Stream Vegetation & River Herring

Presented by:

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RIVERWAYS PROGRAM

Mission: To promote the restoration and protection of the ecological integrity of the Commonwealth's rivers, streams and adjacent lands.

Water Quality

Healthy Stream Flows

Land Along Rivers and Streams

Habitat for Fish & Wildlife in River Corridors

River Continuity

Public Access To and Along Rivers

Commonwealth of Massachusetts

DIVISION OF ECOLOGICAL RESTORATION

Mission of the new Division of Ecological Restoration (DER):

"To restore and protect the health and integrity of the Commonwealth's rivers, wetlands and watersheds for the benefit of people, fish and wildlife."

Water Quality Benefits conferred by Riverine Vegetation:

A – plant roots **filter out excess nutrients and other pollutants** before they reach the water

B – living/dead vegetation on the ground **helps slow runoff**, intercepts sediment and reduces erosion

C – Roots, as well as other living and dead vegetation extending into the water, **provide surface areas for pollutant-eating microbes**

D – Trees and other riverine vegetation **provide shade** that helps to keep the water cool and dissolved oxygen levels high enough to support trout and other sensitive organisms. Also, **less algae** grows in shaded streams due to the reduced sunlight

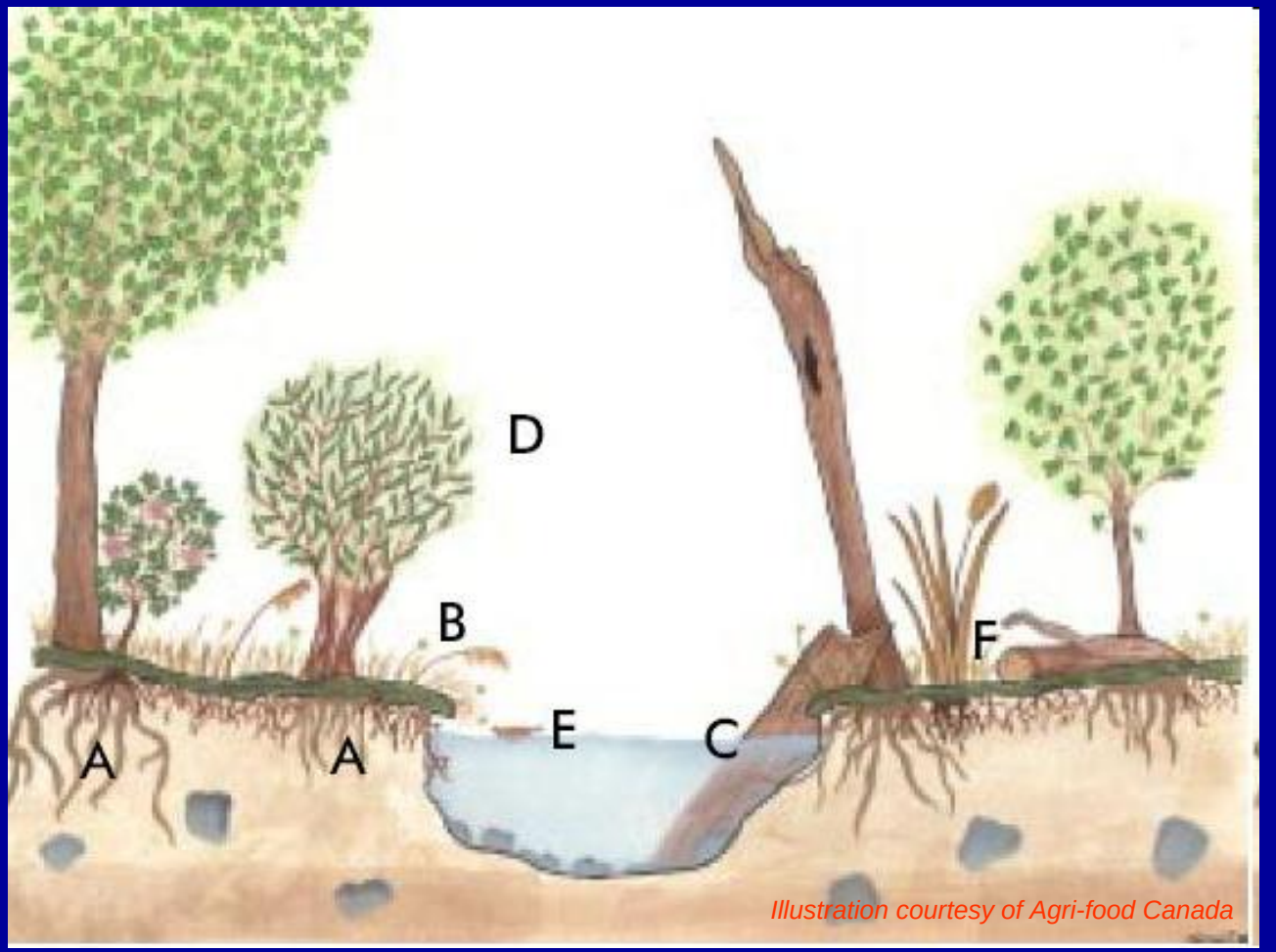


Illustration courtesy of Agri-food Canada

E – Leaves, twigs, insects and other natural items (not lawn clippings!) falling off streamside vegetation and into the water help provide healthy fuel for the aquatic food chain

F – riverine vegetation enhances infiltration of precipitation into the ground, where it can replenish aquifers and streamflow. Higher "baseflows" dilute pollutants and mitigate stream heating

Interpretive sign at a stream restoration project

A good example of “Nature is messy”: Large Woody Debris (LWD, also known as “woody habitat”) in a stream, along with lots of streamside vegetation

Good example of “structure”: wood above and below the surface of the Quinebaug River in Sturbridge – Anglers know fish are often lurking in such places

And so do Great Blue Herons…

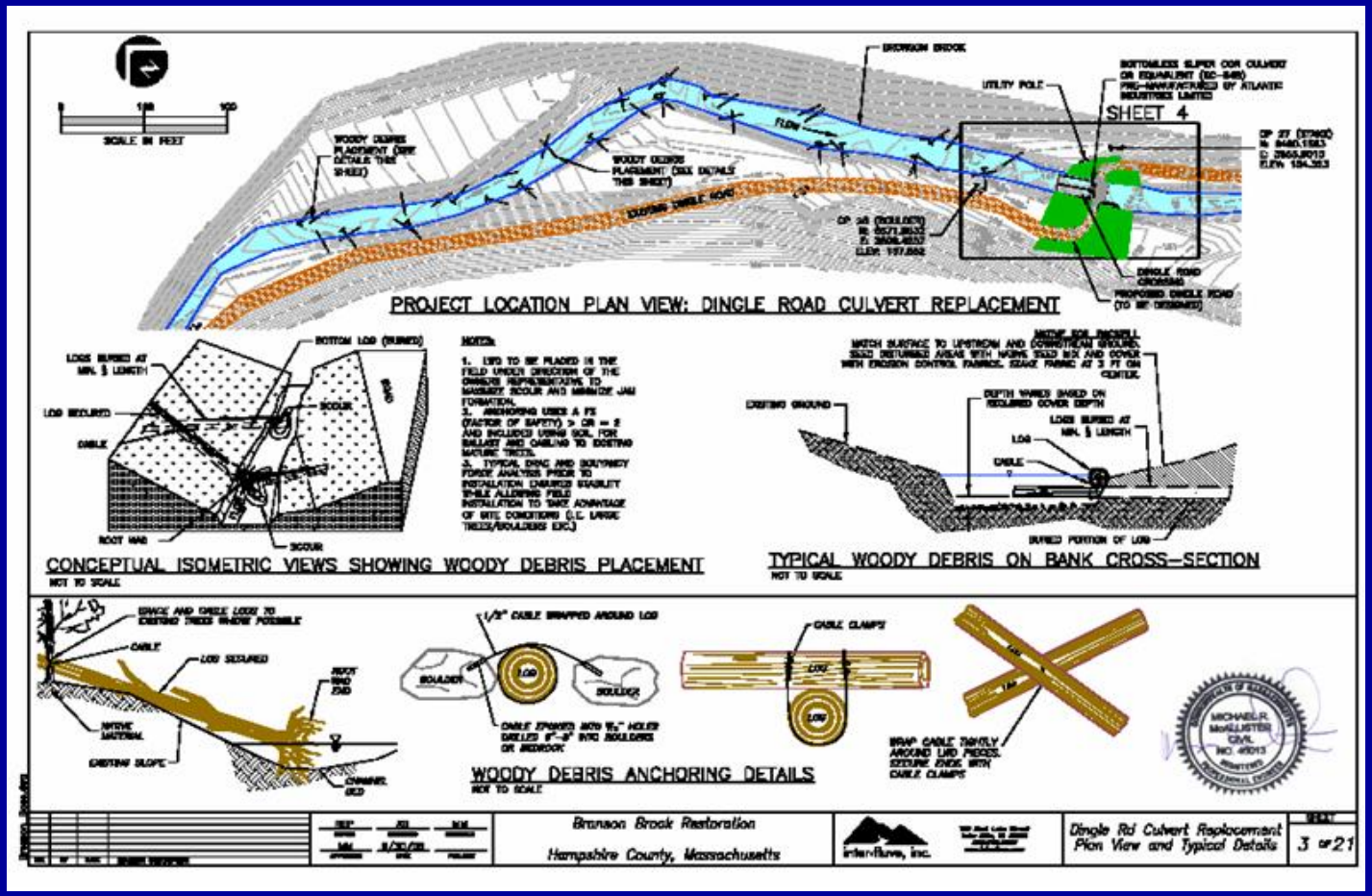
and Kingfishers…

A brook trout utilizing vegetation in the water to hide from predators and prey

Turtles (like this painted turtle) are frequently spotted basking on logs in the river on warm days

Snakes (like this Northern Water Snake) also take advantage of riverine vegetation for basking and moving around on

Restoring Woody Habitat



River scientists think having trees and other large wood in rivers is so beneficial to riverine ecology that they are actively seeking opportunities to add large wood to rivers

An example from the Shetucket River in Sprague, CT, where the CT DEP installed several “constructed log jams” into the river to enhance fisheries habitat (see http://www.ct.gov/dep/lib/dep/fishing/restoration/shetucketriver.pdf for more details)

An example from Massachusetts: the Eel River in Plymouth, where the MA Division of Ecological Restoration added logs to a segment of the river flowing through a former impoundment to enhance its habitat complexity - see the link below for more details: http://www.mass.gov/eea/agencies/dfg/der/aquatic-habitat-restoration/eel-river-restoration-project.html

Volunteers planting native plant species along the banks of the Housatonic River in Great Barrington, MA. This planting took place after invasive species (Japanese Knotweed, e.g.) were removed

Tree fallen completely across the Squannacook River in Townsend creates an obstacle for paddlers but provides “structure” for fish as well as a bridge for animals (and people).

Another view of that same tree

Here’s evidence, from the winter, of where an animal (a bobcat?) utilized this same tree fallen completely across the Squannacook River in Townsend to cross the river without getting wet (yellow arrows indicate paw prints heading to and on log)

Here a kayaker is safely “limboing” under a tree that has fallen completely across the channel of the Fort River in Amherst, MA.

Here’s what was hiding out underneath that “limbo” tree over the river

For this tree, overhanging the Town River just upstream from the Bridgewater public access boat launch (where person is standing), the stubby branch remnants under the "arch" portion of the tree (a) could be sawed off to facilitate paddling underneath the arch. Alternatively (or additionally), the last few feet of the branch on the right (b) could be trimmed off, enabling paddlers to paddle around the tree rather than ducking under the arch.

The small branches sticking up in over the submerged portion of the tree trunk in the middle of the channel (see arrow) could be removed to facilitate safe paddling over that portion of the tree without harming the ecological functions of the remainder of the tree.

Town River in Bridgewater, looking upstream from paddler access point

An excellent example of judicious pruning on the Ipswich River in Topsfield, where only a small section of the lower tree limb was cut and removed (see arrow) to enable paddlers to safely avoid the logjam, while leaving the remainder of the fallen trees in place to fulfill their ecological functions and values.

Here's someone operating a chainsaw to remove a section of tree that is blocking a fast-moving section of channel. Note the helmets and PFDs worn by the workers, as well as the rope tied on to the other end of the tree to help secure it. People attempting such work must be fully trained in safety procedures. Ideally, it would have been better to have done this work at a lower flow level.

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August 1, 2012

Royal River restoration

A three-day cooperative effort has begun to remove 25 granite blocks that once formed a dam on the Yarmouth waterway. And advocates hope it's just the beginning.

Here's a story about how a cable winch (also known as a grip hoist or come-along) device was used to relocate granite blocks from a collapsed dam to facilitate fish passage. The same technique can be employed to relocate logs in a river to locations where they no longer pose a safety hazard to paddlers.

Snags and strainers can accumulate floating trash. The trash isn't the tree's fault. Removing the tree (after first cleaning up the trash accumulated behind it, of course) would only be a short-term solution, and would just enable future trash to float further downstream. Better to reduce the trash at its source (empty/relocate overflowing dumpster near the river, educate citizens not to litter, etc.)

Of course, removing man-made debris like this from the river is good to do.

Shopping carts in the Neponset River. New technology that causes cart wheels to lock when removed from a supermarket's parking lot should reduce this problem.

Logs and other debris backing up against a bridge abutment can create a potentially dangerous condition. Although paddlers can currently avoid this obstacle by paddling around it to the right (see arrow), were additional logs or other debris to be backed up here, it could potentially undermine the stability of the bridge and/or cause significant upstream flooding. DPWs may need to act to remove the blockage in such a situation.

On the subject at hand: **whether, and to what extent, is human intervention (like clearing vegetation from streams) necessary to facilitate herring passage**?

Consider the subject from the fish's point of view: imagine the fish pondering (to the extent they are capable of doing this) "can I figure out how to reach, and succeed in reaching, my spawning water on my own, and if not, do I need humans to help me, and, if so, how?

- so, before taking a specific action, like cutting a tree over a stream, a person should ask him/herself: to what extent (if any) is this particular action helpful and necessary in enabling the fish to reach their spawning water?
- if not: while there may be other valid reasons for taking the action, they ought to be identified too (ideally before the stream work commences). Sometimes there are tradeoffs between objectives (e.g., removing invasive plants might remove beneficial shading and cover, and expose the stream (and the fish) to excessive sunlight, predation opportunities by seagulls, etc.)
- on the subject of invasives, some plant species thought by many to be invasive (like wild grape vines, poison ivy, cat brier) are in fact native species, and our anadromous and other fish have evolved to cope with their presence in the landscape.

“Before” and “After” photos from the Santuit River

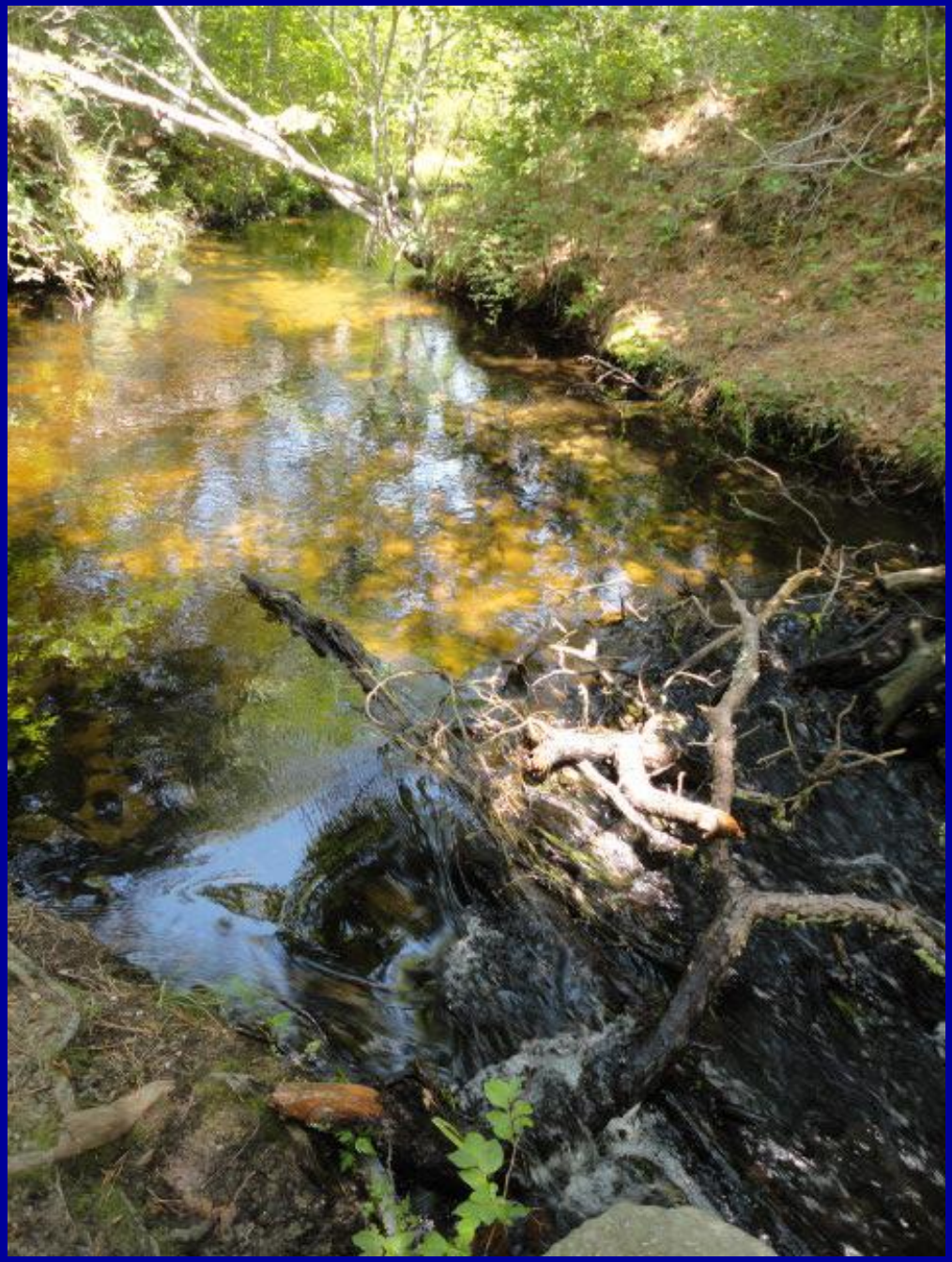
Note what was removed and what was not.

Centerville “before” photos (see above left and right), looking upstream at apparent blockage - but water is getting through (moving underneath) – could the fish as well?

Centerville “after” photo (at right)

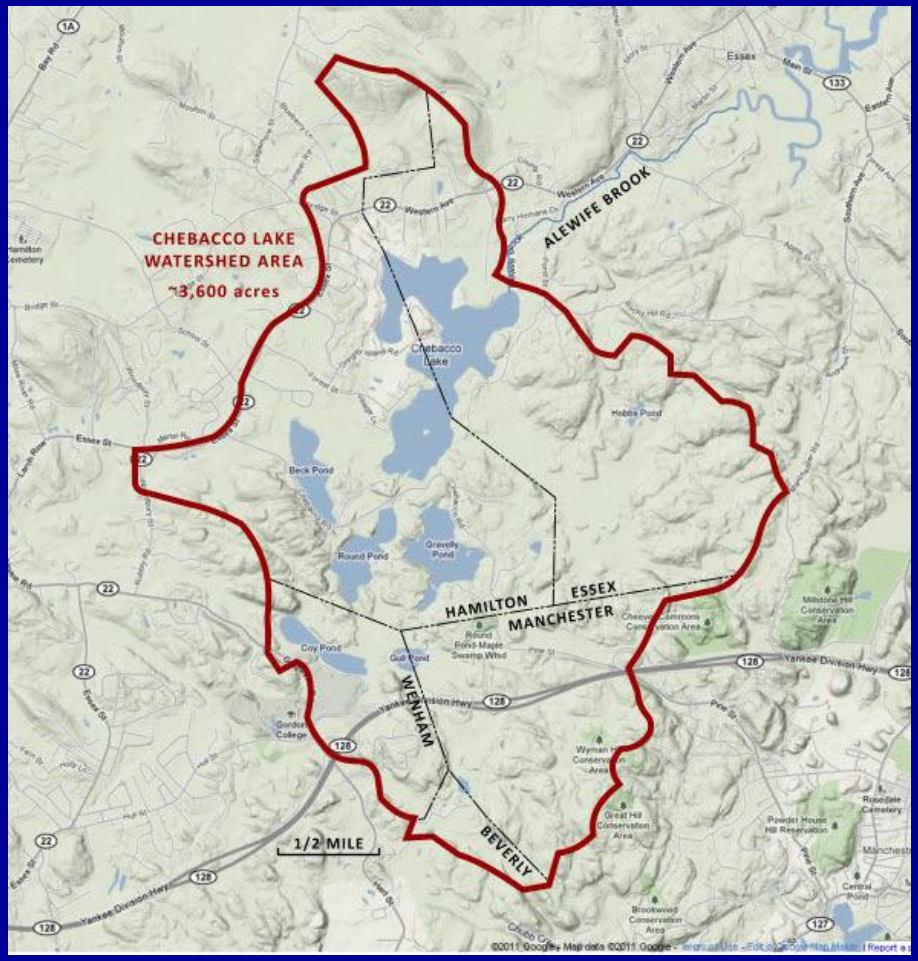
Another example of apparent blockage (below Mill Pond in W. Barnstable ?) - but if water is getting through, could the fish as well? Also note how stream flowing through LWD and stones might affect substrate sorting and deposition, helping to create good fish spawning and benthic macroinvertebrate habitat

Another example (LWD fallen into the Skunknett River) – does this appear to impede up- or downstream fish passage?



View of the Skinnequit Herring Run, east of Uncle Venies (Red River, Harwich) - does the Phragmites block fish passage? If so, what (if anything) can be done?

Alewife Brook Chebacco Lake story



Questions?

Red Brook (supports sea-run Brook Trout), Massachusetts

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