



Friends of Merrymeeting Bay (FOMB) is a 501(c)(3) non-profit organization. Our mission is to preserve, protect, and improve the unique ecosystems of the Bay through:

Education

Conservation & Stewardship

Research & Advocacy

Member Events

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

Merrymeeting News is published seasonally and is sent to FOMB members and other friends of the Bay.

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UNSEEN BUT EVERYWHERE

Rarely do we have an opportunity to explore new scientific instruments, the beauty of nature, and the most fundamental of food chain elements in the same project. This July, after percolating the idea for more than a dozen years, FOMB took an opportunity to probe the unseen but prolific phytoplankton (plant) and zooplankton (animal) community in Merrymeeting Bay (at a singular moment in time).



Unidentified zooplankton.
Photo: Fluid Imaging Technologies.

With cooperation from Fluid Imaging Technologies (FIT) in Scarborough we utilized their FlowCAM, the first automated particle analysis instrument using digital imaging, to measure the size and shape of microscopic life in Bay water samples. Developed by Bigelow Laboratory of Ocean Science and commercialized by FIT, this innovative tool is being used in oceanographic research, biofuels, oil spills, and municipal water applications. In our case, pouring 10ml from our 100ml water sample into the machine yielded more than 200,000 plankton images in seconds.

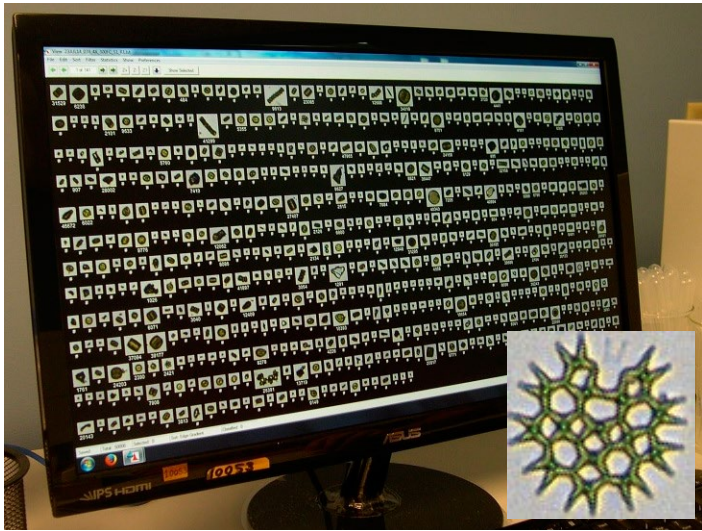
To our knowledge, while there have been a very limited number of DMR surveys (using 200-300 micron mesh nets) to sample for larvae and eggs of fish (ichthyoplankton), there have been no phyto or zooplankton surveys in the Bay (using the much finer mesh size of 20 microns).

With only a limited number of samples available, due to cost, we decided to sample the following three locations for theorized differences. The Eastern River is described as perhaps the most prolific (and turbid) of the Bay tributaries. We suspect out in the middle of the Bay above the Chops might be least prolific because of its depth, and since the Bay is known for its fish nursery habitat (in part for warm shallow water and dense plant growth providing cover from avian and fish predation), we made a tow in the shallows along Abbagadasset Point.

There are many variables to plankton sampling, including air and water temperatures, depth, water quality, turbidity, and others. Sampling goals can be variable; determining species presence, their relative abundance, species and or density differences in different depths or reaches of the same water body, or changes in populations over time (it's not uncommon for abundant phytoplankton blooms to be followed by increases [Continued on next page]



Retrieving plankton tow.
Photo: Jim Gillies.



A small sample of the many images. Inset: an unidentified phytoplankton. *Photo: Ed Friedman.*

in zooplankton to feed on the plant material, resulting in declines first of the phytoplankton and then the zooplankton; like lynx and snowshoe hare, or lemmings and snowy owls).

There is no substitute for regular sampling. What we just accomplished in this probe, a baseline sketch, is merely a slice in time giving us some idea of what planktons might be present in the Bay and an inkling of whether we might see differences between hypothetically different habitats.

At press time we only briefly scanned through the FlowCAM images and pulled a select few to illustrate a small variety of organisms. No species identification has yet been done but some resources are available to accomplish this.

A first glance, this sampling shows far more phytoplankton (than zooplankton) with seemingly the most variety from the Eastern River. The importance of these organisms cannot be overstated as they form the base of the Bay's prolific ecosystems. Their size probably makes them particularly susceptible to a variety of natural and anthropogenic influences whether flood flows, climate change, or various other inputs.

As we have seen with persistent toxins like mercury, which continues to accumulate in all Bay fish species, there is a documented need to understand how both nutrients and pollutants are affecting our fragile wildlife, small as they may be.

In addition to its scientific benefits, there is an aesthetic element to this project. Whether you think the plankton images are cool, gross, beautiful, or just interesting, they are an unknown to most of us and provide for many, compelling samples of art in nature. Reminiscent of the drawings by famed naturalist Ernst Haeckel, these beautiful photos can be used in our annual Hands Around the Bay education programming as an environmental art component to the 14 area schools with whom we work. The images will contribute unique visual aids helping explain ecological concepts like trophic levels and nutrient distribution while offering regional students another way to appreciate the Bay's inner workings.

Thanks to Harry Nelson, Bethany Brown, and Kent Peterson at FIT, Bowdoin's John Lichter for use of his plankton tow, and Jim Gillies for his skippering skills and boat.

Ed Friedman

ANDROSCOGGIN RIVER ALLIANCE: END OF AN ERA

The Androscoggin River Alliance (ARA) was catalyzed into existence in 2005 by proposed legislation to exempt the river's most polluted section, Gulf Island Pond, from meeting the lowest legal water quality standard. The ARA was initially started as a subgroup of Maine Rivers. Since the first days of ARA we focused on water quality, fisheries restoration, and educating the local citizens so they cared about their resource instead of ignoring it.

In 2005 we successfully appealed illegal 10 year discharge licenses issued to the paper industry exempting the Androscoggin River from minimum water quality standards. After years of effort led by the ARA, in February of 2008 the Maine Board of Environmental Protection voted to strengthen water quality standards to be met by mills on the river, and to shorten by half the time period in which the mills must come into compliance.

Feeling the Maine DEP's attempt to reverse the polluted state of our river was too little and too slow, the ARA in 2010 partnered with many local, state, and national groups to bring attention to our river's

plight. We focused on the river's worst polluter: Verso paper and their flagship customer, National Geographic Society (NGS). After publicly embarrassing NGS, they agreed to look into the problem. The added pressure from NGS forced Verso to implement relatively inexpensive fixes in their mill, significantly reducing their discharge into the Androscoggin.



Verso wastewater lagoon, several round secondary treatment tanks and then off to get de-foamed before discharge into the Androscoggin. *Photo: Point of View Helicopter Services*

Fish passage up and down the river is significantly compromised by multiple dams. The Brunswick-Topsham dam at head of tide is the first barrier encountered by migrating fish. This particular fishway was poorly designed and effectively blocks access to nearly the entire length of the river for American shad.

Studies by the Maine Department of Marine Resources (DMR) show the fishway at this dam is detrimental to the health of American shad trying to ascend to the point shad are reported “bleeding from the head and gills: as in years past.” In a 2003 telemetry study by DMR the department reported one shad tried 58 times in three days to ascend the fish ladder without success, before giving up and returning to tidewater.

In 2009 the ARA petitioned Maine DEP to list the lower Androscoggin River on their 303(d) list of water bodies not currently attaining water quality classification. Maine water quality law requires conditions suitable for the survival of its native species. Sufficient data were collected by Maine DMR over the last two decades concluding shad, although in the river below the dam, had no access to their migration and spawning habitats because of failures at the Brunswick

fishway. In early 2010, much to our surprise, the official 303(d) list was released and DEP listed the lower Androscoggin River on the non-attainment list under a non-pollutant cause sub-heading; the ARA prevailed setting national precedence for fish restoration efforts in many states.

The ARA funded the first ever tag and track program for salmon returning to the Androscoggin in 2011 and also increased the Atlantic Salmon Federation's Fish Friends program in the Androscoggin watershed. Fish Friends is a program educating school children about their local environment and Atlantic salmon. The program delivers salmon eggs to schools to be raised by the school children who ultimately release developed fry into the Androscoggin. That program now runs in schools from Bath to Woodstock.

The ARA started around the kitchen table and by its end in 2014 had become a model organization visited by foreign dignitaries and environmentalists from far flung nations such as Burma, Malaysia, New Zealand, Philippines, Thailand, and Vietnam. The ARA also garnered national attention for our work. In May 2009 the Sundance network aired, nation-wide, a new program called “ECO-Trips.” One of the first episodes was on paper manufacturing, featuring the Androscoggin River and the ARA. Our work was also featured on the National Public Radio program “Living on Earth” and the front page of the Boston Globe.

Neil Ward, former Executive Director

Editor's Note

It is with regret FOMB notes ARA recently closed its doors after 10 years of accomplishments. We appreciate their work under Neil Ward and could generally look to them as an ally in our own efforts to improve the lower Androscoggin. One last act of the ARA board was bequeathing to FOMB most of their physical assets (computers, software, projector, etc.) for which we are most appreciative. To the extent possible we aim to carry on their work.

Ed Friedman

THE KENNEBEC AT 15: WHAT DID REMOVING EDWARDS DAM DO?

The most fundamental right of owning property is you can build a wall around it. But what happens when that property is a giant block of concrete, steel and stone sitting across a river? This is where the law has been fuzzy since the Romans. The future of the Kennebec River depends on its resolution.

Dams are walls built across flowing rivers. They are not designed to be passable by fish or humans. The Kennebec has ten of these walls in the 80 miles from Waterville to Moosehead Lake. Beginning in 1837 the first wall was in Augusta. That wall, the Edwards Dam, was removed in 1999. For the past 15 years the first wall has been moved upstream to Waterville, 19 miles above Augusta. This dam, called Lockwood, was equipped with a “state-of-the-art” fishway in 2006. Nine seasons of intense study and observation have shown that it fails to do its job of passing fish. Above Lockwood are many more dams—none with fish passage, working or not.



Lockwood Dam in Waterville, new “first wall” on the Kennebec. The dam is between the bridges. Fish passage and trap are at far left of the lower power house/turbine structure. Because fish move upstream in response to flows, most move into the 1/4 mile section below the dam. Only a few find the meager attraction flow from the fishway downstream. *Photo: Point of View Helicopter Services.*

Too many celebrants of the Edwards Dam removal thought of the dam’s removal as the end of the battle for fish passage on the Kennebec. It was like Wilbur and Orville Wright thinking flying a homemade plane at Kitty Hawk meant the next day they would be flying across the Atlantic. The Edwards Dam removal, like the Wrights’ first flight, was a test flight. Nothing more, nothing less. We’ve now had 15 years to closely examine the “flight data” of the Edwards Dam removal. The verdict? It worked as a test flight—or as a baby’s first tentative steps.

Removal of the Edwards Dam has actually done more to restore the Penobscot River than it has the Kennebec. How? By technology transfer. This past fall, the Penobscot Restoration Trust completed the second leg of its \$60 million restoration plan by removing the giant Veazie Dam from the Penobscot’s head of tide. In 2012, the equally large Great Works Dam in Old Town, nine miles above Veazie, was removed. Without the successful test flight of the Edwards Dam removal, the much larger

Penobscot River restoration would never have left the ground. Edwards was to the Penobscot as the Wright brothers were to Charles Lindbergh.

The Kennebec has languished and fallen from the public eye for the past 15 years, in part due to the massive shift in public and private conservation resources to restoring the Penobscot. Removal of the Edwards Dam cost about \$3 million; the total Penobscot project cost is over \$60 million. That’s a 20x difference. Today, the Penobscot is still awash in restoration monies. The Kennebec is bankrupt. I do not begrudge this giant shift in resources: I endlessly argued for it. In 1999 we needed to save the Penobscot—to give it the initial salve of healing we had just given the Kennebec at Edwards. But due to its incredible success, the Penobscot project itself is starting to wind down.

The years 2000 to 2009 stood as a material test of whether the hopes, predictions and aspirations of the 1999 Edwards removal would be fulfilled or discarded like parade confetti. In 2005, Friends of Merrymeeting Bay took the lead in testing in court whether the promises so floridly made in 1998 and 1999 were being delivered—or would ever be delivered. From painful experience we learned (a) no; and (b) not likely. When dedicated state fisheries biologists helped FOMB raise the alarm about massive kills of American eels at dams on the Kennebec and its tributaries, we learned they were threatened with punishment for simply reporting what they saw. Something

clearly had gone askew from the bright promise of July 1999.

Alone among all conservation groups in Maine from 2000-2010, FOMB was willing to call a spade a spade, or a dead fish a dead fish, or hundreds of dead fish hundreds of dead fish. Because I can be rightly accused of a massive lack of objectivity in these matters, I point to a few key points of checkable fact. Since 2005, all of the basic biological and legal points first raised by FOMB alone on the Kennebec River have now been fully embraced by the larger environmental community in Maine. It just so happened that FOMB pointed them out five to seven years before they became mainstream. In essence, FOMB has created the mainstream. Conservation is based on science. Science is based on empirical observation. When the facts don't fit your plan, you don't revise the facts. FOMB has never forgotten this. If it's the pioneer who gets the arrows in their back, FOMB is a porcupine. And I find porcupines cuddly.

Restoring the natural vitality of the Kennebec is no easier or harder than trying to remove the Edwards Dam in the 1990s; or cleaning the river of its gross pollution in the 1970s. In the 1990s nobody in Augusta could remember the river without the Edwards Dam. A child born since 1999 has no memory of it ever being there. A woman or man who died in 1980 had no memory of the Kennebec ever being clean. A child born after 1980 has no memory of the river being grossly polluted. The loss of cultural memory works in odd ways.

In my darkest hours, late at night, I wonder if the Edwards Dam removal will be like the Apollo missions—a singular moment of advancement which we then turned away from. The Penobscot project says the Edwards Dam removal is not like Apollo—its motive energy can be sustained and expanded. But where to next? I say right back to the Kennebec, where it all started, so we can finish the job left undone on July 2, 1999. Will it be hard? Yes. But what part of removing Edwards was easy?

Douglas Watts is a conservationist and journalist. His book, [Alewife](http://www.lulu.com), is available at www.lulu.com

DAMNATION: Editor's Note

Most conservationists are overjoyed to see these dams come down, habitats revived/conserved, and migratory fish given another chance to succeed. However, many of us also believe the way these events came to pass is; corporate welfare, blackmail, or extortion. These rivers belong to the earth, citizens, and wildlife depending on them. They are a commons. They should be wholly owned by those entities. Think of dams as cash machines: the water flows through the turbines and hundred dollar bills are generated for their owners, 24/7. Dams are private profit-making operations yet they abuse and often destroy public resources; rivers and the aquatic life in them. They are cash cows, needing very little capital investment, while destroying the ecological balance of what are essentially arteries of the earth.

The removal of Edwards set a good (removal) and bad (paying to do so) precedent. Removal of the Penobscot dams continued the bad precedent with a 20-fold cost increase (a so-called bargain price) from Edwards. A recurring model of dam removal in Maine seems to be one or more river groups and/or agencies coming together to buy out a dam owner. Along with setting the precedent that we negotiate with terrorists and pay the ransom, we have now traded a corporate owner of the river resource for another non-public "owner" of the river, rather than it being a public common. Often after these private organizations obtain ownership, they too refuse to enforce terms of fish passage agreements while also extending fish passage deadlines for dams upstream of those which were bought out, as part of "The Deal" with corporate owners (upstream).

Precedent is now set that, even in regard to living creatures, to those extirpating species (i.e. Atlantic salmon) in a public resource, the public must pay to remove the cause. All the while, corporate entities continue to create personal profit from public resources. Paying dam owners to remove their dams, whether the multi-national and multi-billion dollar companies like Brookfield Asset Management (the Canadian owners of most of our hydro dams) or the occasional smaller owner is not just extortion, it's not a sustainable or just way to restore our rivers. We not only don't have that amount of cash, it is unethical to expect the public, and our wildlife, to pay the ransom.

Does the end really justify the means? Who is considering the long-term downside of paying off the blackmailer? Dam owners don't even pay into a fish restoration fund based for instance on the kilowatts they generate. According to the Maine Natural Areas Program something like 60% of our biodiversity lives in and along our rivers—the riparian corridors. Why do we continue letting private entities control these vital arteries? I ask the rhetorical question; what happens when our arteries are blocked? Perhaps it's time to take back our power?

Ed Friedman

THE WOODLAND BIRDS OF MERRYMEETING BAY

As a newcomer to Brunswick, I knew little about Merrymeeting Bay or the six rivers flowing into it before I moved here. Though I had lived along the banks of the Androscoggin in Livermore Falls, and knew of the Kennebec from numerous trips to Norridgewock, I had no idea what a special place Merrymeeting Bay was. Moving to the area as a birder, I am only just beginning to discover the vast birding it offers. I have heard of the flocks of waterfowl that gather here during migration, though I have yet to see this for myself! I have seen the bald eagles and now the ospreys flying overhead, but it is the small and sometimes forgotten birds along the shore that interest me.



Red-eyed vireo. Photo: Kathie Brown

In May I had the opportunity to help with FOMB's Bay Day at Chop Point. Having never even heard of that place—never mind having visited it—it was quite an adventure getting there. Though I was there to lead bird walks for the students, I could not help looking for birds as soon as I parked my car. May is prime migration time with warblers and vireos flitting through the trees. Walking across the soccer field I heard and saw northern parulas, a small gray warbler with a bright orange and yellow throat. Walking up the path towards the camp an eastern towhee popped up on a twig, its bright orange breast contrasting with its black back and white belly. To the untrained eye, one might think it was a robin, but it is a sweet woodland

bird more closely related to sparrows than thrushes and one can hear its “drink you TEA” song ringing through the Maine woods. Later, as I returned to my car, a chestnut-sided warbler sang to me from a sapling along the woodland edge. Its cheerful song sounded like it was saying, “Pleased, pleased, pleased to meet you!” Until I moved to Brunswick, I had never seen so many of this species in my life! Yes, Mr. Warbler, pleased to meet you too!

Many of the birds seen along the banks of Merrymeeting Bay are woodland birds that eat insects and are rarely seen at feeders. These birds depend on woodland habitat and the insects found therein. Besides the woodpeckers that we all love to see, there are several species of vireos and warblers in Maine. My day at Chop Point yielded five species of warblers, a red-eyed vireo, and a scarlet tanager, as well as many others for a total of 27 species of birds. All of these small birds are as important to Merrymeeting Bay and its ecosystems as the ducks and raptors are.

My interest in the smaller birds led me to the Androscoggin River in Brunswick recently to see what would turn up there. Though it is a well-traveled bicycle and pedestrian path, I was still able to find many species of small birds. I headed down the path one July morning under the steel girders of the train bridge, and then under the more substantial bridge of the bypass. Walkers and joggers passed me by, as did bikers and people with dogs headed for the dog park. I must have looked a sight with my binoculars on my chest, my camera slung over my shoulder, and my sage green birding hat with its wide brim to shield my eyes from the sun. I soon tuned out the sounds of the passing traffic and focused on the birds.

The first bird I heard was the song of the red-eyed vireo calling from the woods. I heard several of these along the one mile stretch I walked. Of course I spotted a robin or two, as well as a pair of pigeons snuggled up under the bridge, but the real delight was a pair of house wrens found in the hedgerow by the soccer field where they scolded me from deep in the shade of the bushes. All along the path I saw and heard song sparrows. They were, by far, the most numerous species of birds seen in the two and half hours it took me to walk a mile and back (yes, when I am watching birds, I go rather slowly, and listen to everything around me—the sounds of nature and the gentle lapping of the water along the shore.)

I looked into the amber-colored water, rich with tannins as it flowed gently past. Farther out the water of the

WE NEED YOU! PLEASE SUPPORT OUR IMPORTANT WORK

FOMB Leadership

Our accomplishments are due to the hard work of dedicated volunteers, especially those who serve on our committees. If you want to get involved and serve, please contact the committee chair or Dup Crosson. We always welcome member input and we'd love for you to join us!

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\$7 Enclosed (optional) for a copy of *Conservation Options: A Guide for Maine Land Owners* [\$5 for book, \$2 for postage].



Thanks to Will Zell from Zellous.org for newsletter layout.

Androscoggin was steel gray and rippling, belying its depth and the speed of its flow. I did not see any ducks on the water on this day, but a double-crested cormorant came gliding in to land, its feet splayed as it hit the water. Later on an osprey flew overhead, following the river like a road as it flew south.

In a little wooded copse I spotted chickadees among the branches, along with a downy woodpecker clinging to a tree trunk in his black and white spotted coat. He gave himself away when he called out with his sweet descending call as he moved from tree to tree. But it was the warblers I was after! There must be warblers here, along this riverfront! And then, I spotted them. High in the translucent green tangle of the tree canopy, two American redstarts flashed their tail and wing feathers at me! These small gray and yellow-orange birds were females of the species and use the tail and wing flicking to signal other birds and flush insects from their hiding places to be gobbled up. Just a bit farther up the trail I found yellow warblers searching through the branches of an overhanging oak tree for food. Along one of the tree limbs a white-breasted nuthatch foraged.

This part of the Androscoggin River is just before it flows into Merrymeeting Bay. I hope to explore more of the rivers that flow into the bay and learn more about the ecology of this area.

Kathie Adams Brown



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THWINGS POINT ARCHAEOLOGY CONTINUES

FOMB conducted our fourth dig at Thwings Point in Woolwich between July 7th and 18th. Important historical papers were signed here in 1652 at Ashley's Tavern establishing the first European government structure in the Bay area. FOMB led the way to protect this property a number of years ago and continues to take the lead on archaeological digs at the site and others in the area.

In past years we unearthed two cellar holes containing a great many artifacts from the 17th, 18th, and 19th centuries. Our goal this year was to map out the actual perimeters of the holes. We were successful on one hole but prolific poison ivy put a temporary stop to activity on the second hole. Chances are good we may return at a future date.

The dig was run by former historic geologist at the Maine Historic Preservation Commission Lee Cranmer with assistance from Kathy Bridge, still working for MHPC part time. Our thanks to you both, as well as special thanks to Dig Coordinator Sarah Cowperthwaite! We will present more information in a later newsletter once Lee's report is complete. Meanwhile we'd like to thank the 25 volunteers who made it happen and especially property owners Claire and Michael Robinson and Moody's Financial Services for substantial funding.

Thanks to: Lee Cranmer and Kathy Bridge. Volunteers: Sarah Delaney, Karen Dudra, Cyrus and Jessica Emmert, Alison Linsley, Christine Klinect, Terri Parker, Gerald Bigelow, Scott Herring, Sarah, Eli, and Stephen Cowperthwaite, Lisa Kane, Joan Tourtelotte, Matthew Mueller, Kate Samowitz, Claire and Michael Robinson, Ted and Susan Batutis, Hilary Warner-Evans, Thomas Hughes, Linda Heller, Kathy Goddu, and Mary Perkins.

Mark your calendars; Fall Bay Day on September 23rd in Bowdoinham.
Contact us at 666-1118 if you'd like to volunteer!