Woods & Waters

Essex Land Trust Members' Bulletin

December 2019

Dams, Fishways and River Restoration

By Steve Knauth

There are somewhere around 4,000 dams in Connecticut. Four thousand; large and small, most old and very old, few of them used for the purpose for which they were originally built. "We are one of the most densely dammed states in the country," says Steve Gephard, Supervising Fisheries Biologist with the state DEEP Fisheries Division. And, while many were used to power the colonization of the state and, later, its Industrial Revolution, their proliferation has meant major and, in many cases permanent, changes in the local ecosystem of countless streams and rivers.

These waterways are vitally important aquatic resources, providing a variety of habitat suitable for the different life stages and needs of a wide variety of aquatic organisms. "When rivers are dammed, they are no longer able to function naturally," says The Nature Conservancy's Sally Harold. "The habitats these species depend on for feeding, breeding and growth may no longer be accessible to them. Isolation from others of their species also results in a decline in the gene pool."

The Centerbrook Architects dam as it was before construction of the Wiederhold fishway

Dam Building in Connecticut

Where did all these dams come from? What are those long-term effects and what is being done to mitigate them?

It started with the European settling of North America. For the new colonists in the 17th century, one of the attractions of our area was a wealth of streams with a significant drop in elevation, says Gephard. Small dams built along these waterways provided power for basic industries; milling corn, sawing timber, manufacturing iron and making ice. "Most towns had streams with enough flow to make it worthwhile," Gephard says. "That worked well for a hundred years, into the middle 1700s."

In 1793, the Englishman Samuel Slater opened what's considered to be America's first textile mill, the Pawtucket, R.I., firm of Almy and Brown Co., using a dam he designed; the Industrial Revolution was on. Water would go a long way in powering the movement. "In our area, they were manufacturing ivory [goods] in Deep River, tools in Chester, twine in Moodus," explains Gephard. "Local industry was everywhere, and every town had a specialty."

A Nod to The Environment

People understood the impact these dams had on the local fisheries, even in the early 1800s; most obvious was the disruption of fish "runs", or migration patterns. In Maine, a primitive type of fishway was built for the alewife population; dams in many states were supposed to have a gap for migrating fish, but they were seldom built. "These dams wiped out fish run after fish run," says Gephard. "In the 1860s, they tried to restore salmon and shad to the Connecticut River by building fishways, but they didn't work very well."

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The End of Dam Building

This intensive, water-powered industry lasted through the 19th century in our part of the Valley, before tapering off. But dams were still being built for other purposes, including hydroelectric production (there was one on Salmon River in East Haddam) and industrial processing. There was a last flurry of dam-building right after World War II much of it for flood control.

What Was Left

All those years the dams were being built, they were having a deleterious effect on the waterways they were built on. They didn't just block the fish migrations, they also led to a rise in water temperature and altered the depth and breadth of the stream, impacting the lives of the plants and animals that lived there.

In short, a dam pretty much changed everything. "Natural water falls blocked anadromous fish [which move naturally between fresh-and salt-water] migrations, but the dams downstream of the falls blocked and, in many cases destroyed, the runs completely," says Gephard. Even above the range of anadromous fish, there were trout and other native fish that were affected. "The Falls River would have been full of Brook trout, which prefer swift-running water," Gephard says. "Now, the trout are farther upstream at the preserves while the ["quieter"] Mill Pond area of the river is home to Large-mouth Bass, Bluegills and non-native minnows."

A view of the Centerbrook Architects dam and one of the steeppass sections that ascend towards the dam

Restoring the Fish Runs

Today's modern fishways can help restore those fish species' migration patterns.

The new era of the fishway in New England began in the 1970s. Using technologies from the West Coast, where salmon runs were being restored, New Englanders got serious about restoring their own runs of Atlantic Salmon, Alewives and Bluebacks, says Gephard. "In Connecticut, we've built about 65 fishways through the Diadromous Fish Program of the Fisheries Division. We come to a town, look at a stream and discuss options with property owners."

The dam behind Centerbrook Architects, in Centerbrook, Connecticut, was just such a property, and removal was not an option. "A lot of people live around the pond [behind the dam] and Centerbrook Architects still uses the dam to generate electricity," says Gephard. "But there was an interest in fish restoration."

Centerbrook Architects' Principal, Mark Simon, explains why. "Our former facilities director, Bill Rutan, suggested a fishway after removing his own dam, arousing our curiosity. Shortly after, we met Sally Harold of The Nature Conservancy, and Steve Gephard of [the Connecticut] DEEP, who explained the fishway's critical ecological benefits and how we could create a partnership."

The result is the newly-constructed John T. and Jane A. Wiederhold Fishway, located on the Falls River behind Centerbrook Architects' historic building, a former manufacturing facility that used the dam for power.

"We're all very pleased with the result and eager to observe the first run

A view from the top of the dam showing the trajectory of the fishway as it ascends the 18 feet in elevation to reach the Mill Pond

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next spring," says Simon. "And we're looking forward to the DEEP's ongoing monitoring and maintenance, which makes our lives easier and offers ongoing scientific value to the project. And of course, we are proud to bring back fish that haven't been up our river for over 300 years."

That's the kind of synergy that can help restore and rejuvenate the state's waterways and the ecologies they represent. "Fish restoration projects can't happen without public/private cooperation," Simon says. "Since many dams are on private property, the participation of the landowner is necessary and yet, they are not likely to understand required steps. We found that The Nature Conservancy and the DEEP's involvement was essential to our participation: they instilled confidence and lead us through the process with ease in an informative and collaborative approach."

Anatomy of a River Restoration Project:

John T. and Jane A. Wiederhold Fishway

By Steve Knauth

The Falls River has seen its share of construction over the years. Today, it's all about fishways, or "ladders", which could go a long way in redressing the injuries caused to the river ecosystem. These latest constructions would allow a key species of native fish to once again migrate freely between the natural fresh- and salt-water environments needed to complete the life cycle.

The Fishway

The John T. and Jane A. Wiederhold Fishway on the Falls River in Centerbrook is a good example of a state-of-the-art "ladder." Its task? To help the oncoming fish up an 18-foot dam and back into the upper Falls River to spawn.

Here's how it works.

The fishway starts with a narrow concrete "tailwater," or entryway, with a good flow of water for the fish which, by nature, will swim against the stream. The "ladder" is made up of sloped sections called steeppasses, 10-foot pre-fabricated aluminum sections lined with baffles, to slow the water flow. Set at a 20 percent slope, each one will raise the fish about eight feet. At the end of each section is a "turning pool" where the fish can rest before taking on the next "ladder".

A close view of the steeppass fishway that fish will ascend to reach spawning habitat in Millpond, above the dam behind Centerbrook Architects. The vanes on the bottom and sides slow the velocity of the descending water to allow fish to swim upward. There are several level resting pools along the way.

After climbing the three steeppasses, the Wiederhold Fishway ends at the "headpond," in this case, the upper reaches of the Falls River entering the Mill Pond impoundment.

"These fishways reconnect isolated populations of aquatic species, providing access for migratory fish to previously out-of-reach spawning habitat," says Sally Harold, of The Nature Conservancy. "In some cases, they allow us the opportunity to monitor a fish run with a fish counter or camera.

The Target Fish

It's all done for the alewife (Alosa pseudoharengus), a species of North American herring. "These fish are still incredibly important as prey in marine and freshwater food chains and they feed mammals and birds, as well," Harold explains. As an anadromous fish, it lives in two kinds of water environments, and that's the key. The alewife begins life in a freshwater river or lake, making a late-summer or early-fall journey as an adult to a brackish-water estuary. After resting, it moves to the ocean, staying in salt water for up to five years, when it's compelled to return to its home river to spawn.

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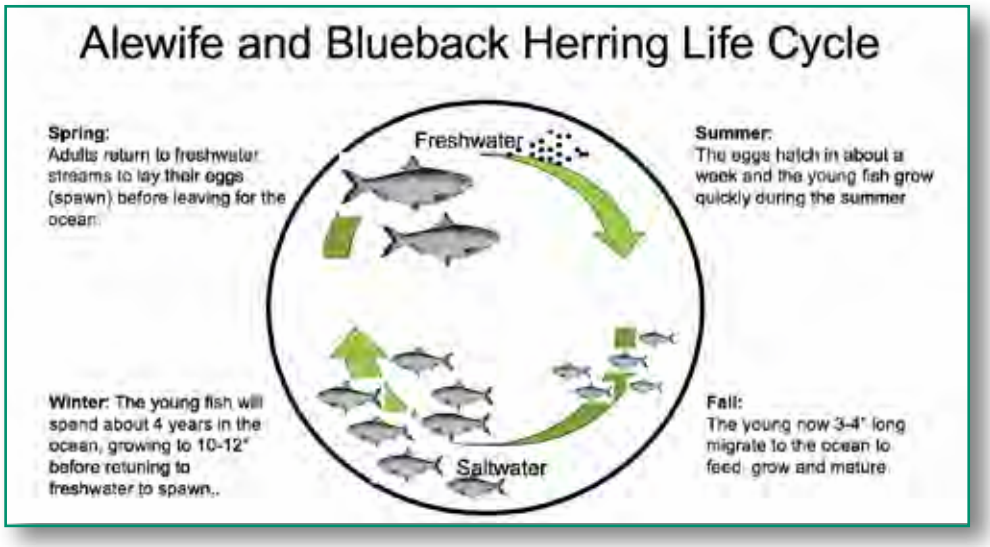
What They've Been Doing



River obstructions in the state have meant that the alewife has largely been spawning in only the lower reaches of rivers or in landlocked waterways. Statistically, landlocked fish grow smaller than their open-water counterparts; the average alewife is about 10 inches long; land-locked fish might be half that size.)

That's meant a general decline for this important species. In salt water, it's a vital food source for Striped bass, salmon and other ocean fish. Vigorous fresh-water populations are tied to larger, healthier sport fish such as Smallmouth and Largemouth bass, trout and landlocked salmon.

For humans, the alewife is an important commercial species along the Atlantic Coast, where it's eaten smoked, salted and pickled and used in pet food and fish meal.

Project Successes

The list of successful fishway projects is growing. Bride Brook in East Lyme has seen the alewife run improve since the construction of a new culvert on Bride Brook. The alewives are back in Rogers Lake, in Old Lyme, after a fishway construction on Mill Brook. "Our river restoration projects are addressing the impacts of industrialization and development, one site at a time," Harold says. "It is my hope that as more people become aware of the potential to restore a river and the value in doing so, we'll have more dam removal practitioners, river advocates and project funders."

Wiederhold Fishway Funding

Restoring fish runs is an involved and costly initiative which requires multiple stakeholders to share in the cost of design and construction. While the John T. and Jane A. Wiederhold Foundation played a leading and significant role in the construction of the fishway, it should be noted that other organizations provided critical funding. These include: The National Fish and Wildlife Foundation Long Island Sound Future's Fund, technical assistance from the Connecticut DEEP, the Electric Boat mitigation fund, the Essex Land Trust, Newman's Own Foundation, the Nature Conservancy and Centerbrook Architects.

Steve Gephard of the Connecticut DEEP and Sally Harold of the Nature Conservancy have worked together on many river restoration projects in Connecticut. They will be delivering a lecture on ***Restoring Historic Fish Runs in the Falls River*** on April 25 at 3 pm at Centerbrook Architects' facilities. **Mark your calendars!**

Dolan Pond-Brushworks Dam and Fishway

By Jim Denham

A short distance from the Centerbrook Architects dam lies what is known as the Dolan Pond or Brushworks dam. This dam goes back to 1820 and was built by Benjamin Williams Jr. and Humphrey Williams. The Williams brothers set up a Fulling Mill to mechanize the carding of sheep wool for the growing textile industry elsewhere in Connecticut. This low 4-foot-high dam is located off of Rt. 154 but is hard to see from the road. The site once powered an ivory mill, a brush factory and then housed a bookstore and antique shop. It currently is rented space for businesses and residence. The dam was damaged but not destroyed in the flood of 1982, probably because it was so low, it offered scant resistance to the floodwaters.

During the summer of 2019, spearheaded by the Nature Conservancy and the Connecticut DEEP, a new dam was constructed along with a fishway that will allow fish to ascend further up the Falls River. Installing this fishway was an integral part of the much larger Wiederhold Fishway at the Centerbrook Architects location. The completion of both these projects now makes it possible for fish migration to return to the Falls River for the first time in 300 years.

Osage Trails - A Perennial Garden Comes Back to Life

By Pam Peters

2018 marked the 20-year anniversary of Diz Callender's generous donation of the property known as Osage Trails to The Essex Land Trust (ELT). This eight-acre parklike setting is a testament to Diz's commitment to beautification and green space preservation. In the fall of 2018, the ELT decided to recognize Diz's wonderful gift by revitalizing the perennial garden she kept and loved when she lived on the property.

The revitalization started with a targeted cutting of what appeared to be mostly weeds in October and November of 2018 along with a good raking to clear out numerous years of plant debris. Then I eagerly waited for spring to see what, if anything, would come up and bloom. Other than some irises, it was anyone's guess what might have survived over the years. In March it was exciting to see some daffodils sprout, as these were one of Diz's favorites. By April the irises were looking healthier having been uncovered from inches of debris and we discovered that mugwort was the prevalent plant filling in most of the original footprint of the bed. While mugwort can be used as an herb and for medicinal purposes, we were sure it wasn't quite what Diz had in mind for a perennial garden of blooms. So, this was our starting point.

It was time to call in the volunteers!

Early in May a group of ELT volunteers with garden and perennial experience worked on a third of the approximately 1,300 square foot garden lifting the irises and daffodils in preparation for a larger clearing effort. The ELT Volunteers were: (Front row) Suzanne Kitchings, Cynthia Field, Catharine Wagner, Lisa Krall and (Back row) Deborah Walters, Mara Johnson, Jennifer Gill, Dagmar Miller. Not pictured: Wilk Miller.

A few other perennials were marked to be worked around and we called in reinforcements in the form of The Community Service Day VRHS Warriors. With the help of The Warriors and their Advisor, we were able to clear the mugwort from the first third of the garden.

The ELT Garden Volunteers then followed up by replanting the daffodil bulbs and irises that had been lifted before the team dig. This wonderful group effort gave us a terrific start on the overall revitalization.

Through the summer of 2019 the ELT Garden Volunteers continued to watch for other perennials sprouting and blooming, and were rewarded with many happy surprises of original plantings coming back to life.

These included beautiful anchor shrubs of lilacs and two butterfly bushes. A variety of iris, penstemon, peony, white and purple vinca, lily of the valley, pincushion flower, black-eyed susan, and stunning butterfly weed also showed up as original plantings.

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To fill in some of the gaps and encourage pollinators to the garden other perennials were donated by Dagmar and Wilk Miller, Catharine Wagner, Cynthia Field, Glenn Jacobsen, Carol Denham and Pam Peters from their personal gardens.

Weeding continued on a regular basis to keep the mugwort in check and to clear weeds from another third of the garden. As we continued our way around the garden we found the second most prevalent unwanted plant to be poison ivy. A call went out to the other Stewards to find out if any could help remove the poison ivy, and Tom Rutherford joined our happy group of volunteers to pull a 5' x 6' area clean so we could continue with the garden care.

A special note of thanks to Catharine Wagner for spending many a hot and humid morning in the garden helping keep things in order. Here a silvery checkerspot sits on her shoulder personally thanking her for her efforts.

The team's efforts have not gone unnoticed by local wildlife either. Fortunately, the deer that walk through the garden haven't found any snacks to their liking yet. Most of our visitors appear to be of the winged families. At times in the garden we've seen no less than two dozen monarchs along with a number of tiger swallowtails and painted ladies.

Did you know that monarchs are colored orange and black as a warning to predators that they are toxic when ingested? The sap of the milkweed, which is their food supply as caterpillars, contains a toxin (cardiac glycosides) which makes them noxious to birds.

While in the garden we have spotted milkweed tussock caterpillars and learned that while they are also orange and black in caterpillar stage, their primary predators are bats. Naturally the question is - how does that help as a warning in the dark? Apparently, tussocks have an organ that uses the milkweed chemical to emit an ultrasonic signal warning to bats that it will be a noxious meal.

We also have a lovely ground nest of small bees, possibly bumblebees. If you visit the garden you will see a bit of mugwort left in the area of the nest. The bees are quick to let us know when they feel we're getting too close to their home, and as beneficial pollinators we want them to be happy.

Our journey of Diz's garden revitalization is expected to continue through the spring and into this year's growing season. At that time, we are hopeful that we will have had enough time to remove any other unwanted plants and will focus our ongoing attention on maintenance and guiding the garden design as the plants self-seed and continue to fill in.

We hope you'll stop by Osage Trails to enjoy the beautiful setting that Diz left for all of us. And be sure to take a stroll by the garden to enjoy the colors of the blooms, or pause for a little Zen as you enjoy our feature sculpture designed from stones unearthed during the big spring cleanup.

Cross Lots Dogwoods - Some Not So Tender Loving Care

By Jeff Croyle

The casual hiker out for a walk on the paths at Cross Lots may have noticed a few days this past fall when the Dogwood Field by Route 154 was roped off with caution tape. More observant hikers would have noticed something far more significant – that none of the 150 dogwoods bloomed this year. What was happening?

When the Land Trust received this 15-acre parcel from Harriet Cheney Downing's estate in 1990, the terms of the bequest stipulated that the house and all the outbuildings be razed and the land be brought back to a natural state. Once the buildings were removed, the plan was to clear-cut all the fields before designing the hiking trails. But according to Bruce Glowac, who was involved at the time, it was decided to leave the naturalized dogwoods that had begun to sprout along Route 154. The Land Trust team removed the hay and non-dogwood trees from this area and established a trail loop through the field. When asked who designed the planting pattern for the trees, Bruce responded with "Mother Nature and a brush hog". The Land Trust had a four-foot wide brush hog so that became the minimum distance between trees. Once the field was opened up, the team selectively thinned out weak, crooked and crowded dogwoods so that the better specimens could thrive. Which they did.

This photo, circa 1993, shows the dogwoods in bloom. Unfortunately, there was not a single bloom in 2019.

In August, Land Trust stewards walked the Dogwood Field with Augie Pampel, the Essex Tree Warden. Besides noting the obvious poison ivy problem and overcrowding in many areas, Augie's diagnosis was that the dogwoods had anthracnose, which impacted many other tree species in our area. Dogwood anthracnose is a serious disease that is difficult to control and causes stem cankers and large, purple-bordered leaf spots. His opinion was that the dogwoods should survive but may not be able to resist other diseases that attack them. Augie provided his guidance on which trees should be cut down and which just needed a good pruning. A work plan was developed.

In September, our stewards cleared out most of the poison ivy, did a close mowing of the field, and removed the climbing vines. Trees were tagged to be cut down or the limbs to prune. In November while the dogwoods were in their dormant stage, stewards cut down 24 trees that were dying, leaning or overshadowed by larger trees. The next day, stewards along with some volunteers carted away 18 truckloads of debris. The field is much more open now with ample space for the remaining trees to grow and thrive – assuming the anthracnose does not come back. Of course, we won't know if our work is successful until late April or early May 2020. That's when the blooms should appear. Keep your fingers crossed and we will keep a close eye on the dogwoods.

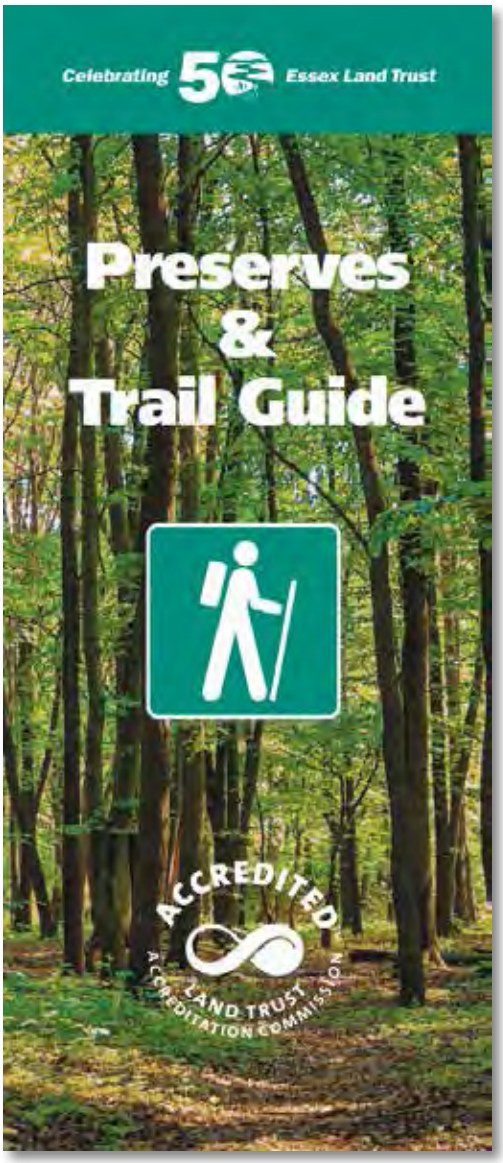
ELT Briefs

Rockfall Foundation Award

The Essex Land Trust was honored recently with the 2019 Rockfall Foundation Tom ODell Distinguished Service Award. This recognition is given to an organization or individual for outstanding ongoing or long-term accomplishments. Among other accomplishments mentioned in the citation, the Essex Land Trust was recognized "as a model organization among land trusts…. They have a tradition of partnering with other organizations to achieve conservation and preservation goals, and generously share their expertise with other land trusts and conservation organizations."

The Tom ODell Distinguished Service Award was named in memory of this Westbrook resident given his many years of environmental service in the Lower Connecticut River Valley and for his many contributions to the natural world.

ELT Vice-President Bob Nussbaum receives the Tom ODell Distinguished Service Award from President Marilyn Ozols and Executive Director, Tony Marino.



New Essex Land Trust Trail Guide

The Essex Land Trust has recently published its new Essex Land Trust Preserves and Trail Guide. Since our first Trail Guide 2008, the land trust has added 173 acres to its holdings by expanding the size of existing preserves and acquiring 4 new preserves. The Essex Land Trust now owns 650 acres and is involved in managing an additional 250 acres of Town open space properties. This 2019 version has a number of features:

- All maps have been created from scratch using GPS to improve both the precision and the quality of the maps;
- We have updated the Town of Essex Open Space map to provide an overview to all properties located in the villages of Centerbrook, Essex and Ivoryton;
- The individual descriptions have been revised and updated to ensure more current information about each preserve;
- New pictures specific to the preserves have been incorporated.

This new Trail Guide has been funded by the land trust as well as with contributions from Robert and Theresa Dryfoos, The Community Foundation of Middlesex County, Essex Savings Bank, and Essex Printing. Mirto Art Studio created the maps, Long Cat Graphics was responsible for overall design, and Essex Printing helped in bringing the final product to fruition.

All new land trust members will receive a free copy. Several local retail outlets will be selling the Trail Guide for $15.00. Additional copies can also be ordered by emailing info@essexlandtrust.org.

Now it's time to get out and explore some of the many preserves in our community with this trusty new trail guide in hand!

Coming Events – Mark Your Calendar!

What is The Blue Plan?
Thursday, January 23, 7pm
Essex Town Hall, 29 West Avenue

Bears Revisited
Tuesday, February 4, 7 pm
Essex Town Hall, 29 West Avenue

An Introduction to the Essex Land Trust
Saturday, February 29, 4 pm
Essex Library, 33 West Avenue

Pollinators
Monday, March 2, 2pm
Essex Town Hall, 29 West Avenue

The Living Landscapes — Native Plantings for Beauty, Sustainability and Habitat
Thursday, March 19, 7 pm
Essex Library, 33 West Avenue

Essex Land Trust Annual Meeting
Thursday, April 16, 5:30 pm
Essex Meadows, 30 Bokum Road

Restoring Historic Fish Runs in the Falls River
Saturday, April 25, 3 pm
Centerbrook Architects – THE CUBE
67 Main Street, Centerbrook

Birding and Nature Walk
Saturday, May 16, 8:30 am
Essex Meadows, 30 Bokum Road

Discovering Opossums
Tuesday, May 19, 7 pm
Essex Town Hall, 29 West Avenue

Canoe/Kayak Trip to South Cove
Saturday, June 13, 2 pm
Public Boat Launch, Essex Town Park

Annual Concert in the Park
Saturday, June 13, 5:30 pm
Essex Town Park, Essex

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