where the water from over one third of the entire state drains through a narrow channel less than 1000 feet across? Definitely. Do I want them to experience the Bay as the wild and special place that it still is? That's the goal! I'm excited to be learning the ropes here at FOMB and I look forward to getting to know and working with as many of you as I can.

Sarah Wolpow

FROM THE CHAIR: THE YEAR IN REVIEW

2003 was an incredibly productive year for our organization in many ways. Not only did membership increase substantially, but members were particularly active in huge volunteer efforts that brought us great success. Water quality monitors continued their 5th year of monthly data collection efforts that provided support for our successful Lower Kennebec reclassification proposal, upgrading the river from a "C" to a "B". Successful presentations to the legislative Natural Resources Committee in the past winter and spring that stressed scientific and legal defensibility in the DEP dioxin monitoring program, culminated in the implementation of a properly designed caged bivalve biomonitoring project during the summer in which approximately 40 volunteers took part. The project contractor, Applied Biomonitoring, who has run over 60 mussel projects said that our twin deployments had gone smoother than any in their past, an excellent reflection on our coordination efforts. Combining a record attendance at our two Bay Days with other educational outreach we served 700 area students, getting them into the Bay side environment with the help of close to

50 volunteers. The archaeology dig at Choice View Farm brought in many new members, more publicity than we could have bought, and created a new partnership with the Maine Historic Preservation Commission [MHPC]. The state archaeologist in charge of the dig noted that this dig was the most successful they had ever run in terms of public participation, due in large part to FOMB's planning efforts.

Partnerships were many [see accomplishments]. Some preexisting and continually vital, such as those with Bowdoin College, The Nature Conservancy, Friends of Casco Bay and the US Fish & Wildlife Service and some new like those with MHPC [noted above], Environment Canada, Gardiner Wastewater Treatment Plant, and [GASP!] International Paper. I want to thank all of our volunteers and all of our partners for helping us achieve some substantial accomplishments for an organization with about a 30K budget.

We have always looked at the Bay in a holistic manner and our accomplishments bear this out. Bay Days are a combination of education and research as well as a membership activity. The mussel study was a merging of research and advocacy and also provided an excellent opportunity for membership involvement. The Choice View Farm dig brought together new members and old, in a blend of land conservation and research. The Kennebec upgrade was a terrific mix of member involvement, research and advocacy. Our annual speaker series of course attempts to bring all of these pieces together and baring unusual competing events like the first bombing of Iraq or sub zero temperatures, generally draws an excellent crowd.

Towards the end of the year we

began our search for a new staff person. He/she would become our executive coordinator with a priority to assist us in addressing sustainability issues as well as fundraising efforts. These were primary goals that the Steering Committee spent much time on during this last year. We would like to broaden the shoulders of the organization, strengthen committees and boost volunteer involvement from a day here or there to more in depth involvement with our organization. Our E.C. search drew about 30 responses from as far away as India, and in the end, from a pool of many well-qualified candidates, we hired Sarah Wolpov who had just moved to Brunswick from New Gloucester with her husband and two children. Welcome Sarah, we look forward to working with you.

As most of you know, environmental protection has taken it on the chin under the current administration in Washington D.C. This trickles down to much of state government. State and federal resources are scarce and the political will to enforce existing environmental laws is lacking more often than not. Development flourishes and land prices are sky-high making meaningful land protection far more difficult yet more important than ever. In times like these your support financially, as an active volunteer, or perhaps as a conservation easement or land donor is critical to the health of Merrymeeting Bay and to our organization, that achieves with your help, so much. It continues to be for me, a privilege to serve our organization and to work with our many dedicated Steering Committee members and volunteers. Thank you all.

*Respectfully Submitted,
Ed Friedman*

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Merrymeeting News

is the newsletter of Friends of Merrymeeting Bay, P.O. Box 223, Richmond, Maine 04357, and is published seasonally.

Merrymeeting News is sent to FOMB members and other friends of the Bay. For information call Ed Friedman, Chair, at 666-3372.

FRIENDS OF MERRYMEETING BAY 2003 ACCOMPLISHMENTS

Media

Print: Approximately 17 articles:
 Archaeology, Education, DEP/Mussels, Land Conservation,
 Environmental Bond Issue
 TV: 2 Networks:
 Archaeology
 Radio: Maine Public Radio:
 Dam Removal/Fish Restoration

Membership

355 members [41 new members this year]
 Volunteer days - over 300
 Speaker Series - 500 people
 Paddle Series - 16 people
 Newsletters - 4

Funds Leveraged

\$190,000

Outreach Presentations

UMO MidCoast Senior College Kennebec Trip: 40 people
 Androscoggin Source to the Sea Trek-12 people

Education

Bay Day (600 students - up from 275 in 2002)
 Hall-Dale on the Bay (100 students)
 Curriculum Binder, increased distribution
 Web site updates

Conservation and Stewardship

Total Protected – 112 acres, 6,350' of shoreline
 Acquisitions [with The Nature Conservancy]
 Gallant - 25 acres, 3500' shoreline, 12 acres wetland, in
 Bowdoinham
 Peddicord - 33 acres, 1600' shoreline, 10 acres wetland in
 Bowdoinham
 Frye - 17 acres, Bowdoinham
 Easements
 One easement, 35 acres, 1250' of shoreline, Dresden
 Two easements in progress, 100 acres, 3600' shoreline in
 Richmond & Woolwich
 Stewardship
 First easement violation (ATV Trail) resolved

Research

Caged Mussel projects on Kennebec & Androscoggin
 Choice View Farm Archaeological Dig with Maine Historic
 Preservation Comm.

Coordinated on Invasive Plant project with The Nature
 Conservancy
 Water Quality Monitoring – 16 sites [up from 13]
 Water Quality Monitoring – applying for EPA Certification

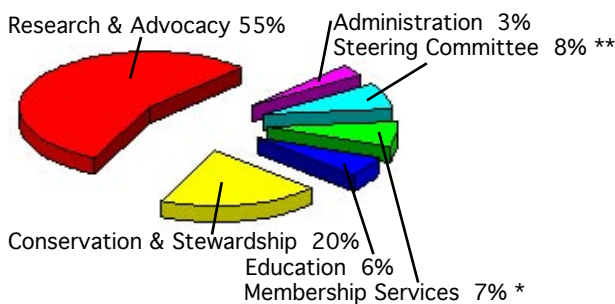
Advocacy (postings, letters, testimony, etc)

Speed Limit Signs
 Merrymeeting Bay Wildlife Sanctuary Signs
 SAPPI Relicensing Permit
 Kennebec River Reclassification Upgrade [SUCCEEDED]
 Sunday Hunting [LD 679 & 755]
 Water Reclassification [LD 1529]
 Organic Farming Incentives on Leased State Lands [LD 315]
 Limit State Land Ownership [LD 348]
 Atlantic Salmon Commission [Budget]
 Swan Island [Budget]
 Cumulative Effects on Protected Natural Resources [LD 242]
 Land for Maine's Future [LD 92 & 176]
 Limitation of State Funds for Land Conservation [LD 94]
 Dioxin Monitoring Program/Surface Water Ambient Toxics
 Program
 Fort Halifax Dam Removal [Federal Energy Regulatory
 Commission]
 Gardiner Wastewater Treatment Plant Upgrades
 Fish Consumption Advisories
 EPA-Right-To-Know Web Access, Toxic Use Reduction
 Gulf Island Pond

Primary Partners

The Nature Conservancy
 Bowdoin College Environmental Studies Department
 Department of Environmental Protection
 Department of Inland Fisheries and Wildlife
 US Fish and Wildlife Service
 Maine Natural Areas Program
 Department of Marine Resources
 Friends of Casco Bay
 Maine Toxics Action Coalition
 Applied Biomonitoring
 International Paper
 SAPPI
 Gardiner Wastewater Treatment Plant
 Maine Rivers
 Maine Historic Preservation Commission
 Environment Canada
 Maine Coast Heritage Trust
 Maine Wetlands Protection Coalition
 Patagonia Outlet, Freeport

HOW THE CHAIR SPENT HIS TIME

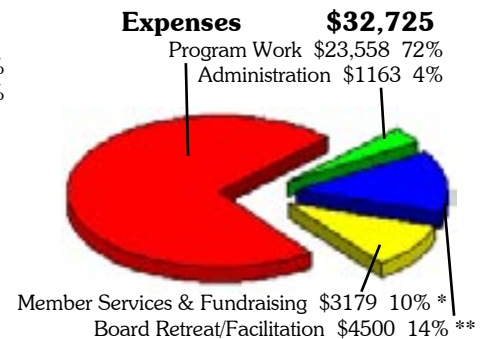
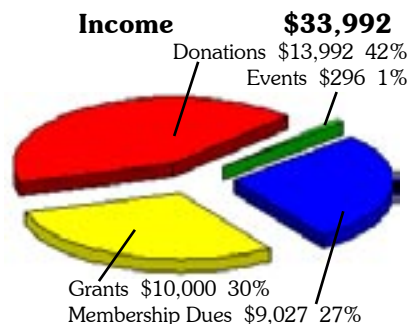


* Includes quarterly newsletter production and mailing

** One Time [hopefully] Event. Largely reflects major effort and expense of multiple Steering Committee meetings, facilitation and retreat.

Important to remember is that while our budget is relatively small, FOMB is exceptionally good at utilizing in-kind & small cash contributions to leverage funds from other organizations, companies, & state & federal agencies. In 2003 we leveraged approximately \$190,000 towards research & land conservation efforts. Your donations to FOMB go a very long way!

2003 FINANCIALS



Steve Taylor, [former] Treasurer

TIDINGS

Occasionally during the doldrums of midwinter, a friend used to take her children smelt fishing. She said there was a small magic in pulling one of the bright little fish into the snug improvisational domesticity of a smelt camp, with its sizzling stove, its single light bulb that dangled overhead, and the rough chairs or overturned buckets that served for furniture. "And," she said "In February, I'll settle for small magic."

And, in February, small magic is worth some small investigation.

Smelt belong to the genus *Osmerus*. They are relations of trout and salmon, and somewhat closer relations of the arctic grayling. All of their kinfish are, then, superlative game fish. Smelt would equal or exceed them if they were the size of salmon, or if we were the size of squirrels. Their

deeply forked tails and streamlined bodies belong to a fish that is built for speed. As their gaping, toothy smiles indicate, they, like bluefish, loan sharks, and high-octane C.E.O.s, are predators--they eat on the run and run on appetite. *Mordax*, the moniker for our particular species,

means something like *biting* (cf. *mordant*, as in *mordant wit*). A giant mutant mordant smelt of thirty or forty pounds would look a good deal like a barracuda; big schools of them could spread terror and mayhem among swimmers at Reid or Popham, wreaking havoc with the tourist industry. But I am not writing a screenplay here, so back to the small magic of the actual creature.

They are anadromous, summering along the coast, seldom more than a mile from shore and seldom in water deeper than 20 feet. In autumn, they move into estuaries and overwinter there, under the ice. They do not like warm water--the preferred temperature range seems to be from the low 40's to the mid 50's. The *Osmerus* genus is circumpolar in its distribution; our guy, *Osmerus mordax* (a.k.a. rainbow smelt, frostfish, icefish, leefish, eparlan arc-en-ciel) ranges coastwise from Labrador and Newfoundland as far south as Virginia, but is most abundant from the Saint Laurence River to Cape Cod. The Kennebec basin thus lies in the heart of its territory.

After ice out, they wriggle up brooks and rills to spawn. These are often very small streams that go dry by midsummer. Like salmon, but on a smaller scale, smelt require a swift current, well-oxygenated water, and an unsilted bottom to do the business of life. The eggs take anywhere from 11 to 29 days to hatch and are somewhat

more than 1/32 of an inch in diameter. At birth, the young are all of a quarter inch long--transparent ribbons equipped with a yolk sac and a pair of dark eyes, which are the most visible thing about them. They have the muscle tone and self-propulsive capability of damp confetti. Once they reach tidewater, they hang close to the bottom by day, and move up into the shallows to feed by night. When they are about an inch long, they form into schools, and feed largely on zooplankton. As they grow, their tolerance for salinity increases, and they make their way downstream, to richer and cooler waters.

At maturity, the males are smaller than the females, although this is not apparent after their first year, when both average about 5 1/2" in length. They continue to feed on zooplankton, but also small shrimp, mummichogs, and the fry of other fish. By the second year, the males in the only study I have managed to find averaged 7.4 inches;

the females 7.8. The fish are at this point sexually mature, and ready to spawn. Some die after a single spawning; many do not. In this, they resemble Atlantic salmon. By the third year, the males average 8.2" and the females 8.6"; by the fourth year, each sex has grown another inch, but



Smelt Beware... photo by Ed Friedman

the rate of increase seems to slow down thereafter. For all that, female smelt a foot long are caught fairly regularly by ice fishermen around the bay, and one hears occasionally of one that gets up to 14". The International Game Fish Association can tell you to the ounce what the world's record is for trout, grayling or salmon caught on any tackle, caught on fly tackle, caught on a 3 lb. test line, caught by a woman, caught by a minor, and so forth. IFGA lists the world record status of rainbow smelt as VACANT, which would seem to represent a golden opportunity for some ambitious angler. A female minor using a fly rod and a 3 lb. test line could garner at least four world records for a single fish that probably would not weigh a pound, soaking wet.

On her first spawning, an average female smelt in the study mentioned above carried something more than 33,000 eggs; by her third spawning, she carried about 76,000. Because they spawn in such small streams, they spawn at night, when gulls and great blue herons are off-duty. A female may spawn for as many as four consecutive nights; the males for as many as eight, and so the males substantially outnumber the females on any given night. Dipping smelt from the spawning streams on a cold spring night is a lively sport. In Maine, you are limited to not more than two quarts of smelt per night, if you use this method. (There is no limit on how many you can take from

an evening of fishing through the ice, and one hears tales of sportsmen staggering out of smelt camps lugging a five gallon bucket full of smelt in each hand).

Osmerus means something like *odiferous*--smelly, in other words. But the odd thing about smelt is that the odor itself is neither unpleasant nor fishy. It is slightly sweet--one could imagine it being used in a cold cream--and most people describe it as being cucumber-like. This odor disappears if the fish are frozen. The delicate patina of color on the silver flanks also disappears, almost as soon as the fish comes out of the water, but it remains a handsome little creature--the back a pale, watery green, and the sides opalescent and semi-translucent, as sleekly shining as the inside of an onion.

An additional oddity of smelt is that, in winter, they produce a protein that contains glycerol, which is an anti-freeze. Only a few species of fish (e.g., cod, some northern flounders, herring) do this. Aquaculturists are interested in artificially developing the same capability in penned salmon, which cannot move to deeper and warmer water, as their wild siblings do, and become stressed by the cold. Anecdotal evidence, which tends to be corroborated by breathalyzer data randomly collected by state officials, suggests that in the winter smelt fishermen themselves also may undergo significant modification of body chemistry in the course of an evening of sport, which causes them to stagger out of their camps even if, or particularly if, they are not lugging a five gallon bucket full of smelt in each hand.

The colonization of North America by Europe was an unmitigated disaster for almost all native anadromous fish. But for smelt, it was a mitigated disaster. Along the coast, the usual culprits--dams, pollution, siltation, overfishing--had the usual impacts. To get some idea of what was lost, we can look to historical records, and learn, for example, that a century and a half ago dip netters took 750, 000 dozen smelt from the Charles River in Watertown, just upstream from Boston. By my arithmetic, that is nine million fish. If they averaged even a quarter pound apiece, that is 1,125 tons of smelt. The whole place must have reeked of cucumber. On Prince Edward Island, where they have taken better care of their streams than we have, the commercial harvest still ranges between one and two hundred tons per year. This gives some idea of what we have lost.

But rainbow smelt, like Atlantic salmon, have landlocked populations, particularly in Maine. Landlocked smelt, like landlocked salmon, are smaller and darker than the seagoing versions, but are genetically indistinguishable from them. And they are, for better or worse, a species that can be "managed." The first experiment in smelt stocking may have been conducted by Francis Barnard, who was governor of the Massachusetts Bay Colony from 1760-69. He successfully introduced them into Jamaica Pond, just out from Boston. But the real boom in smelt stocking took place in the late 19th and early 20th centuries, fueled

by the smelt's reputation as a forage fish, upon which game fish could feed and flourish. The most decisive transplantation came in 1900, when smelt from a lake in Maine were introduced into Crystal Lake, in Michigan. It was assumed that this bunch of hapless and unnaturalized immigrants would be eaten for lunch, so to speak, by the big pot-bellied walleyes in the lake. By the time that the Fish and Game people in Michigan realized that the smelt had turned the tables, and were themselves flourishing on fingerling walleyes, it was too late. The smelt had made their way into Lake Michigan, where they went to work on the lake trout population, and spread from there into the other Great Lakes and down into the Mississippi-Missouri drainage. They also got into a great many cold water lakes throughout the upper Midwest and Canada, sometimes smuggled in as illegal aliens, and sometimes brought in as live bait, then dumped heedlessly overboard at the end of the day. So, as an invasive landlocked species, they have flourished at the expense of the natives, and benefited from the same human short-sightedness that has so drastically depleted their coastal populations. There seems to be no effective technique for controlling them, and they have actually become a species of some commercial significance in the Great Lakes, Lake Erie in particular.

The *Maine Rivers* website estimates that in what you might call Greater Merrymeeting Bay--the tidewater portions of the Kennebec, Androscoggin, Cathance, Abbagadasset, Muddy, and Eastern rivers--smelt number in the "tens of millions." (The same site estimates the alewife population for this area to be about a million). I have no idea how the figure was arrived at. I hope it is true--it would make me feel personally richer and, in the deepest way, more patriotic. But the figure frankly sounds fabulous to me, like the wishful budgetary projections of an incumbent administration.

Whatever their numbers, and whether out in the summer seas or under the ice in the doldrums of midwinter, smelt move in long, shimmering, crowded constellations of fish, all seemingly steered by a single impulse. They swirl, spiral, scatter, and coalesce again, veering and flaring in a perfectly synchronized choreography, like silvery filings within rapidly shifting magnetic fields. I've seen photographs of that.

The last thing you want to do, when you are trudging out to a smelt shack with your bait and your bucket and perhaps also some antifreeze for yourself, is to fall down into that dark, cold, liquid underworld beneath the ice. And yet there is an allure in it too, in even the possibility of the urgent, voracious, teeming, and utterly silent life that is, or may be, down there, and that, if you are lucky, may occasionally send a small emissary up to you, to occupy your thoughts. Or at least your frying pan.

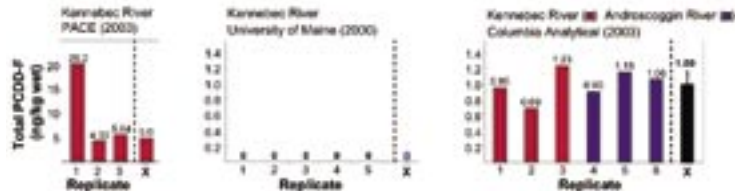
Franklin Burroughs
Tidings is a regular feature of Merrymeeting News

CAGED MUSSEL BIOMONITORING RESULTS

The results from our mussel studies are in and demonstrate that caged bivalves can be an effective surrogate for fish when monitoring dioxins & furans. This is so particularly when they are used to characterize current chemical exposures & possible ecological effects. While the primary goal of the mussel redeployment on the Kennebec, and initial deployment on the Androscoggin, was to evaluate the use of caged mussels as possible biomonitors of dioxin in the state's mandated "above/below" [A/B] test, we also wanted to determine if either the Sappi or International Pulp & Paper [IP] mills were currently discharging dioxins. On the Kennebec we also wanted to evaluate the mussels for possible endocrine system effects from the Sappi discharges.

As far as reliably discerning specific contaminant levels detected, there is a huge caveat and this would apply to fish and lipid bags [other monitoring methodologies] as well. In dealing with what appear to be very low contaminant levels, we are flirting with the analytical detection limits of the labs. For instance: In our 2000 study the baseline mussel tissues collected at the beginning of the test from Woolwich had no detectable concentrations of dioxins-furans as analyzed by the University of Maine in Orono [UMO]. In 2003 baseline tissues collected from the same lake as in 2000 were analyzed by two different labs. Columbia Analytical Services [CAS] in Houston [IP's contract lab] found average dioxin/furan concentrations of approximately 1 part per trillion [ppt] while Pace Lab in Minneapolis [low bidder for the DEP contract] detected levels of 5-20

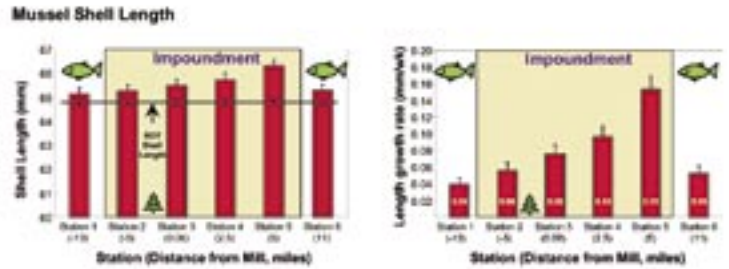
Beginning of Test Tissue Chemistry Results



ppt in split samples from the same tissues. [See chart] In 2000 UMO evaluated end-of-test tissues from the Kennebec using 150-gram sample sizes and detected 15 of 17 possible dioxin congeners [varieties] tested for, from two mussel cage sites 11 and 13 miles from the mill [stations 1&6]. In 2003 Pace evaluated the end-of-test tissues from six sample sites on the Kennebec [including 3 in the impoundment directly below the mill] using 30-gram samples and only detected 3 congeners. In light of these confounding factors it seems logical that the DEP would want to have some corroborative testing done using remaining tissue, by the same or third party labs.

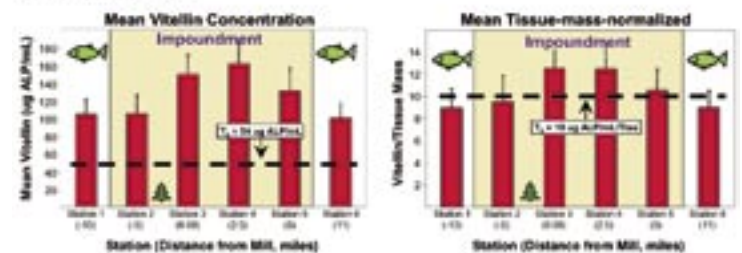
Discussions with analytical chemistry experts from a variety of labs who routinely run these analyses indicate that the more tissue used for analysis, the greater the potential to detect congeners but the greater the likelihood of sample contamination in the lab procedures. One EPA testing standard [1613B] commonly used by a number of labs is somewhat vague on details as well as being somewhat dated [for techniques that are constantly being improved]. Methodologies defined in that standard have now been supplemented or replaced by a number of specialty labs that use more sophisticated procedures. It seems clear that in the arena of analyses as well as other areas of the DEP monitoring program, that effective and defensible standards need to be decided upon in a transparent process with input from independent peer reviewers and stakeholders. Accountability procedures should probably be put in place before more funds are dispersed.

But, assuming for the moment that the chemistry numbers are in fact reasonably accurate, the data seem to indicate that neither mill is currently discharging the most toxic dioxin congeners. However, Sappi may be the source of some of the least toxic congeners generally associated with combustion [OCDD] and the town of Livermore Falls may be a contributor on the Androscoggin. The mussels deployed in the Kennebec show very clearly effects on growth as likely caused by the



mill both in tissue and shell weight and in shell lengths. [See chart]. The mill appears to be an excellent food source though as a blood test can demonstrate and as our mussels also show, that just because you appear fat, dumb, and happy, all is not necessarily well. When looking at the Kennebec mussels and comparing the old A/B stations [1&6], growth metrics are virtually identical at these sites 25 miles apart yet one can see evidence of very different growth patterns within the impoundment occurring in a gradient downstream of the mill. This gradient, suggestive of mill effects, illustrates the problem of using above and below sites so far apart [where the DEP fish samples are caught] that can clearly miss possible impacts from the mill.

Francois Gagne, Christian Blaise, and Chantale Andre, from Environment Canada's St. Lawrence Center performed a vitellin bioassay on our Kennebec mussels. Elevated levels of vitellin have been associated with possible endocrine system disruption and adverse reproductive effects. In a yearlong deployment of caged mussels exposed to wastewater effluent in the St. Lawrence River elevated vitellin levels were associated with sex reversals in mussels while the same effects have been observed in fish showing high levels of vitellogenin [the comparable compound for fish]. Elevated vitellin levels were very obvious in the



impoundment stations below the mill outfall [See chart]. The lesson here is that while dioxin discharges may have become minimal there are likely plenty more chemicals of possibly greater concern still being discharged in mill effluent [26 million gallons per day at Sappi]. This is why FOMB and other groups have continually pushed for closed loop or low flow water systems at the mills, a technology used elsewhere by some of the same companies. Also, as dioxin concentrations have fallen and consequently become more difficult to measure, a number of countries [such as Canada, Sweden, & New Zealand] have switched away from analytical chemistry to effects based monitoring. The DEP may also need to consider at least supplementing their analytical program with effects monitoring to acquire a more complete picture

Caged mussels would seem to be an excellent addition to the DEP monitoring program both for measuring concentrations and showing effects, and for doing so in a controlled way not possible with fish. One could even deploy mussels on the bottom and in the water column to determine differences between historical deposits and current discharges, a question that plagues fish testing but has yet to be resolved. A recently released report by an independent peer review panel noted that smallmouth bass tend to live and feed in the water column [perhaps being more representative of current discharges] while white suckers [nick-named "Hoovers"] spend their lives bottom feeding and are thus more exposed to possible historical accumulations. We arrived at this conclusion independently as we observed both levels of contaminants in white suckers and total possible dioxin "hits" to be substantially higher than with the bass. While fish may show a tendency

to preferentially accumulate the most toxic congener [2,3,7,8-TCDD] mussels seem to do better overall. Comparing the number of dioxin hits equal to or greater than the detection limit to a total possible from this year's Kennebec data; SPMDs [lipid bags] detected 9.2%, fish [smallmouth bass and white suckers combined] detected 9.4%, and mussels detected 16.3% of total possible hits. On the Androscoggin [with no congener specific data available for SPMDs] combined fish totals were 22.8% to the mussels 23.4%. In 2000 on the Kennebec it was SPMDs 6%, fish 20%, and mussels 38%.

At the lower limits of both possible dioxin discharges and analytical chemistry, regulation based on chemical measurements alone [as the legislation requires] appears to be problematic. If the years of DEP dioxin monitoring since the law went into effect in 1997 have shown one thing it is this. Filled with technical problems not well evaluated when the law was passed, the legitimacy of the A/B test may need to be reevaluated. While these two mills may now be in compliance as far as the dioxin discharges go we believe that the bigger issue to readdress, is that of the millions of gallons of wastewater discharged daily, with their host of unknown constituents, that do in fact show evidence indicative of harmful effects. Moving towards a new paradigm of effects based monitoring combined with analytical chemistry to provide a weight of evidence approach is perhaps the best way to move forward in our quest for cleaner rivers.

Your organization funded this study, dug deep, persisted in lobbying legislators, and has pushed DEP for answers to tough questions that should have been asked years ago. On more than one occasion I found myself exasperated, remarking to a legislator "this is not our job". FOMB has been very fortunate to work with the premier consultants in this field. They developed the ASTM standards for this methodology [requiring a three year

FRIENDS OF MERRYMEETING BAY

Steering Committee

Dorothy Chaisson, PO Box 36, Brunswick 04011	Treasurer	725-1487
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Dee Cummins, RR1 Box 112, Richmond 04357		737-4175
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peer review process] and their dedication has been unmatched. Our watchwords have always been: "transparency, scientific & legal defensibility" and the legislators concurred. Member support is vital to continue this type of work so essential for improving the quality of our rivers and the Bay. More information about this methodology can be found in the "cybrary" section of our web site and a report on the project will be presented at our April 8th Speaker Series event. There is a dedication at the beginning of the 1999 DEP publication

Biomonitoring Retrospective: Fifteen Year Summary for Maine Rivers and Streams that is apropos, it reads: "This work is dedicated to the smallest creatures, existing at the edges of our awareness. Through them we glimpse intricate realities other than our own, and we are reminded to stay humble."

Ed Friedman

Charts courtesy of Applied Biomonitoring

Friends of Merrymeeting Bay, P.O. Box 233, Richmond, Maine 04357

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HIGH VALUE HABITAT IN DRESDEN PROTECTED

Due to the foresight and generosity of Shelley and Margaret Rule, 35 acres of hard and softwoods in Dresden along with approximately 1250' of Kennebec River waterfront have been protected in perpetuity. Situated on the south side of Carney Point opposite the south end of Swan Island, the property includes the bedrock and lichen covered Hathorn Hill plus an additional 5 acres of tidal wetland considered Highest Value Habitat by the U.S. Fish & Wildlife Service.

The Rules, having owned this parcel for 44 years decided that the existing small camp should remain the only dwelling present on the property and that their love of the land could best be articulated by donating a conservation easement to FOMB. For several years we worked together with the Rules to come up with satisfactory language, work out boundary disputes and pull all of the documentation pieces together. On December 31st the easement agreement was recorded at the Lincoln County Registry of Deeds and protection efforts completed.

A conservation easement allows for land protection specifics to be negotiated individually between the landowner, or donor; and the easement holder, usually a non- profit charitable organization, in this case FOMB. Easement conditions may be "forever wild" or may allow for such things as agricultural, forestry, or recreational activities, and possibly even limited development. Conservation easements provide for permanent land protection while continuing private ownership. These protected lands may be sold or transferred in the normal manner while the conservation conditions remain attached to the property.

While love of the land is usually [and probably should be] the primary motivation for entering into a conservation easement, a bonus, depending upon the circumstances, *may* be a number of tax benefits including property tax reduction, a decrease in estate value, and a charitable deduction applicable to income tax. These well-deserved benefits reflect the very real gain to the public of habitat protection, ever more important in the face of increased development.

Our deepest thanks are extended to the Rules for their vision. Please contact FOMB [Ed Friedman 666-3372 or Andy Cutko, 666-3162] if you might be interested in learning more about conservation options for your property.

Ed Friedman

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