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Image credits on "Acknowledgements" page 26

Message from the President

The US Army Rangers have a motto they earned as a result of scaling the cliffs at Normandy during the D-Day landings, "Rangers lead the way." Just as I am proud to have served as an Army Ranger in Vietnam, so too am I proud to be a member of the Jones River Watershed Association, an organization that is leading the way when it comes to caring for our environment; crusading against the dangers of having a nuclear power plant on our seacoast, working to restore fish migration, warning against the consequences of sea level rise, and on and on.

The JRWA could not exist without the membership of environmentally-conscious individuals like yourself. Thank you for your support of our organization. And if it is to lead the way, an organization must have solid leadership. We are fortunate to have that with Executive Director Pine duBois, Ecology Director Alex Mansfield and Cape Cod Bay Watch Program Manager Karen Vale. They have continued to work tirelessly this past year fighting for our causes.

To support the leadership team, an active Board of Directors is required and again, and we are fortunate to have some of the best. Treasurer Karon Wierman has taken a huge load off Pine's shoulders by producing detailed and accurate financial reports and helping create an annual budget. It has been a pleasure to work with Karon, secretary Bob Weber and our other Board members who give their time to attend meetings, which can often be lengthy due to the amount of material covered; ranging from Monponsett Pond, the Tri-Basin Restoration Initiative, herring migrations, salt marsh sensing and Pilgrim, to name just a few of the issues we deal with. Read through this annual report and you will get an idea of the extent of the work carried out by the JRWA this past year.

Finally, a sincere "thank you" goes out to Peter Arenstam and his dedicated crew of volunteers who are at the Landing every Wednesday night and frequently more often than that, building and restoring boats while completing projects such as putting a wooden floor in the boatshop. Thanks also to all who volunteered to split and stack wood used to heat the Landing, bring food to poluck suppers and social events or contribute in some way to keep the Landing functioning. We couldn't do without you.

This will probably be my last *President's Message* because I am working on a project that will frequently take me out of state in the coming year and I think it is important to have a president who remains close at hand. But if the JRWA will have me, I hope to remain on the Board and will try to plan my trips south so as not to miss meetings. It has been an honor to be associated with all of you and I look forward to working with the JRWA in the year ahead.

– **Rick Stetson**, JRWA Board President



Year of Living Dangerously

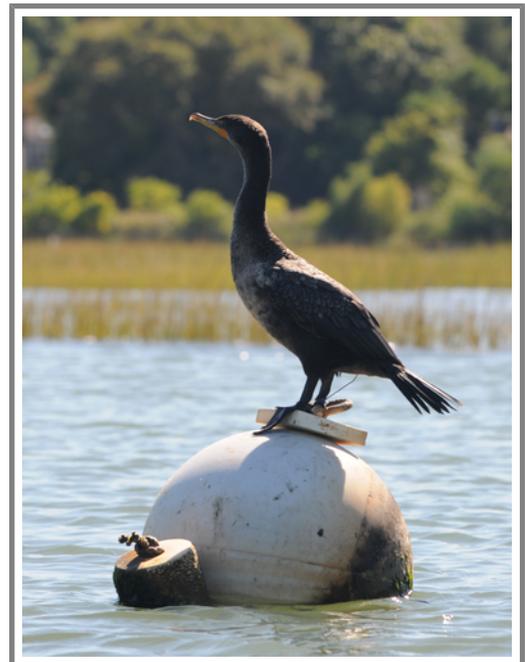
2014 was a strange and almost surreal year. Frightening, at the very least, to the multitudes that live in war-torn parts of the globe, filled with political and violent strife; or in places with catastrophic weather, tornadoes, mudslides, erupting volcanoes, and the like. The Ebola epidemic is cause for our concern at least because it shows us how vulnerable we really are, how fragile the balance is between health and suffering, between life and death. The Nature around us is changing too, with melting glaciers stranding tens of thousands or more of ice loving creatures with no place to rest, feed, or breed, while at the same time beginning to drown Island Nations. Here in the Gulf of Maine, our fish are pushing north as the waters outside our coast are warming and rising faster than the rest of the globe, and acidification in shellfish is being seen. The world as we know is changing in front of our eyes. It is exploding, erupting, evaporating, and blowing in ways not experienced in our human history. Seven billion of us burden the planet with expectations that need to change in order to spread precious natural resources around – and make it possible to evolve to better living. Is “sustainability” in the cards? How “resilient” are we?

Here at our home on the banks of Jones River, we take a stand. Here, we make it our work to understand the nature and community around us. Here we count fish, track water quality and sea level rise, and argue for the politics of conservation – on all fronts, especially energy and water – but also on land, for the pollinators and soil that bring seed to bear fruit. Here we build community so that we have a fighting chance as the world turns and becomes stranger than fiction. Here, we build boats – call it our Ark.

Despite the strife in the world around us, we are making progress on this home front. With our contributing initiative, and piles of volunteer work, we are witnessing growth in the Central Plymouth County Water District to alter management of the Silver Lake water supply network. We are making insightful progress to understand the way our water system works through the efforts of math, science and our partners’ development of flow models. We are cracking the armor of the Elm Street Dam, as the dam itself is cracking, and are waiting for the Department of Fish & Game funded site Reconnaissance Report for the Town of Kingston. And, we are applying new tools to demonstrate what we know to be true: that Pilgrim Nuclear Power Station sits too close to the sea, and must retreat!

Life as we have known it is history, any parent will tell you so. It is what we do this year that will make all the difference. Solve trivial political disputes. Come to grips with our negative influence on global climate. Resolve the damage of relic dams by tearing them down and encouraging the fish to do their thing. Find ecologically friendly ways to resolve the pest issues so we are not our own undoing. Liberate our brains from the shackles that bind us. Be kind to the planet, and with each other – we will find a way to float our boats.

– **Pine duBois**, *JRWA Executive Director*



Ecology Program



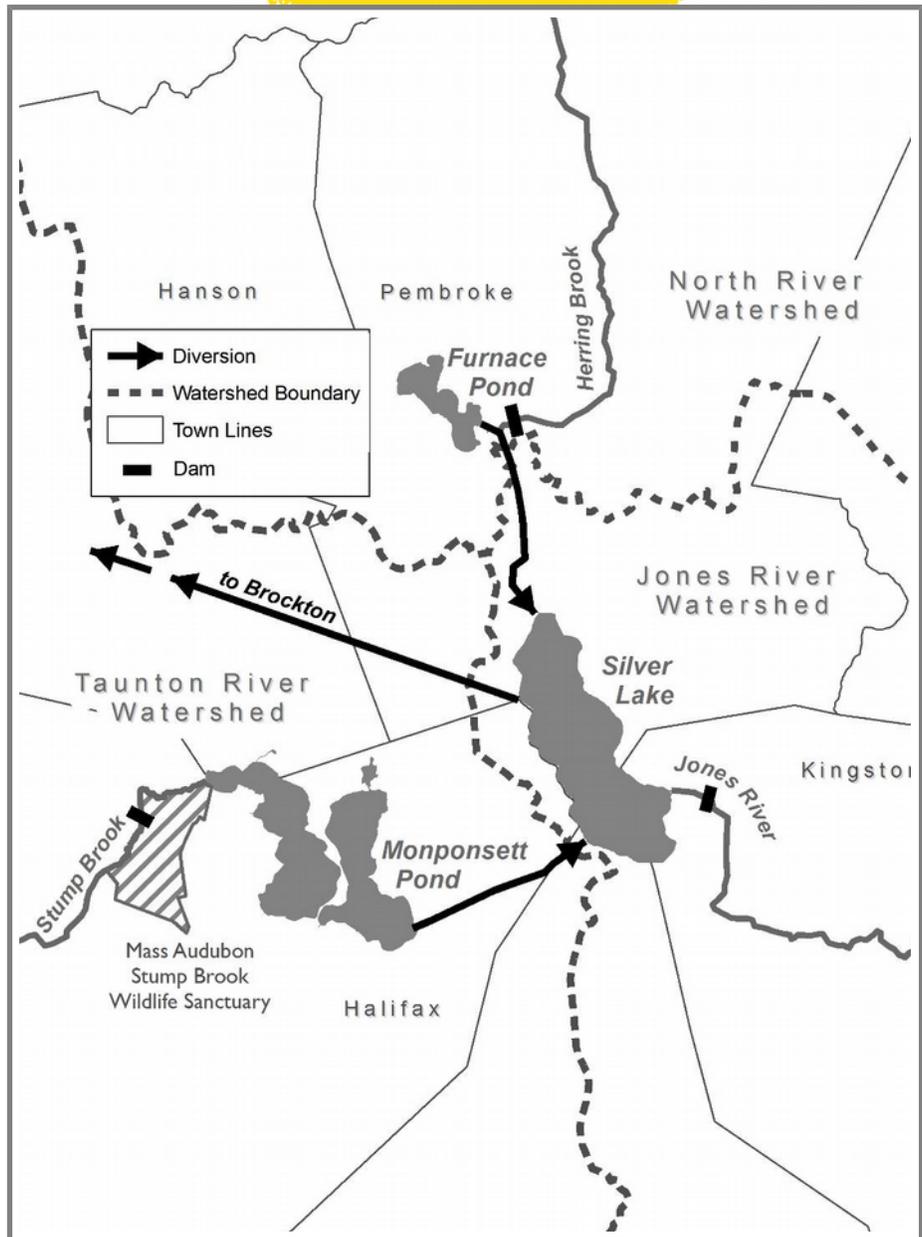
Tri-Basin Restoration Initiative

One of the things I love about the Jones River Watershed is that you can wrap your arms, and your head, around it. It's a fairly self-contained entity. The Jones River is entirely in Kingston and the watershed is mostly in Kingston. You can paddle the whole river in a day. You can get to know every riffle and pool. That's not to say that it's simple. Not at all! But you can see it all and take it all in.

Our primary motto in the Ecology Program at JRWA is: *Everything is Connected.* One thing that means is that our cozy watershed is connected to a larger world. We are both receivers and contributors in that larger world. The river herring that

spawn in our waters have traveled the coastline. Our American eels began their lives in the Sargasso Sea off Bermuda, and that's where they will return to spawn and die. The runoff from our roads, lawns, and farms is headed to Cape Cod Bay.

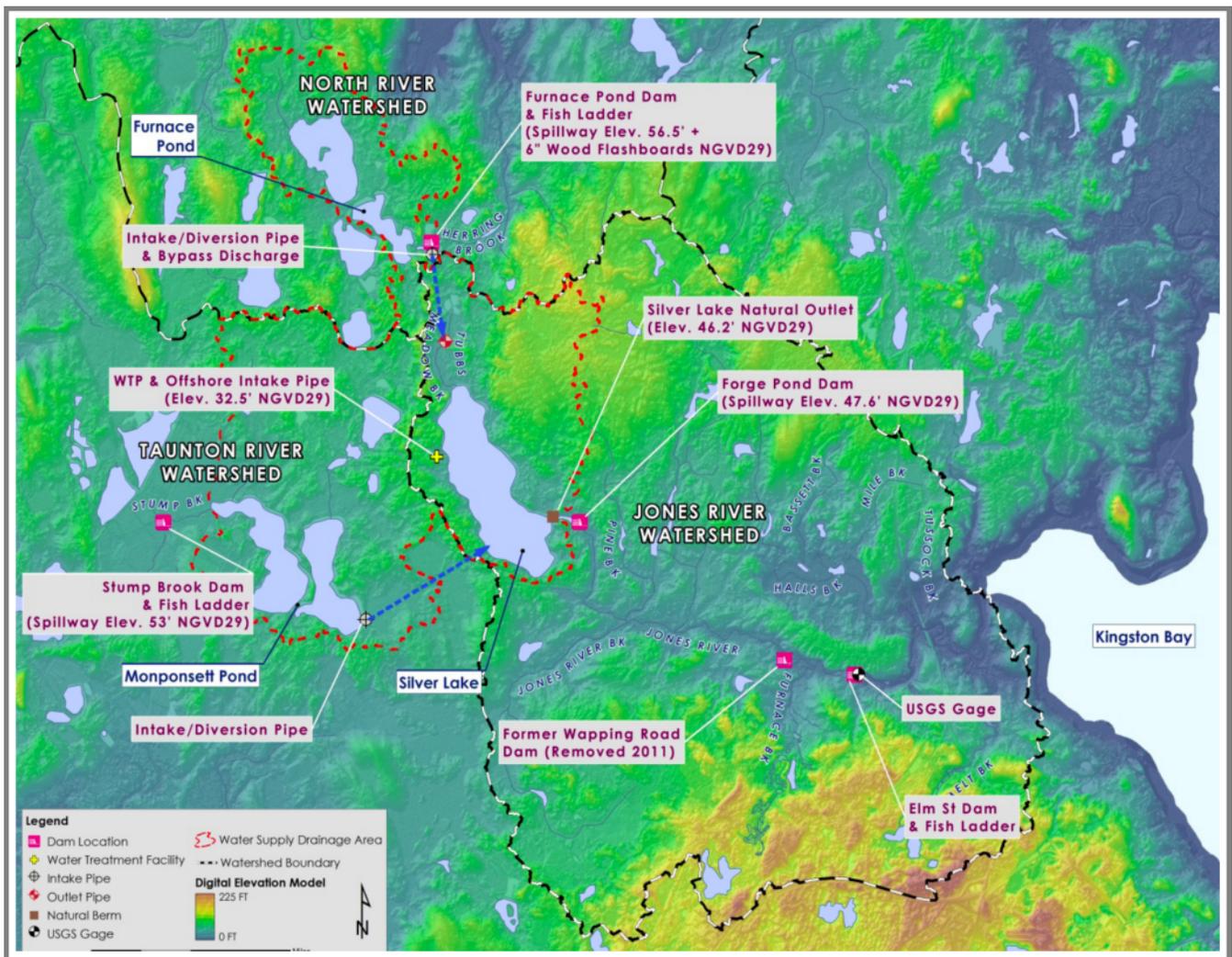
It's not that we haven't always known this, but it really hit home when we started pursuing fish passage at Forge Pond Dam. Unlike Wapping Road Dam, the key players and factors on this project aren't in our town or watershed. The City of Brockton is the big player, taking so much water from Silver Lake that the natural flows which used to support healthy fish runs just don't exist anymore. This is compounded when Brockton moves water from Monponsett Ponds (Halifax & Hanson) and Furnace Pond (Pembroke) into Silver Lake. This has impacts on those other towns and the watersheds of the Taunton River and the North and South Rivers. Those



towns in turn are connected to other communities. Water quantity, water quality, seasonal cycles, fisheries behavior, public finances, public health, property values, etc., are linked and impacted across the whole region as a result of these water management decisions.

So we had to connect to the bigger picture. In early 2013, we developed the “Tri-Basin Initiative” as a way to address the connected issues in a holistic way. Tri-Basin refers to the watersheds of Jones River, North and South Rivers, and Taunton River. Silver Lake is the functional center of the issues that link these three basins. Grant funding by DER in 2013 for the Town of Halifax was linked to our Tri-Basin Initiative, and took a big step forward in identifying the historical water management decisions that have harmed the region and the options to repair the damage. That process also forged new relationships between JRWA and the City of Brockton that are working productively towards common benefit.

Subwatershed boundary map for the primary sources of Brockton’s water supply system and individual water supply unit drainage areas – Created by Princeton Hydro, from the SWMI 2013 Report



**JRWA is involved with a number of efforts under our Tri-Basin Initiative.
These include:**

Monponsett Pond Issues and Working Group

Silver Lake receives up to 30 million gallons (seasonally) per day from the Monponsett Ponds in Halifax and Hanson. This is a completely man-made connection built and operated by the City of Brockton. The water is transferred to Silver Lake to provide additional drinking water supply for Brockton, since Silver Lake on its own cannot provide enough water for the City. Of course, managing water in unnatural ways disrupts nature. In this case, the consequences include:

- Lack of flushing in Monponsett Ponds, which exacerbates harmful algae blooms (*pictured below*).
- Lack of flow to Stump Brook in Halifax.
- Flooding of septic systems around Monponsett Ponds.
- Reduced recreational opportunities, impaired aesthetics, reduced property values, and other social impacts around Monponsett Ponds.
- Municipal cost burden in Halifax and Hanson to address these impacts.
- The transfer of nutrients, algae species, and other water quality impairments from Monponsett Ponds to Silver Lake.
- Increased flooding in the Jones River and Kingston.



In light of these concerns, the Monponsett Watershed Association was formed (MWA). JRWA met with the newly formed MWA early on to discuss common goals and offer our extensive history and experience with the relevant issues. It was immediately clear that in order to create some real change, regulatory and legislative entities needed to be part of these discussions. This led to the formation of the Monponsett Working Group, an informal group of entities with interests or responsibilities connected to the Ponds. This has included: MWA, JRWA, Halifax, Hanson, DEP, DPH, DER, DFW, Cranberry Experimental Station, Mass Audubon, and other stakeholders. JRWA has remained active in this working group since its inception.

Central Plymouth County Water District Commission and Advisory Board

Discussions of the Monponsett Working Group have been productive, but are limited by a lack of authority. Late in 2013, this was addressed with the rejuvenation of the Central Plymouth County Water District Advisory Board, and appointment of the Commission early in 2014. CPCWDC and its associated Advisory Board were initially established by the Legislative Acts of 1964 that augmented Brockton's supply in Silver Lake by allowing the diversions. The Board is comprised of all of the municipalities that are impacted by Brockton's water use: Halifax, Hanson, Kingston, Plympton, East Bridgewater, Pembroke, Whitman and Brockton. That Board fizzled over time and became completely non-existent for several decades. In 2013 towns began appointing members to the Board. Although not all of the members have been appointed yet (including Brockton) the Board and Commission have been moving forward on their mission. A highlight of 2014 was the

Commission's order that Brockton stop diverting water from Monponsett to Silver Lake until cyanobacteria levels are below harmful levels as determined by the MA Department of Public Health.

Water Evaluation and Planning Model (WEAP)



The Forge Pond Fish Passage Feasibility Study conducted by Gomez and Sullivan indicated that

Brockton's current water manipulations would not allow adequate flow for outmigration of herring in the fall. The report included a cursory analysis of the options available and the potential to secure adequate flow through changes in water management. The conclusion was that it might be possible, but that there is a high level of complexity and unknowns that reduce confidence. With this conclusion we have found it difficult to move forward on the Forge Pond Dam project. Availability and timing of water is the critical piece needed to make this project successful. In 2014, the Division of Ecological Restoration (DER) stepped in to help address this key question. DER hired a consultant to develop a number of scenarios using the Water Evaluation and Planning (WEAP) model – a software tool that takes an integrated approach to water resources planning. The consultant set up and calibrated the WEAP model that allows JRWA and DER to adjust water management scenarios and predict the outcome in terms of available water. This is of *HUGE* value to us and enhances our ability to credibly propose changes to the current management regime. DER is continuing to help us refine the model in 2015.

Forge Pond Dam and Lake Street Culvert

While we use the WEAP model to address the water availability and flow concerns, there is also a lot of physical work we can move forward on to improve fish passage. JRWA has been working closely with the Division of Marine Fisheries (DMF) to plan for the installation of a fish ladder. We hope to install a fish ladder in the very short term (1-2 years) to address the immediate needs of Jones River herring. This would be a stopgap that provides improvement while leading to an eventual full restoration at the site. JRWA believes that doing nothing while waiting for full dam removal would take too long, and compromise the chances for the fish to survive at all. In 2014, JRWA, DER, and DMF worked to develop a presentation for the Brockton Water Commission (BWC) regarding the proposed fish ladder. In December, Brad Chase of DMF presented fish ladder design plans to the BWC and asked that they approve the development of a formal Memorandum of Understanding (MOU). The Water Commission unanimously approved that effort; and we move into 2015 developing final designs for the ladder, beginning the permitting process, and working out details of the MOU.

Just downstream of Forge Pond Dam, the river runs under Lake Street in Kingston. The culvert under the street was identified as a potential barrier to fish passage under some flow conditions. This is something we can address independently of work at the dam. In 2014, JRWA wrote several proposals to design a new culvert and began discussion with the Town of Kingston, which owns Lake Street and the culvert. We will be notified of funding in 2015 and will continue to pursue the culvert upgrade in parallel with all other efforts at the dam.

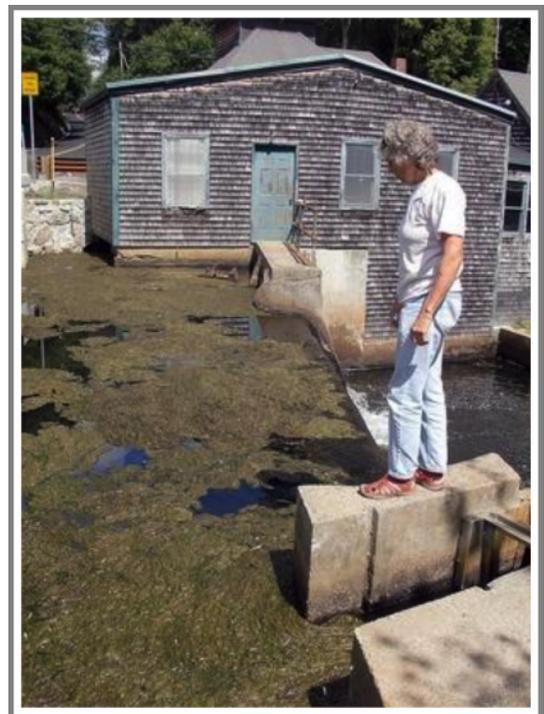


Elm Street Dam

August 2013 drawdown – Google Earth

The Town of Kingston owns the Elm Street Dam and it's falling apart. This means the town has to make some choices, and there are really only two: 1) Repair and maintain the dam at significant cost forever, or 2) Remove the dam and all of its long term costs, liabilities, and impacts. We prefer option #2 for ecological reasons. If you live Kingston, you probably also prefer option #2, since the costs implications are so much better. We urge you to spread the word on this. Bring it up around town, mention it in your other groups, make it coffee talk. If you know someone who's concerned about how it would look, invite them to check out the former Wapping Road Dam site. If you're puzzled by the process, give us a call and check out the new study that's available. It should be released to the town very soon.

Following Kathryn Gallerani's article in the Kingston Reporter on September 5, 2014, where Pine discussed the hazards and conditions at Elm Street, Beth Lambert of MA DER gave a presentation to Kingston Selectmen about dams, dam ownership, and benefits of dam removal. (DER considers removal of the Elm Street Dam to be one of the best potential environmental improvement projects in Massachusetts.) Following that meeting, the BOS formally requested that DER conduct a reconnaissance survey to evaluate the potential for



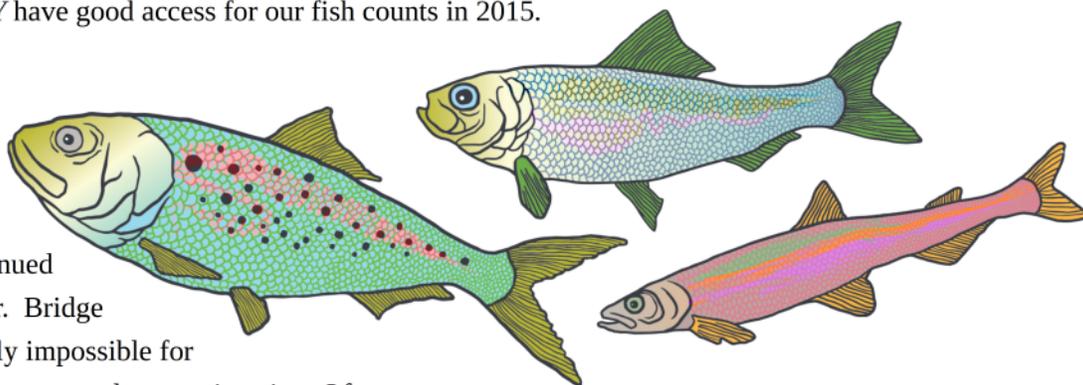
dam removal. DER approved this request and hired the engineering firm Stantec Consulting Services Inc. to conduct the survey. The survey was completed in October 2014 and the report is anticipated in early 2015. This report will be invaluable for helping the town understand how to move forward.

In 2014, the Elm Street bridge construction was finally finished (~1.5 years behind schedule). There were a lot of issues with the construction – many huge opportunities missed, including removal of the dam – but those things can't be changed now. There were some benefits of the construction:

- Multiple drawdowns of the impoundment let everyone see the nice distinct channel that exists through the otherwise swampy 'pond.'
- The bridge was designed such that removal of the dam would not impact the bridge structure.
- We will *FINALLY* have good access for our fish counts in 2015.

Fish Count

The Jones River Fish Count at Elm Street continued to be a challenge this year. Bridge construction made it nearly impossible for



our dedicated volunteers to access the counting site. Of course our

volunteers are a persistent and hardy bunch, so we did in fact successfully complete the count and generate the needed data, even if it wasn't as complete as previous years. Please participate in 2015, we promise it will be much easier!

Knowing that we would be facing these access issues, we decided to deploy an underwater video camera in the river. With the cooperation of the Kingston Water Department that housed our equipment, this camera recorded around the clock throughout the fish run. We had several goals with this camera: (1) to have data to fall back on in case we couldn't conduct our volunteer count, (2) to compare video methods to the volunteer method, and (3) to look at night-time activity. This is how those played out:

- **The volunteer count was a little light due to the access problems, so we took a hybrid approach with the data.** All of the volunteer data was first collated so that we could determine coverage and identify data gaps. We then used the video data to fill in all of the gaps. Both video and volunteer data were analyzed exactly the same way (i.e. 10-minute counts randomly timed within three larger time blocks throughout the day). This hybrid approach gave us 100% coverage throughout the course of the fish run.
- **We analyzed the data in several ways: (a) only volunteer data, (b) only video data, and (c) all data combined.** We found that each of the data sets resulted in nearly identical estimates of the run size. The benefit of using the combined data is that it greatly improved the statistical certainty of the final estimate. The final result for the 2014 fish count was 5,121 herring (+/- 1,134). This is the highest estimate that we have had since starting the count in 2005. While it is only a touch higher than 2013

(insignificantly so) and is far below what it should be, we still consider this a positive sign. We are confident that our restoration and protection work will continue to pay off.



- **“Do fish run more during the night than the day?”** This has always been a question and concern for daytime-based visual counting methods. Fish may respond differently to water temperature, visibility, threat of predation, etc. at different times of day. Using the video data we did some cursory evaluations of this. We found that the dawn and dusk hours appear to have the highest fish activity, with more fish coming up the ladder during these times than at any other. This means that peak activity is probably missed by the 7am to 7pm visual protocol. This is something we have raised with the Division of Marine Fisheries out of concern for under-reporting of run size. Their response has been one that we respect and agree with: the visual count method is best used to look at long-term trends within a run and at regional comparisons between runs. Therefore, a consistent approach and the relative trends are more important than the specific number that might be affected by things like day/night differences. Sticking with daytime-only counts is the best way to be consistent across the years and regional runs.



- **One benefit of the video system was one that we hadn't planned on – catching the unexpected!** Running the camera 24/7 and using motion detection software to highlight activity, we were able to document some pretty cool stuff! We even happened to catch the bridge construction crew dumping mulch in the river. This led to clean-up and containment of more mulch. *Pictured – lots of herring (top left), large mouth bass trying to eat our herring (top right); river otter (bottom left), trout (bottom right)*

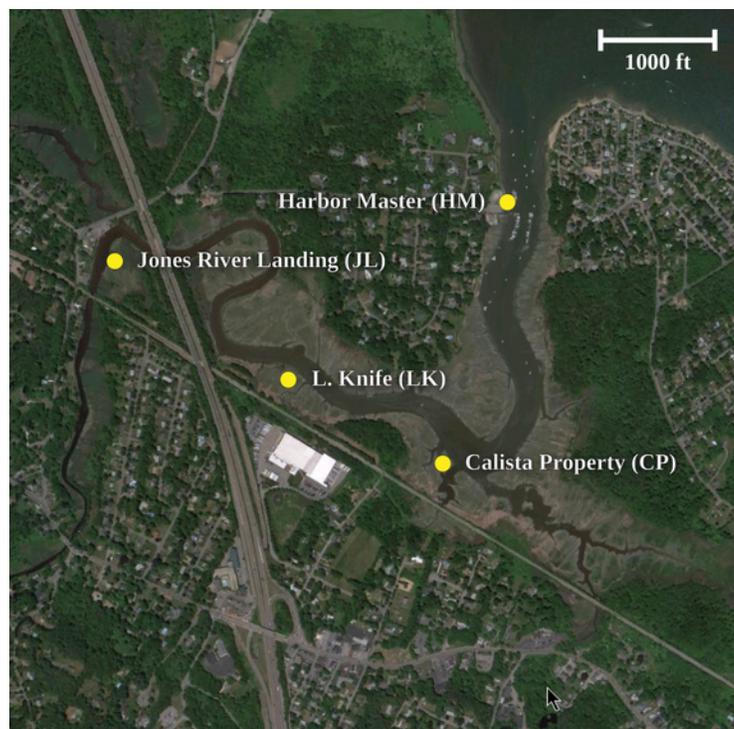
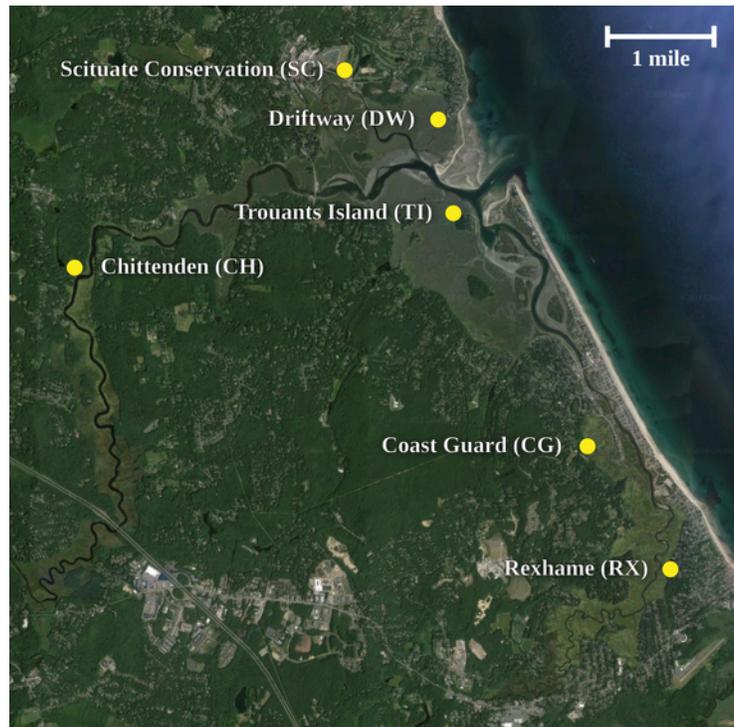
Salt Marsh Monitoring

Pictured – Monitoring sites at North and South Rivers and Jones River

In 2014, we also had a chance to work down in the salty part of the river. Early in the year we were awarded funding by the Massachusetts Bays Program to initiate a salt marsh monitoring program. This project is focused on combining traditional monitoring techniques with new technologies to address salt marsh health. A highlight of the project was the opportunity for collaboration. JRWA took a lead role in working with a fantastic group that included North and South Rivers Watershed Association, MIT Seagrant, University of Massachusetts, Boston (Consortium for Ocean Sensing in the Nearshore Environment, COSINE), and others.

Using a system in development by collaborators at UMass and BU, we installed remote sensing nodes consisting of cameras that send high quality images of the marsh via radio antennas, powered by solar photovoltaic panels. We are developing protocols that use these cameras to monitor (1) tide height and any excursions from predictions or historical patterns; (2) chronic or acute events of erosion, slumping, or subsidence; and (3) any biological activity which might affect marsh geology, such as crab density and behavior and plant growth and senescence.

We also conducted traditional physical surveys to measure parameters which may be linked to marsh subsidence and inundation using methods developed by, and consistent with, other long-term marsh monitoring programs, including re-visiting sites on the North River that were established more than a decade ago. These parameters include biomass and vegetation surveys using traditional transect methods. In addition to providing information that cannot be captured by camera, the on-the-ground surveys served to ground-truth the data generated by the cameras and provide background to assess their efficacy in assessing physical change.





The summer of 2014 was spent trampling through the salt marshes of the Jones River, North River and South River sampling a total of ten different sites (*mapped on previous page*). The sampling team consisted of two-time JRWA intern Amy Meloski, new interns Victoria Hughes and Michael McMahon (*pictured above*), NSRWA Ecologist Dr. Sara Grady, and JRWA Ecologist Alex Mansfield.

The results of the physical sampling, and the new marsh camera protocols will be available in a report completed in early 2015. Early review of the data shows some very interesting changes in the North and South Rivers that have occurred since they were last sampled in 2001.

Jones River Ecology: Reaching Out

The Tri-Basin Initiative described above refreshed JRWA's activity beyond our watershed boundaries. In addition, we frequently connect with other groups in order to learn from them and share our experiences.

River Herring Network

JRWA is an active member of the River Herring Network. This group has existed in the minds of many folks for many years. Following a summit at Jones River Landing, it got its formal start in January of 2011 with the award of a grant from the Massachusetts Bays Program to the Cape Cod Commercial Hook Fishermen's Association. The three main goals of the Network are to:

- Facilitate communication among herring wardens and other river herring enthusiasts.
- Support herring wardens in their role as active participants in fisheries management processes.
- Document and communicate the natural and cultural history of the herring runs.

The ultimate goal is to do work that will increase the numbers of alewife and blueback herring in the waters of Massachusetts. In 2015, JRWA's Alex Mansfield will serve on the Steering Committee helping to guide the mission and success of this young network.

Naturalist Workshop

Every April, a program is offered in partnership between the Dolphin Fleet of Provincetown, the Provincetown Center for Coastal Studies, and Whale and Dolphin Conservation to address issues relative to Marine Mammals in Cape Cod Bay. The Workshop typically invites guest speakers to discuss other issues in the Bay. At the 2014 meeting (*pictured*), Alex Mansfield of JRWA presented River Herring status, threats, and outlook in Cape Cod Bay and beyond.



Lecture Series: Climate Change in Your Backyard

In the winter of 2013-2014, JRWA partnered with NSRWA and hosted a public seminar series titled, Climate Change in Your Backyard. The goal of this series was to provide residents of coastal communities an educational forum in plain language about preparedness and options in light of local climate change impacts. Turnout for these lectures was terrific and the discussion was productive. Lectures included:

- Andre Martecchini, Kleinfelder Assoc. – *“Sea Level Rise Projections for the South Shore”*
- Juliet Simpson, MIT Sea Grant – *“Climate Change and Storm Preparedness”*
- Rebecca Haney, MA CZM – *“Techniques for Reducing Coastal Erosion and Storm Damage by Enhancing Natural Landforms”*
- David Ray, Nantasket Survey Engineering – *“The Process and Benefits of Elevating Your Home”*
- Eric Walberg, Manomet Center for Conservation Sciences – *“Climate Change Impacts on Ecosystem Services and Approaches to Adaptation”*
- Marci Coke Ekberg – *“Vulnerability of Salt Marshes to Sea Level”*



Cape Cod Bay Watch Program



Beginning in January 2014, Cape Cod Bay Watch (CCBW) officially became an operating program of JRWA. While our focus is now on Pilgrim Nuclear Power Station, our long-term goal for the program is to further protection of the species and health of the Cape Cod Bay ecosystem, and increase available information about the Bay and its resources.

We became involved because of Pilgrim’s substantial destruction of rainbow smelt and river herring from the Jones River. We learned later that this facility is one of the most significant threats to the Bay’s natural resources due to the impingement and entrainment of more than 100 aquatic species by the cooling water intake process, the warming of the Bay due to the discharge of heated wastewater, and the introduction of an assortment of industrial pollutants due to its operations. We are deeply concerned about the lack of oversight at this facility, and the real potential for an accident that could prove disastrous for life as we know it in Southeastern Massachusetts. Pilgrim’s age, proximity to sea level, and legacy of radioactive waste are all cause for serious concern. The following outlines our progress on a number of these issues:

Nuclear Waste Storage on Cape Cod Bay

CCBW continued to assist with the Land Court case concerning Pilgrim Nuclear Power Station’s “dry cask” nuclear waste storage project and violations of local zoning regulations. Entergy, Pilgrim’s owner, is preparing to store highly toxic nuclear waste for perhaps hundreds of years, within a couple hundred feet from the shore of Cape Cod Bay, and near sea level. Pilgrim began construction in 2012 and the Plymouth Building Inspector issued a simple building permit, rather than a special zoning permit, for the

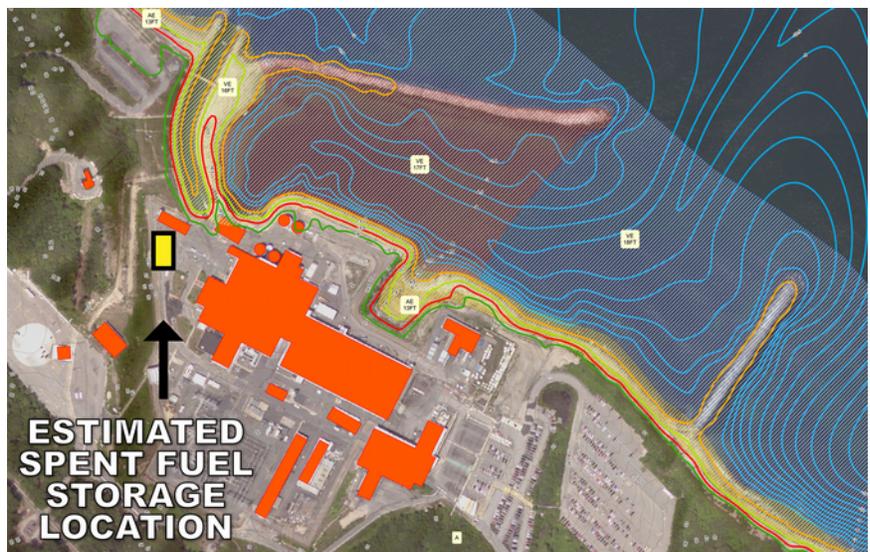
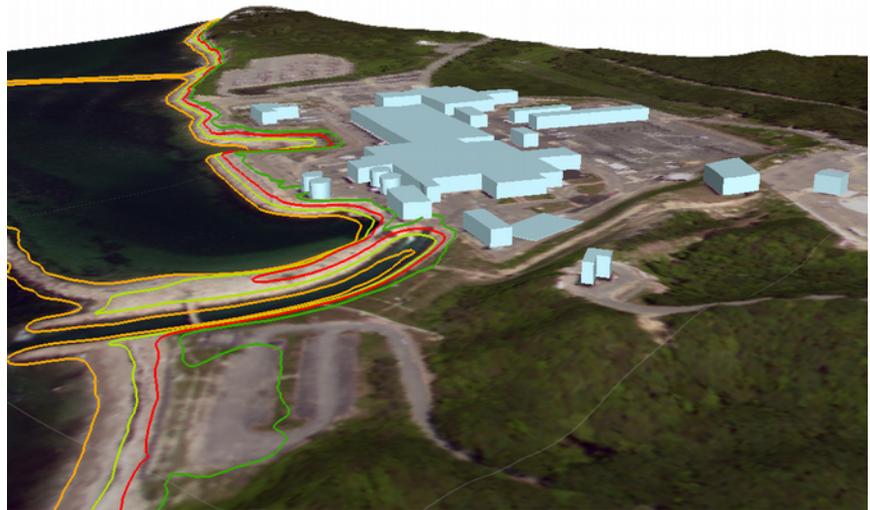


massive “Independent Spent Fuel Storage Installation” (ISFSI). Without a special permit, the project will receive no formal scrutiny, and no evaluation of the risks for adverse and potentially catastrophic environmental effects. Alternatives will also not be evaluated, which is typically required for large-scale projects. One estimate by Entergy, Pilgrim’s owner, puts the cost of this project at \$65 million. A lawsuit was filed in 2013 by a group of citizens appealing the Zoning Board’s decision to not require a special permit. Entergy is representing the Town of Plymouth in the case. In August, the citizen plaintiffs scored a major victory when the court rejected Entergy’s attempt to get the appeal thrown out. The judge ruled that plaintiffs living within two miles of Pilgrim have standing to move on to the next stage of the case due to potential loss of property value caused by the proximity of the massive nuclear waste storage project.

The case will likely go to trial in 2015. Plaintiffs seek a remand of the case to the Plymouth Zoning Board to require a special permit that includes environmental design conditions, consideration of alternatives, and mitigation measures. This is to ensure that the storage of nuclear waste at Pilgrim is properly addressed and results in the safest and most environmentally protective project possible – after all, we, the public, will ultimately own this problem!

Climate Change Awareness

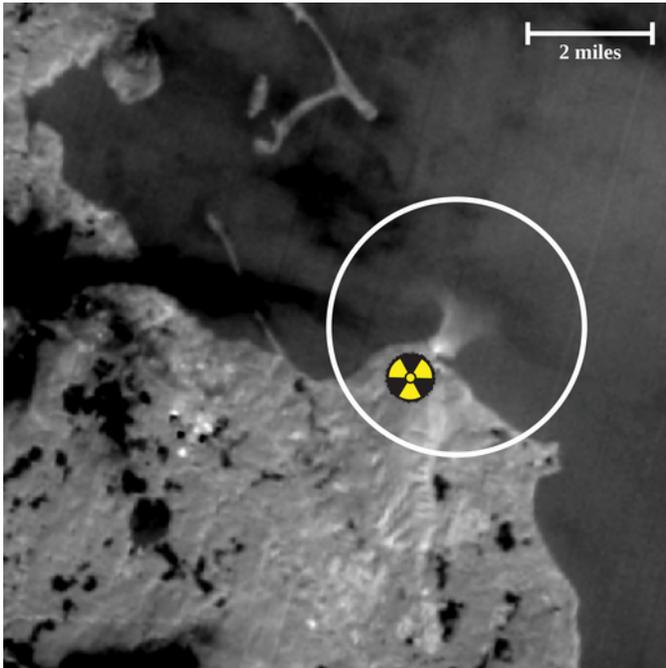
CCBW expanded efforts to relate the risks of climate change patterns (e.g., sea level rise, stronger storms, flooding) to Pilgrim’s daily operations and nuclear waste storage areas. Entergy’s site maps and commentary on Pilgrim present outdated and mixed elevation datum, and paint an inaccurate picture of the facility’s relation to Cape Cod Bay. To address this, we began working to produce two- and three-dimensional maps to demonstrate Pilgrim’s vulnerabilities, based on current publically available information. Our hope is that these maps will lead regulators to require an updated, thorough, on-site survey making it possible to accurately assess Pilgrim’s flooding risk. We also provided input to state and federal agencies on their energy policies aimed at reducing carbon emissions to ensure that nuclear power is not included as a clean energy source in these plans.



Looking ahead, we expect to launch an educational campaign using our new maps to raise public awareness so that elected officials and regulators will require Entergy to produce accurate site information and develop useful emergency response plans, at the very least. This will help protect our communities and environment and hopefully minimize accidents related to storm events and other climate change patterns.

Permit to Pollute the Bay

Pilgrim's thermal pollution can be seen from space – USGS/NASA Landsat Program



Under the federal Clean Water Act (CWA), Pilgrim is required to have a “National Pollutant Discharge Elimination System” (NPDES) permit to regulate its discharge of pollutants and intake of water from Cape Cod Bay to cool equipment. Pilgrim’s NPDES permit expired in 1996. CCBW continued its efforts to pressure the U.S. Environmental Protection Agency (EPA) to issue an updated permit requiring “the best available technology” be used, as required by the CWA. We seek to reduce pollution and the number of fish and other marine organisms killed in the cooling water intake process. Pilgrim presently uses up to 500 million gallons of water every day, killing more than 120 species. The heated water is then discharged back to the bay, essentially wasting two-thirds of the energy produced. EPA finally ramped up the

process this past summer, and has asked Entergy for information on the feasibility of implementing alternative technologies such as a “closed loop system” as well as others. As a result of a new federal rule adopted this past June, EPA is currently consulting with the U.S. NRC regarding Entergy’s response.

As we continue to push for Pilgrim’s NPDES permit to be updated in 2015, we will rely on significant involvement from all who are concerned about Cape Cod Bay, to support a permit that requires protection of this essential natural resource.

Groundwater Pollution

We continued to monitor reports of pollution from Pilgrim affecting groundwater and the Plymouth-Carver Sole Source Aquifer, since groundwater on the site is mapped by USGS as flowing toward Cape Cod Bay. Early in 2014, we learned that excessive levels of radioactive tritium were found in groundwater samples near the reactor. Additionally, Pilgrim’s industrial wastewater treatment facility was found to be discharging high levels of nitrogen and other pollutants into the groundwater via a leaching field on Rocky Hill Road. In 2015, CCBW will continue to bring attention to these issues and pressure MA Department of Public Health and MA Department of Environmental Protection (DEP) to take enforcement actions and require Entergy to abate the pollution and improve conditions in the local groundwater and Cape Cod Bay.



Tidelands Infringement

In May 2014, Entergy applied to the Army Corps of Engineers, Plymouth Conservation Commission, and DEP for a “Chapter 91 Permit” to use public tidelands along the shoreline in front of Pilgrim for an emergency cooling system to meet the requirements of the NRC to have backup emergency cooling water. Entergy plans to install two buoys to anchor an outhaul system, which will be used for deploying a fire hose into the Bay. The hose will be connected to a portable pump at the mean high water line. Entergy claims this equipment will help cool the reactor and spent fuel pool and prevent a meltdown in the event of an unplanned power loss affecting cooling water operations. Cape Cod Bay Watch has asked that DEP not grant the permit for this project because we are concerned that the system will fail during any significant storm event, as well as likely discharge radioactively-contaminated water into the Bay. A workable plan is needed to address emergencies.

CCBW worked with others to request DEP to hold a public hearing that would allow greater awareness of the project. DEP granted the hearing on November 18th and more than 80 residents attended – many providing powerful testimony to DEP. DEP will issue their decision in early 2015. Since the hearing, CCBW also submitted a request under the MA Environmental Policy Act (MEPA) for “Fail-Safe” review by the Executive Office of Energy and Environmental Affairs. Although MEPA was “sensitive” to our concerns, the Secretary felt that the state lacked the authority to review the issue, stated in a letter dated January 8, 2015.

What's cooking at Entergy? It sure does smell like



A Recipe for Disaster

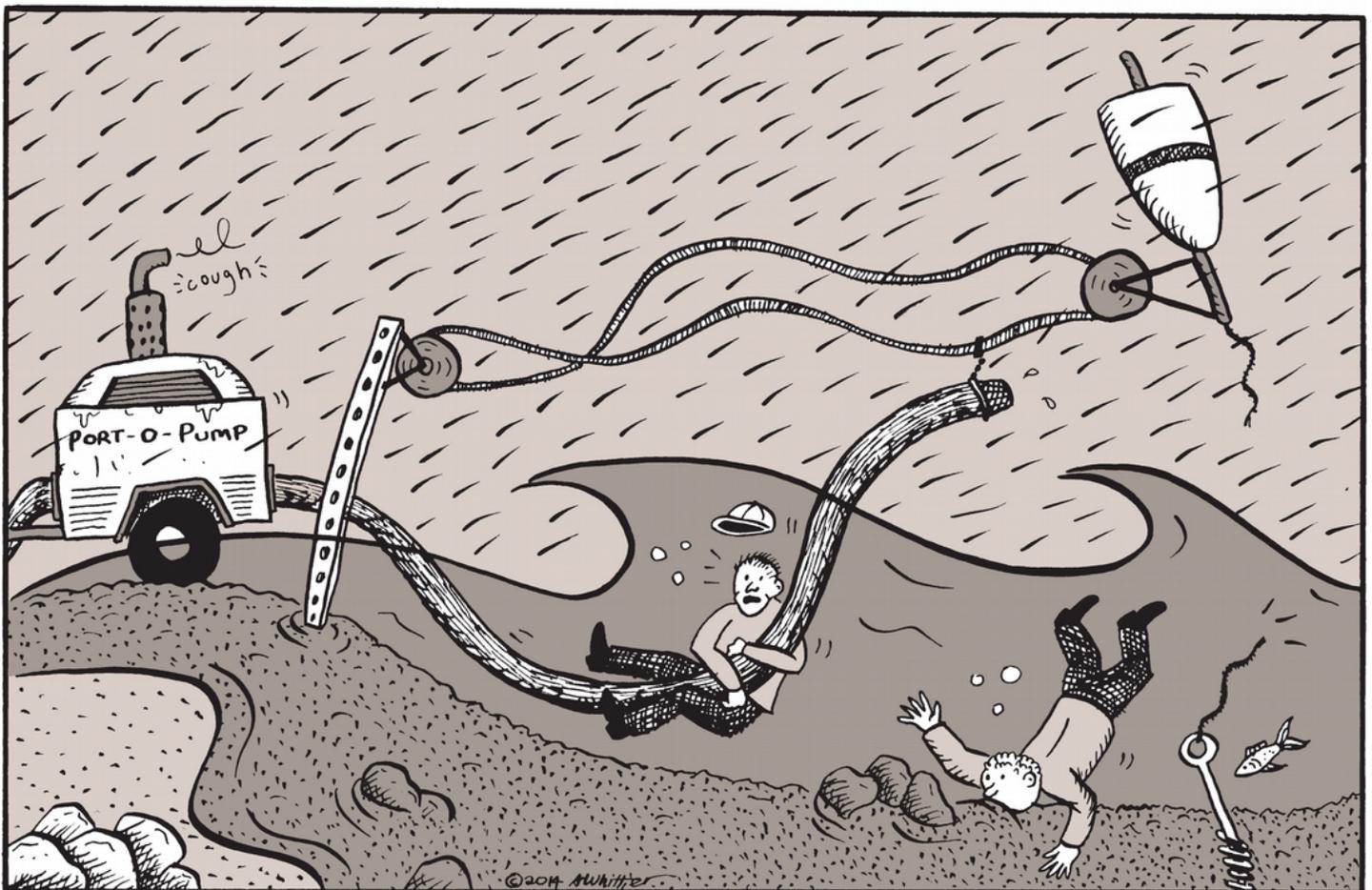
Ingredients

1 cup gullibility
3 cups shortsightedness
4 oz. pennies, pinched
1 cable
2 pulleys
1 hare-brained utility
An awful lot of seawater

Instructions

Mix all ingredients together on public trust land, by the Bay.
Be sure to have plenty of grease on hand for bothersome officials.
Bake at 350°F for as long as it takes to get regulators to go away.
Serve to an unsuspecting public.

Tastes good, and good for you! Below is an image of the dish, half-baked:



Public Education Efforts

It has been another productive year for CCBW's education efforts. For the second year in a row, Cape Cod Bay Watch hosted a workshop at the MA Marine Educators 31st Annual High School Marine Science Symposium, in which the environmental harms of Pilgrim's cooling system was the focus. Nearly 400 visitors stopped by the CCBW office in downtown Plymouth to learn about our work. In addition to many volunteers, two interns from UMass Boston and Lesley College helped with program work this year.



CCBW also participated in Pine Fest, the Herring Run Festival, Cape Cod Wildlife Festival, Kingston's Community Expo, and several other events. The Public Laboratory for Open Technology and Science held a portion of its northeast regional conference at the Jones River Landing in June. The conference focused on local water quality issues, such as impacts from Pilgrim. Participants from Oregon, Louisiana, Rhode Island, Vermont, Connecticut, New York, Boston and Western Massachusetts engaged in research and tool development around the issue.



Our efforts to educate local and regional communities about the ecological harms caused to Cape Cod Bay will continue in 2015. CCBW plans to release a comprehensive report on Pilgrim early this year, to provide a wide range of information on Pilgrim to legislators, regulators, and the public. We are also already gearing up for two presentations this spring: the Northeast Naturalist Conference in Provincetown (with attendees from Canada to the mid-Atlantic) and Toxics Action Center's Local Environmental Action Conference at Northeastern University.

Pictured – Herring Run Festival at Plimoth Plantation, April 2014 (top), Public Lab Barnraising at the Landing, June 2014 (left), Cape Cod Wildlife Festival, September 2014 (right)

Information on the wide range of issues we address, letters, legal briefs, decisions, news and a forum can be accessed at www.capecodbaywatch.org. Please sign up for the newsletter to hear about current events.

Jones River Landing



The progress at the Landing this year centered on improving conditions inside the boatshop to address perennial floods (*pictured*) and protect tools, setting the restored Shiverick Duxbury Duck to “Wing”, and completing the reconstruction of the Holmes boatshed on the land up the river so that we could properly house our growing fleet of small wooden boats. We tried and failed to get funding to restore the dock and improve the boat ramp – but we will not give up! At least the dock has been secured to land with cables and blocks for the interim (*pictured*), while it awaits additional inventive efforts by the volunteer crew. We continue to discuss a crowd-sourcing project to raise needed funds. It is not that we do not recognize the need for improvements – indeed we have gotten required permits – it is just that we are taken up with other demands.



Mass Bay Maritime Artisans

There is something satisfying about being out on the water in a wooden boat. Add the camaraderie of a group of people who have worked together with a common goal for a long period of time, and you have the makings of a milestone event.

In 2014, that milestone event for the boatshop was the sailing of *Merrywing*, the 18' Duxbury Duck that last saw the water decades ago. On a beautiful October day, the volunteer crew from the boatshop trailered the boat to the mouth of the Jones River, rigged and launched the fully restored day sailor into her home waters once again. For a few months prior to this launch, during the Wednesday evening volunteer hours in the shop, the crew carefully reassembled the spars and rigging for the boat. During the 7-year restoration of the hull, the various components of the rigging, mast, boom, shrouds and stays were individually repaired or replaced.

It was now time to test whether all these parts would fit together as designed and function properly. It is not telling tales out of school to say that there were several unexpected irregularities that had to be addressed. In the weeks leading up to the launch, we lost track of the number of times the 20' mast was raised and lowered during this phase. The length of the shrouds, the wires that supports the mast on each side, had to be adjusted. The mast, and the step into which it stands, needed to be brought into alignment. Minor problems of jib sheet

fairlead location and clew outhaul configuration needed to be discussed and finalized. Then there were the sails.

We had a bag containing two sails, a mainsail and a jib – both of which, with a casual inspection, appeared to belong to *Merrywing*. It wasn't until the crew stepped the mast and started test fitting the sails, a few weeks before our scheduled sailing date, that it became clear this was not the suit of sails for the Duck. A search in the loft provided any number of sails, none of which belonged to the boat.



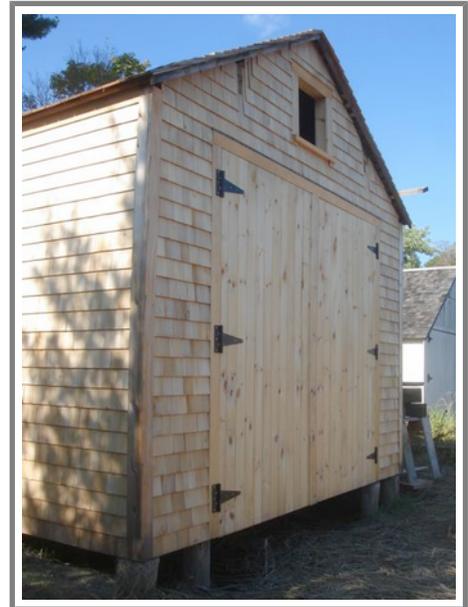
Calculations of the time to sew a new sail or the cost to have one made didn't provide a ready answer. It was not until Alan, one of the volunteer crew, started clearing space in the back shed for another project that he came across a bag marked "Mainsail, *Merrywing*." There were two old, soft sails in the bag, one bigger than the other, but one would clearly work for the maiden voyage as long as it wasn't too windy to over-stress the worn cloth.



October 25th is late in the year to start a sailing season, but with the feeling of both, "better late than never" and "if not now, when?" *Merrywing* was trailed to the Kingston town boat ramp. The small crew, representative of the 70 or so people who worked on the boat over the course of the full restoration, stepped the mast, adjusted the shrouds and stays and bent the newly found mainsail onto the spars. Right away there was a problem. A test raising showed the sail did not in fact fit the boat at all. The short sail reached only about two thirds of the way up the mast. Fortunately, it is a short trip back to the shop to retrieve the right sail out of the found sailbag.

It might be cliché to say the sail that day made all the effort worth it but that is in fact true. The weather couldn't have been better. The blue sky and warm sun made the late October day feel more like summer. The wind was strong enough to move the boat well, but not

too strong to over-stress the fragile sails. The boat itself, in a true testament to the care that went into the restoration, never took on an appreciable amount of water. From the chase boat, an 18' outboard motorboat brought along by Matt Murray, the volunteer crew could move from one boat to the other on the water, taking turns steering *Merrywing*, or admiring the boat as it flew along the waters of Kingston Bay.



Merrywing is now stowed away in her new winter home – the Holmes boatshed (pictured) – just up the river from the Landing and next to the Watson shed, which was restored a few years ago. 2014 also saw the completion of the Holmes building restoration, which was completely rebuilt by MLB Restoration, a company specializing in saving historic buildings.

The crew from MLB raised the building about 18” off the marsh, installed locust posts, replaced some sheathing, re-sided, and put a new red cedar shingle roof on the structure. They fitted a white oak floor to accommodate the winter storage of boats like *Merrywing*.



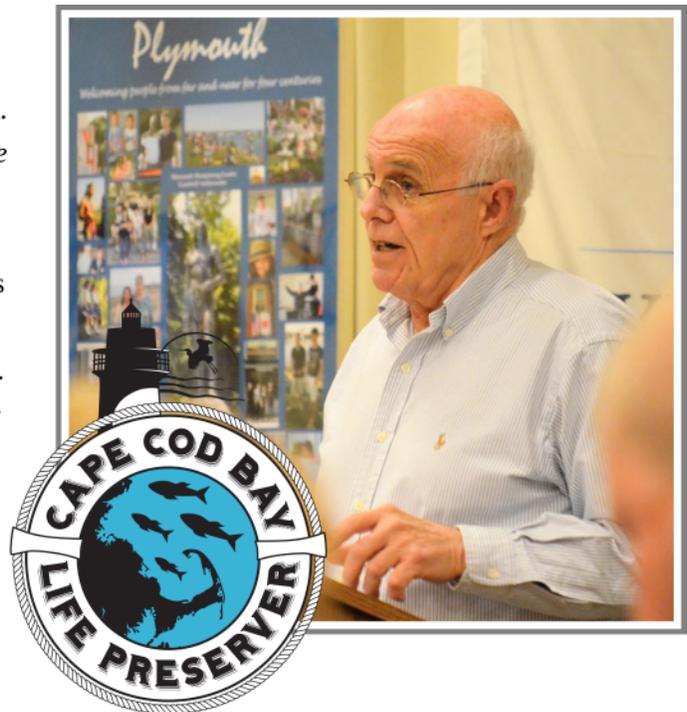
The Shiverick boatshop received a new floor this year as well (pictured). With the advice and aid of commercial carpenter Rob Quick and mason John Millet, the volunteer crew poured a series of concrete piers on the old floor on which a new wooden floor could be built. The single layer of white pine boards makes the shop more comfortable to work on and easier to heat. Upgrades to the electrical system, new fixed work benches and general organization of the space will all help get the boat building project for 2015 and beyond off to a great start.

Acknowledgements

Our Mission in Jones River Watershed continues into its 30th year – because it is important, and because our members and friends continue to contribute time, energy, and money; and do what is necessary to move our plans forward. The river is improved today over conditions three decades ago – but it is not where it needs to be. It is improved this year, more than last year – and we are determined that next year it will be better still!

The Jones has friends in government too, both on the state and federal level. They represent our interests and help find money for necessary projects, like dam removal and better water management. Very importantly, we have dedicated friends in Foundations that continue to find ways to fund our work year after year, even as their own budgets strain. Without all of this help those of us who work within the organization would not be able to continue. It is this generosity – from membership contributions to the hundreds of thousands some have given us – that make the difference to the river, the regional environment and our lives today and tomorrow.

The Boards of Directors that guide the work in the watershed and at the Landing, and the staff that carry out the work are listed in the early pages of this report. In addition, we must acknowledge our *River Rat of the Year*, Bob Weber, whose incessant generosity, participation on the Board as its Secretary, consistent effort counting fish (or no fish) year after year, and his regular efforts to stimulate our social gatherings with inspiring taste treats powers our volunteer community. Great thanks are due to Bob, as well as the 2014 *Cape Cod Bay Watch Life Preserver*, Bill Maurer (pictured), who does more legwork than any could imagine, including reaching out to neighbors, fishing out plans and papers from town hall, as well as participating in preparations to advance the information on Pilgrim Power Station, at home and in Boston. These men are our torchbearers this year.



In addition, we extend deep gratitude and have considerable admiration for our pro-bono legal team for their untiring outreach, investigation and pursuit of justice that focuses awareness on issues of public and environmental concern. Through their efforts, we dig into the law to urge government regulators and the people at Entergy Nuclear Operations to be accountable. We thank the many area residents who have participated in comments, filed legal complaints, and got the word out on the deficiencies at Pilgrim Station that endangers the region every day. These teams include our friends at CCBW, the unrelenting actions of the Cape Downwinders, the Concerned Neighbors of Pilgrim, Pilgrim Watch, and the Pilgrim Coalition. We are very grateful to the legislators that see the problem for what it is and help in significant ways to raise the issues at the state and federal level. We are deeply grateful for the financial support of the Civil Society Institute, the Island Foundation, and anonymous donors that make our Cape Cod Bay Watch Program possible.

When it comes to work in and for the river, our deep thanks extend to the amazing team at the Division of Ecological Restoration (*River Rats* of 2012!), because of their significant commitment to the Jones and all of the Tri-Basin's natural resources. They consistently bring new tools to the table and help with the most difficult problems. Thanks also for the consistent help of *Marine Fisheries* at Forge Pond Dam where we are moving incrementally forward toward removing obstacles to fish migration to Silver Lake. We are enormously grateful to the people who have stepped forward to help solve the regional water supply management crisis – Conservation, Highway and Administrator in the Town of Kingston, the Monponsett Pond Watershed Association and Working Group, our legislative delegation that support our efforts to overcome a hundred years of poor water management, and all the volunteers in the three watersheds that take water quality samples, monitor the fish runs and address misguided policies on so many levels. These continue to be our river heroes, because without them, we would not succeed.

We thank the Office of Coastal Zone Management and the team at North and South Rivers who worked with us to establish the Salt Marsh Monitoring effort in the Jones River estuary, and also everyone who participated in the Climate Series workshop – another joint effort. We appreciate L. Knife & Son for their strategic help with the salt marsh camera internet connection, as well as the Kingston Harbormaster for housing one of our cameras. Although not mentioned in the report, we continue to work with all of the regional watershed groups and local towns to improve the regional environment for migrating and native fish especially. We work routinely with the members of the Watershed Action Alliance of Southeastern MA, and we benefit from the work of the MA Rivers Alliance that has the drudgiest of jobs in tracking and changing state policy on water supply management.

Always, we owe great thanks to the Sheehan Family Foundation for its consistent support of our Jones River restoration efforts, and especially this year, our Tri-Basin Initiative. SFF has consistently supported our efforts since about 1991, and has sponsored many projects on the river including stormwater improvements at Elm St., Marsh Rd. and Wapping Rd.; and many land acquisitions in the region including Calista Farm, in the estuary.

Finally, we thank our friends who come up with donations to support Jones River Landing, because now it means we can support Peter Arenstam in some consistent work to develop the MBMA program. So far this program has been progressing only with volunteer efforts and the great team at the boatshop that finds the energy to make needed improvements (like the new floor!). We expect to make more progress this year, as many significant changes are in the wind! We hope you will come lend a hand, and be part of the progress to develop and maintain this center for environmental heritage and stewardship!

Image Credits

All others attributed to JRWA staff unless noted otherwise on respective pages.

Adam Whittier – Comics, “Bay Watch” (p. 16), “A Recipe for Disaster” (p. 20)

Andrea Kalajian – Painting, “Plymouth: Reclaim Cape Cod Bay! Decommission Pilgrim Nuclear” (p. 19)

Jimmy Powell – Egret in flight (cover), cormorant (p. 5), egret on Jones River marsh (p. 15)

Kathryn Gallerani, Wicked Local – Pine at Elm Street Dam, September 2014 (p. 10)

MassAudubon – Map created for our Fact Sheet on Brockton Water Supply (p. 6)

Paul Collis, Monponsett Watershed Association – Algae bloom in Monponsett Pond, 2014 (p. 8)

Plimoth Plantation – Cape Cod Bay Watch at Herring Run Festival (p. 21)

Stockholm Environment Institute – WEAP logo (p. 9)

Financial Summary

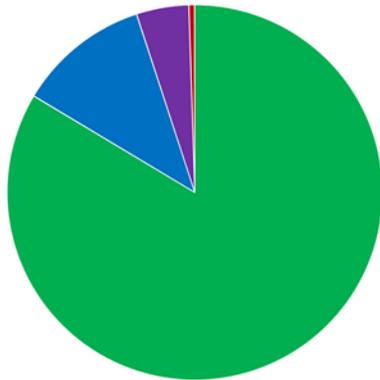
Your contributions and donations, hard at work, to preserve the Jones River and Cape Cod Bay:

Jones River Watershed Association

ORDINARY INCOME/EXPENSE

INCOME

Grants	\$ 192,238.00
Program Support	\$ 26,147.00
Memberships	\$ 10,425.00
Miscellaneous Income	\$ 855.37
T-shirt Sales	\$ 279.00
Total Income	\$ 229,944.37



EXPENSE

Fundraising	\$ 1,254.99
Administration	\$ 48,482.04
Ecology Programs	\$ 153,509.95
Total Expense	\$ 203,246.98

Net Ordinary Income \$ 26,697.39

OTHER INCOME/EXPENSE

OTHER INCOME

Interest Income	\$ 52.66
Total Other Income	\$ 52.66

Net Other Income \$ 52.66

NET INCOME (JRWA) \$ 26,750.05

Jones River Landing

ORDINARY INCOME/EXPENSE

INCOME

Donations	\$ 6,545.00
Paper Recycling	\$ 13.22
River Store	\$ 205.00
Contributions Income	\$ 525.00
Memberships	\$ 3,613.29
Programs	\$ 210.00
Total Income	\$ 11,111.51

EXPENSE

Art Aquisition	\$ 330.00
Event Expense	\$ 56.63
Licenses and Permits	\$ 35.00
Professional Fees	\$ 1,500.00
Program Expense	\$ 1,942.64
Repairs	\$ 1,173.10
Supplies	\$ 261.40
Telephone & DSL	\$ 113.18
Utilities	\$ 1,678.00
Total Expense	\$ 7,089.95

Net Ordinary Income \$ 4,021.56

OTHER INCOME/EXPENSE

OTHER INCOME

Interest Income	\$ 5.61
Total Income	\$ 5.61

Net Other Income \$ 5.61

NET INCOME (JRL) \$ 4,027.17