

Trees, Paddlers and Wildlife - Safeguarding Ecological and Recreational Values on the River

Presented by:

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Mass. Department of Fish and Game

Division of Ecological Restoration (DER)/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.”

DER and the Appalachian Mountain Club (AMC) have collaborated on a video, brochure and web page (see <http://www.outdoors.org/conservation/issues/rivers/river-recreation-ecology.cfm>) to educate paddlers and others about the functions and values of trees and wood in/along the river, and to encourage its retention except where significant public safety issues necessitate some judicious pruning, relocation or removal

THE GUIDE

Returning to our discovery of a tree in the river, there are several key issues to consider before taking any action:

FIRST: When looking at large woody vegetation in the stream, think about the following items before deciding what, if anything, to do.

1. How big is the obstruction? Has a large tree or branch fallen and entirely or mostly blocked a passage along the stream?
 - a. If it is safe to paddle around or under it, in high and low water, no further action may be needed.
 - b. If the log or branch is completely across the stream, look for evidence of a portage path on the bank and portage if possible.
 - c. If it is not safe to paddle around or through, and if portaging is not feasible, consider trimming a few feet of the smaller-branched end of the tree so that all paddlers can safely pass around the log at all water levels.
 - d. If the current will not permit most paddlers to get to the narrow end of the tree, and there is a potential hazard of boaters being pinned against the trunk end at higher flows, consider removing a few feet from the trunk end.
2. Consider the time of year. Is this a high water or low water season? If paddlers can "limbo" under a branch at low water, will they still be able to pass safely during high water? If not, see #1 above.
3. Look at the whole reach of the stream. Are there many other woody obstructions within a few hundred feet upstream and downstream? Is it practical to move or trim them all? Is it feasible to portage that whole stretch of river, or is it better to return the way you came?

SECOND: If your assessment indicates that some tree cutting or removal is necessary, follow the rules below.

NOTE: Before you undertake any action on the river, discuss your proposal with landowners and the Conservation Commission to obtain any needed permits or permissions and to inform them of your plans, particularly if you plan to trim or remove a significant amount of vegetation, and to address any concerns about sedimentation, other water quality issues associated with work in the river, or habitat impacts.

The first rule for working on the river is to keep safety in mind. Make sure you have the advice and participation of someone skilled in using the appropriate tools and techniques for working in a river. This person should also have the ability to plan for the safety of individuals and the group in accessing and removing the vegetation.

The second rule is to cut or trim only as much wood as needed to provide safe boating passage at high and low water levels. Most paddlers enjoy paddling around some obstructions, although novice paddlers may need a bit more room to maneuver. Keep in mind that there will be a variety of paddlers using the river, and trim appropriately. In most cases, large branches should not pose a problem for local backwater and flooding and may in fact attenuate downstream flooding. In a few cases, woody debris piles at bridges or culverts may threaten their structural integrity. In these cases, removal by a highway department or other municipal or state entity may be appropriate.

For additional information about evaluating riverine vegetation, contact Russ Cohen at the Riverways Program, 617-626-1543 or Russ.Cohen@state.ma.us.

TREES, PADDLERS AND WILDLIFE

Safeguarding Ecological and Recreational Values on the River

Appalachian Mountain Club

Massachusetts Department of Fish and Game
Division of Ecological Restoration
Riverways Program

AMC

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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

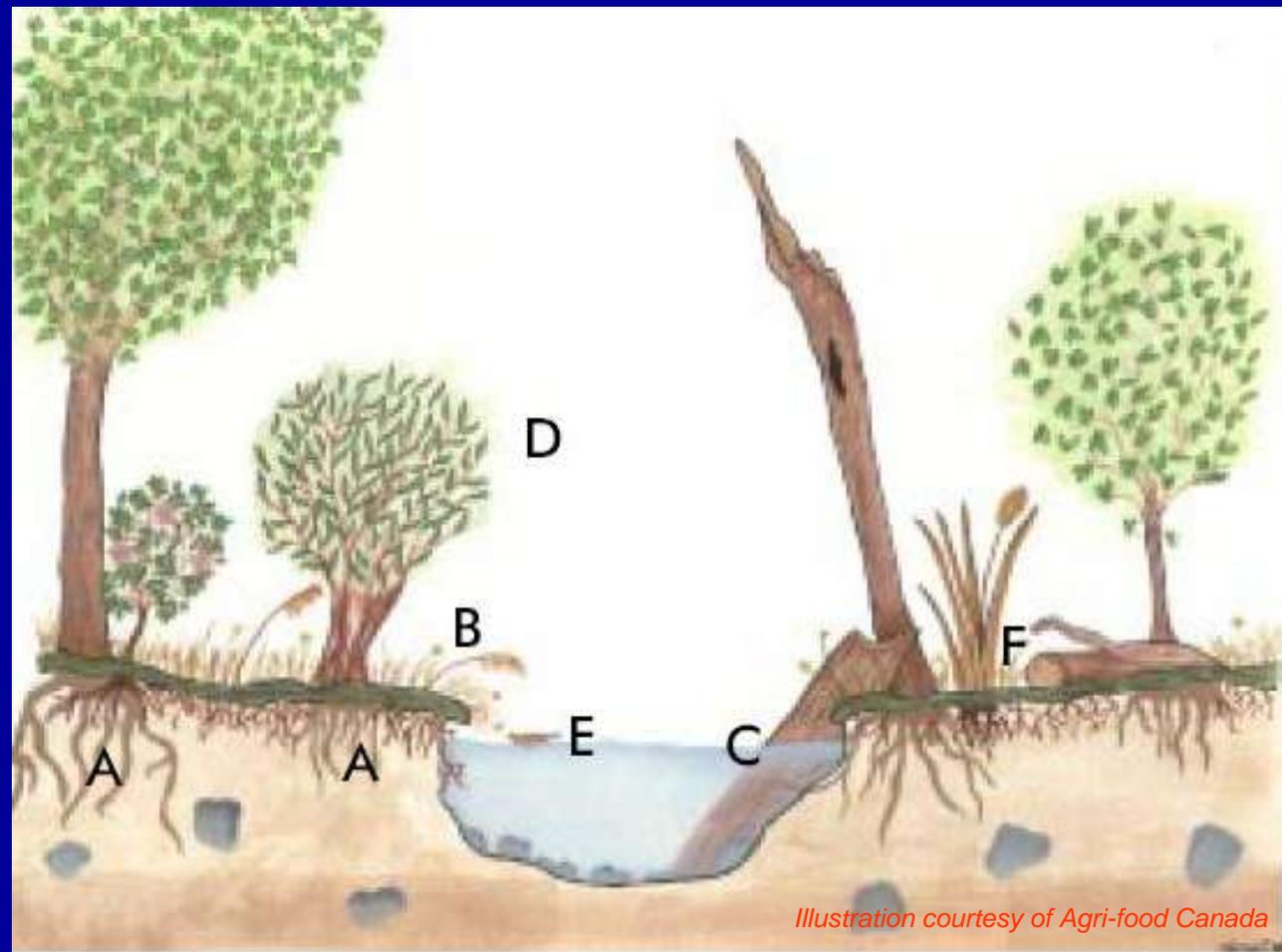


Illustration courtesy of Agri-food Canada

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



NATURE IS "MESSY"



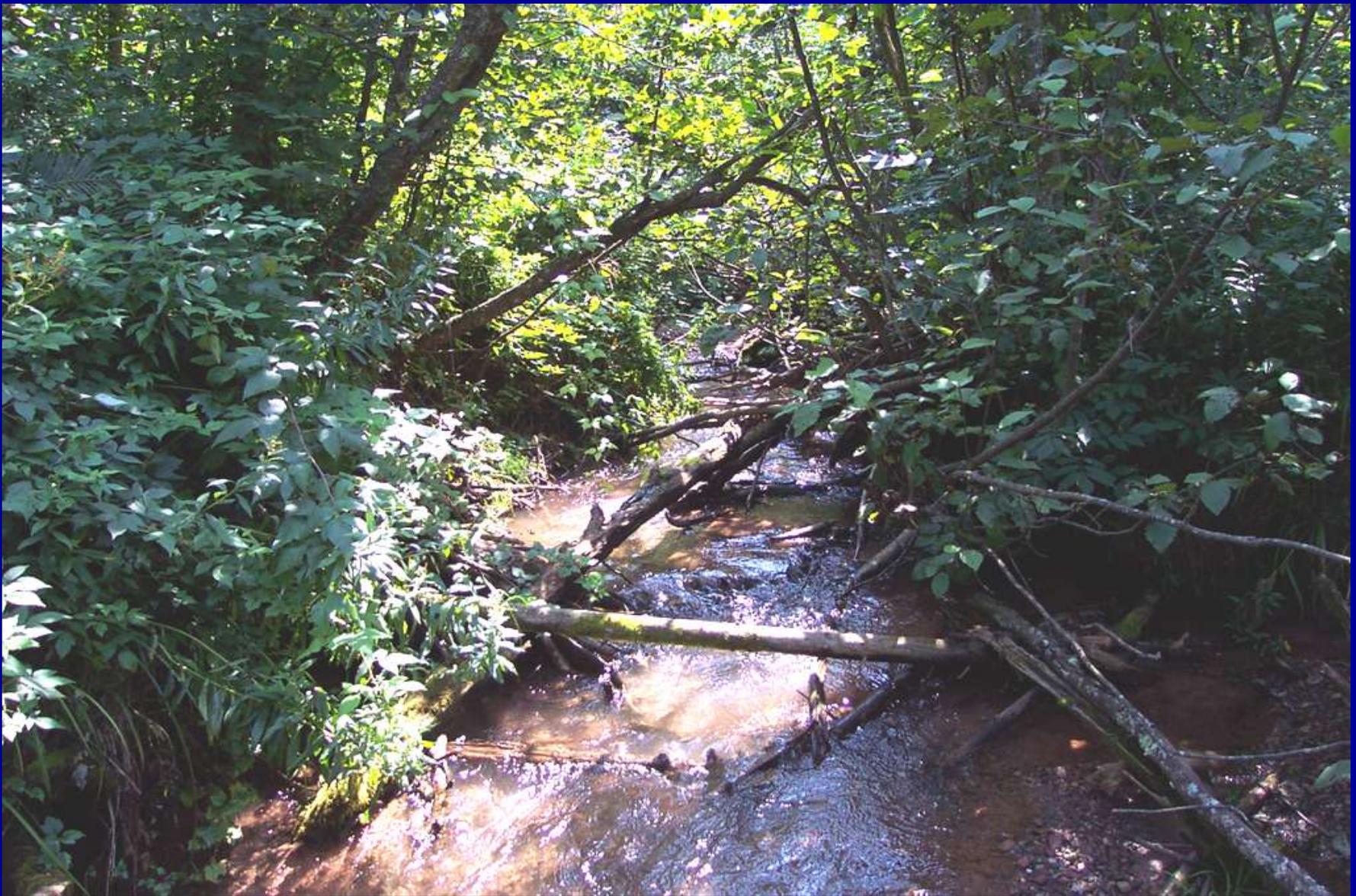
Though this stream has been restored it doesn't appear "neat" and "straight". That's because healthy natural streams are messy, which is what we tried to mimic. Meanders, or curves, allow a stream to dissipate the energy of flowing water and help it move sediment downstream.

Logs and tree roots in the stream provide habitat for fish, turtles, and insects. Grass, shrubs, and trees on the stream bank make cover and food for birds, frogs, snakes, and other wildlife.



Eastern painted turtle

Interpretive sign at a stream restoration project



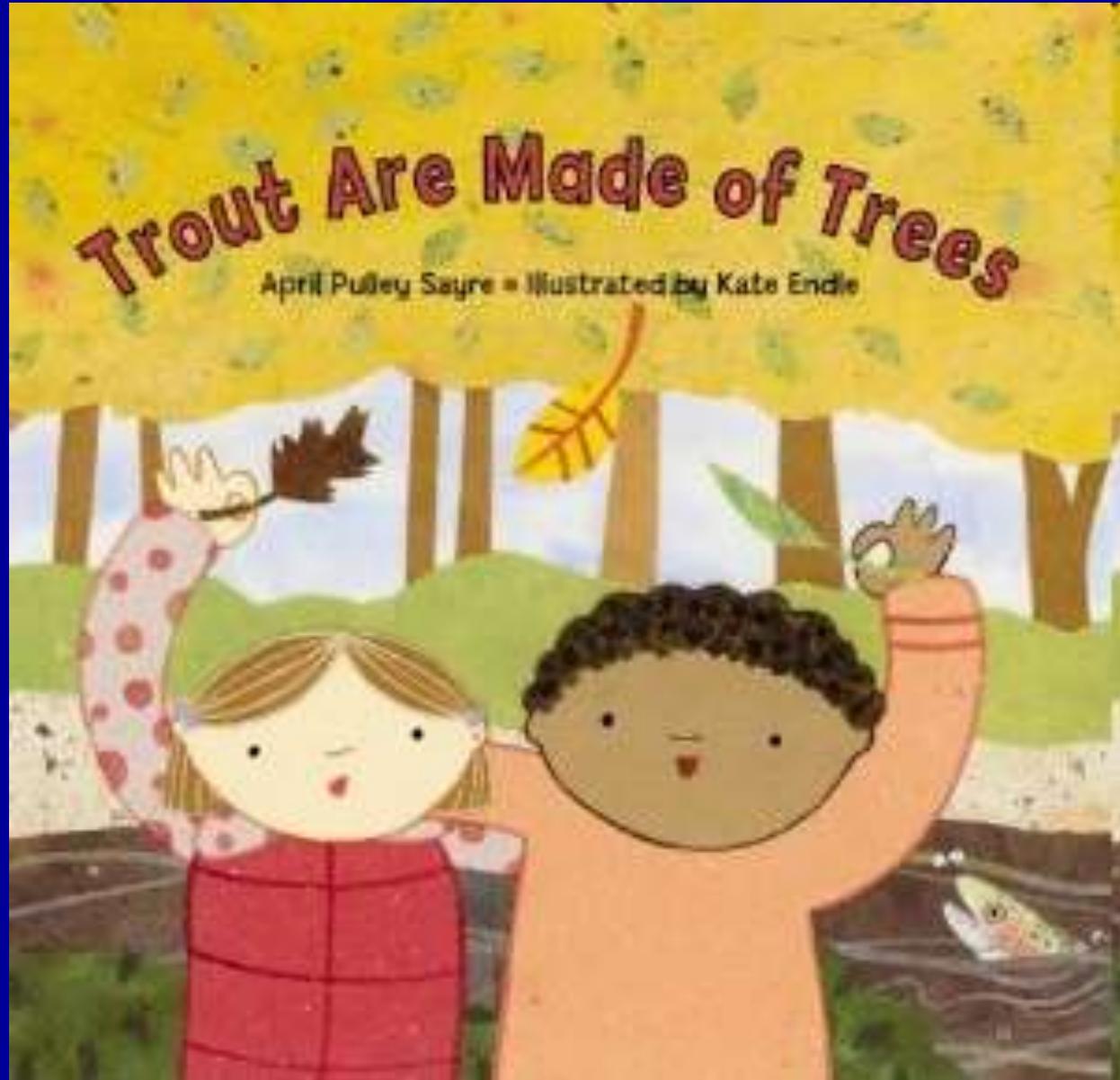
A good example of “Nature is messy”: Large Woody Debris (LWD, also known as “woody habitat”) in a stream, along with lots of streamside vegetation

Trout are Made of Trees – children's book (ages 4-7)

“How can a leaf become a fish? Join two young children and their dads to find out, as they observe life in and around a stream.

Energetic collage art and simple, lyrical text depict the ways plants and animals are connected in the food web.

Back matter provides information about the trout life cycle as well as conservation efforts that kids can do themselves.”





Looking upstream, a large oak tree has fallen almost completely across the Assabet River in Concord. While this tree may back up a bit of water behind it, causing minor flooding, it is also helping to mitigate the velocity and volume of the river's flow, which helps attenuate problems downstream.



Forested floodplains provide habitat and a place for floodwaters to back up onto instead of rushing downstream and potentially causing problems



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...

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 <http://www.mass.gov/dfwele/der/freshwater/priorityprojects/eelriver.htm> for more details)





Volunteers planting native plant species along the banks of the Housatonic River in Great Barrington, MA

Native Species Suitable for Planting in Riparian Areas



Meadow Beauty

Rhexia Virginica



Rose Mallow

Hibiscus moscheutos (palustris)

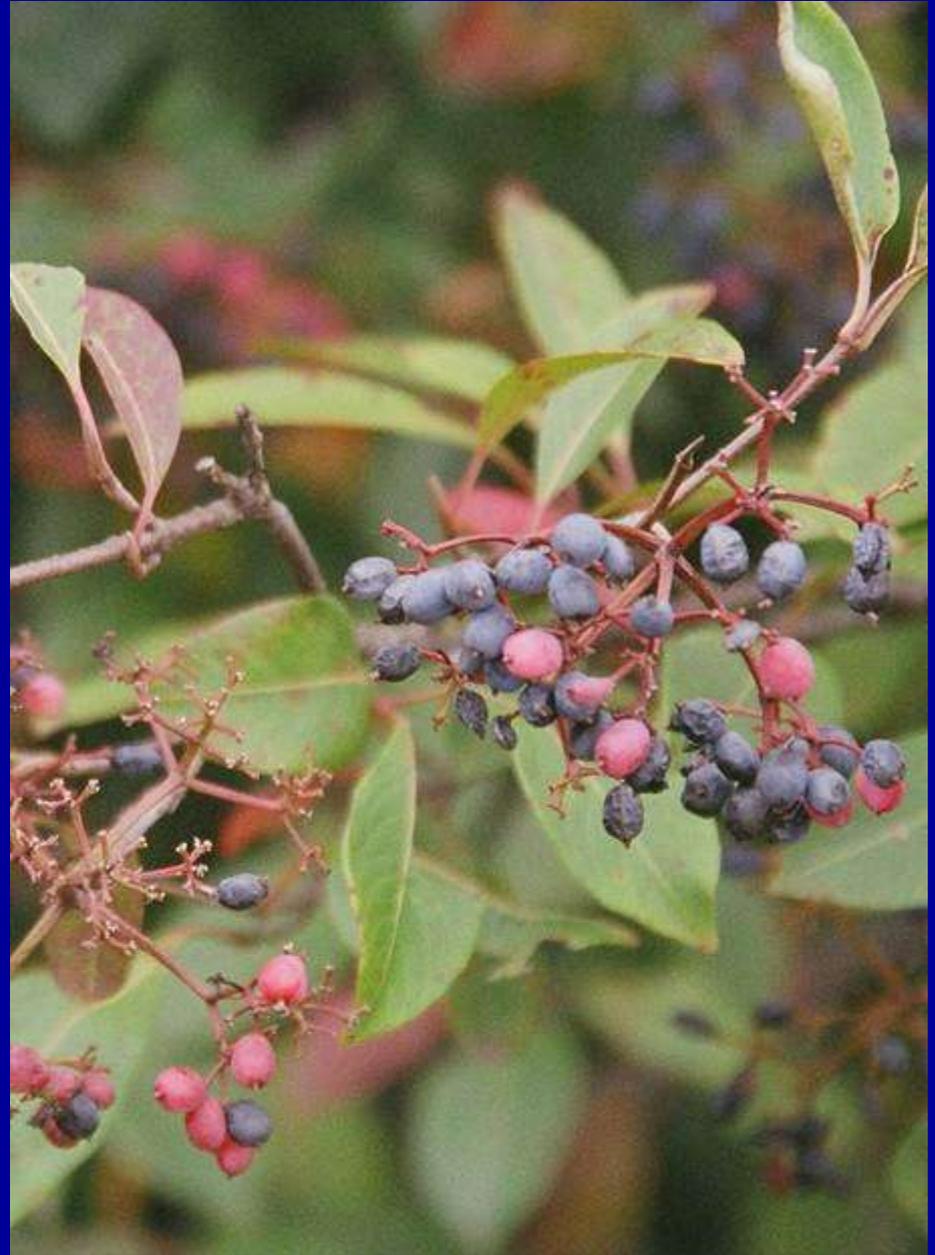
Juneberry (Shadbush/Serviceberry) - *Amelanchier canadensis* and other species



Elderberry - *Sambucus canadensis*



Nannyberry or Wild Raisin - *Viburnum lentago* or *cassinoides*



Blue
Huckleberry
or
Dangleberry
(*Gaylussacia
frondosa*) -
prefers
slightly
damper
habitat than
the Black
Huckleberry
- the plants
also tend to
be somewhat
taller and
the fruit
ripens 2-3
weeks later



Wild Grapes - Riverside (Concord) and Fox Grape, *Vitis riparia* and *V. labrusca*





Spicebush
(*Lindera benzoin*) - likes to grow in damp, shady areas near flowing water - can steep the twigs for tea, plus the dried berries make a fine Szechuan Pepper-like substitute

This tree fallen into the water provides good perching opportunities for birds and cover for fish without posing any kind of a safety hazard for paddlers.



East Branch Housatonic River, Pittsfield, April, 2011



AMC paddlers on the Squannacook River in Townsend successfully maneuvering around riverine vegetation (no portage or clearing necessary)



Paddlers easily making their way around a tree that has fallen into the water.



Kayaker squeezing through a spot where the submerged portion of a large tree across the river can be paddled over.



Although a log lies completely across this river, the water level is high enough to paddle over it (see arrow).



Same spot, but at a lower water level. If the water is too shallow to paddle under or over the log, or to safely drag the boat over the submerged portion of the log, then a (short) portage may be required.



Paddlers good-naturedly working their way through riverine trees and wood on the Nashua River (*photo by Roger Leo*)



Paddlers lifting boats over a large tree that had fallen completely across the Fort River in Amherst, MA



Beaver dams are often encountered on smaller rivers; they can usually be easily portaged over by standing on the dam, and, at higher water levels and/or with enough paddle power, can be run



Paddlers lifting their boats over a large White Pine tree that has fallen completely across the Nashua River. That same tree offers a good opportunity for animals (and people!) to cross the river without getting wet. (Photo by Roger Leo)



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)





Canoeists ducking under a tree that has fallen into the Town River in Bridgewater, MA



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 could be sawed off to facilitate paddling underneath the arch. Alternatively (or additionally), the last few feet of the branch on the right 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



This immense tree completely blocks the channel of the Town River in Bridgewater. It is impossible to duck underneath it or lift a boat over it without getting out of the boat. There are other large branches just downstream from this big trunk that contribute to the fact that removing this obstruction would be a big job, bigger than the capacity of most volunteers to take it on. So what (if anything) should be done? We all agreed that the bank on river right was too steep to enable a safe portage around this massive tree. Fortunately, however, the current is slow, the bank on river left is very low, and an informal portage path around the tree had already been established at this location. Some of us got out and took a look at this portage path, and it looked feasible for others to use. So the decision was made to leave this tree in place and portage around it. One function preserved by retaining this type of large tree extending across the entire river channel is that it enables animals (such as bobcats) and, potentially, humans, to cross the river without getting their feet wet.



Paddlers poking their way through riverine vegetation in the Ipswich River in Topsfield, MA



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.



Wood debris jam on a fast-moving section of the Quinebaug River in Sturbridge. Here, some judicious pruning of the small branches extending into the right channel should enable boats to safely squeeze through without affecting the beneficial functions of the jam on riverine habitat and morphology.

Field visit to the Swift River on Tuesday, January 10, 2012 with Terry Connolly and Gary Metras of the Pioneer Valley Chapter of Trout Unlimited



Purpose of visit: to evaluate potential problem areas not for paddlers, but for the safety of anglers wading into and along this popular, catch-and-release, fly-fishing-only section of the Swift River, from Route 9 upstream to the discharge from Quabbin Reservoir

As we walked upstream on the trail along the west bank of the Swift, we saw many trees extending into the river (including some that had recently fallen) that did not pose a safety issue for wading anglers.

The three of us frequently and quickly came to consensus about these. Either the tree did not extend completely across the river, enabling wading anglers to merely walk around the tip of the tree (see photo at right), or the fallen tree(s) did not block or constrict the current (i.e. concentrate it into a fast-moving, powerful flow) to such a degree that it created a difficult or potentially hazardous condition for wading anglers.

In the meantime, trees fallen across or into the river were providing beneficial "structure" for fish and other riverine organisms.



Problem Spot #1 - Looking across the river at a spot where several trees fallen across the river pose a potential challenge for wading anglers accustomed to entering the river at this spot.



Proposed Solution: I agreed with Terry and Gary that some action appeared to be warranted at this spot in order to enable anglers to enter the water safely and cross to the other (east) side of the river. I suggested that if the smaller branches in the center of the river (and photo) were trimmed with pruning shears (i.e., the smaller end (like the last 4-5 feet) of the upper branches of the fallen trees on the left side of the photo), that should provide a clear path for the anglers to safely enter and wade across the river.

Problem Spot #2 - At this spot, trees fallen across the river have captured floating branches and leaves, constricting the flow of the river into a fast-moving, powerful flow that is potentially hazardous to wading anglers. That's Terry Connolly on the right and Gary Metras on the left side of the photo.



Potential solution: I suggested here a "light touch" technique that could alleviate the problem: clear out the branches and leaves blocked up under the fallen tree (by, e.g., tying the debris to a rope and then pulling the rope from the bank) - once that's done, the river's flow should no longer be as constricted and concentrated, and it should be safer to wade in this location.



Here a kayaker confronts a “strainer” (a large tree + branches fallen completely across the river). In this situation, it should be OK to judiciously prune a few of the smaller, non-load-bearing branches to enable a boat to squeeze through without adversely affecting the tree’s ecological or other functions and values.



White Pine Tree blocking the entire Squannacook River channel. Here some underneath branches can be trimmed, enabling safe and enjoyable paddling while retaining the scenic “natural arch bridge” of the upper branch and its function for a wildlife river crossing.

Here's another tree that has fallen completely across the river. While the current is a bit quick here, it still looks feasible at this water level for most paddlers to (with a good head start) paddle over this obstacle.



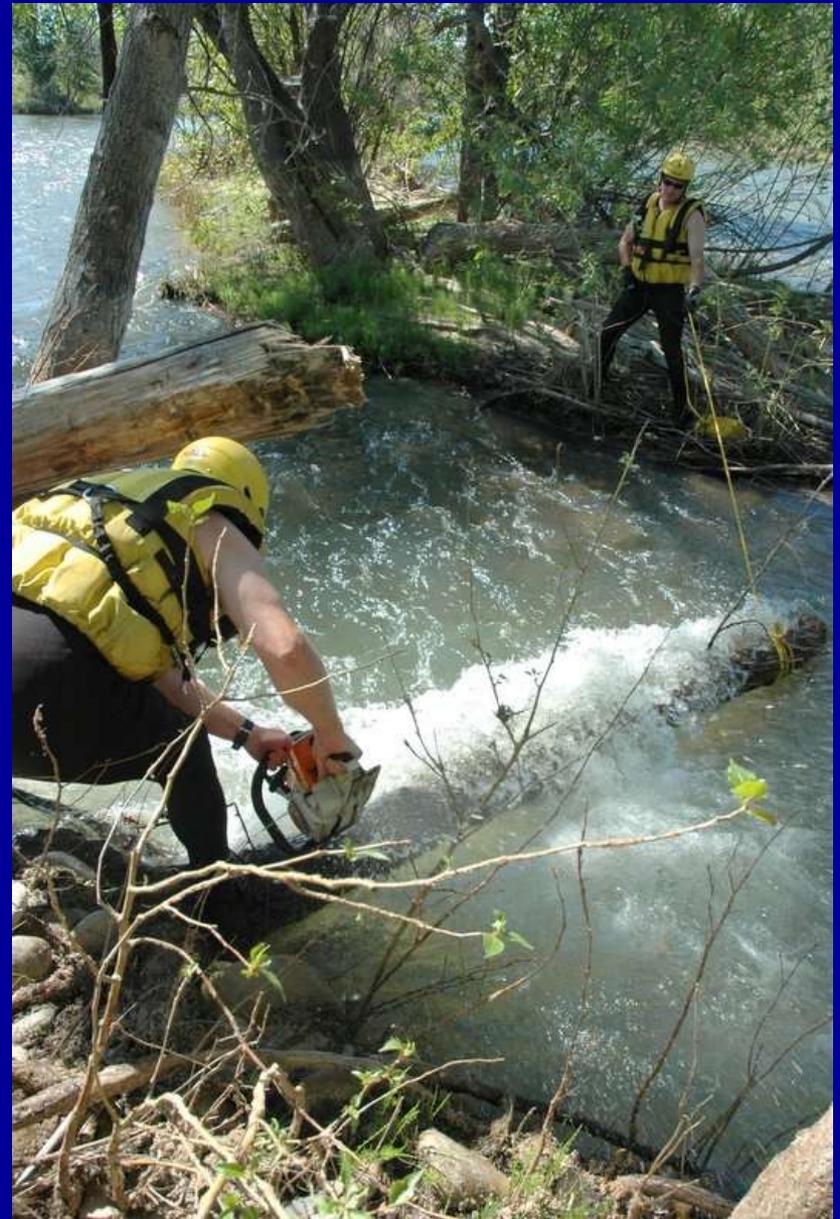


Here's an example where a section of low-hanging tree trunk completely spanning the Squannacook River channel was removed to facilitate safe paddling. This decision was apparently justified, as the log had fallen across a quickwater section of the river, where the faster current could have pinned or flipped a boat hitting the tree trunk. Note that the tree section removed is where the fastest current is.

An example of where a boat has hung up on a “strainer”, a tree fallen across a fast-moving stretch of water. If it is not feasible to paddle or portage around this potentially dangerous obstacle, then a section of the tree might need to be removed to mitigate the hazard



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.



In this case, it appears possible to clear a small gap in the branches extending down from the trunk to create a space for boats to squeeze through without adversely affecting the tree's benefits to the river



In this case, where the tree has fallen across a fast-moving section of stream and may be hard for paddlers to avoid it, a “come-along” (hand-powered cable winch) could be used to relocate the tree so that it no longer blocks the entire channel and to enable boats to squeeze through an opening



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.

I believe this photo was taken on the Nipmuc River (a tributary to the Branch River, which is itself a tributary to the Blackstone). I think the purpose of this photo was not to show someone apparently walking on water but to show how paddlers can help each other lift boats over obstacles (like shallowly-submerged tree branches, in this case).



Here's a situation where several large trees and logs have combined to completely block a fast-moving section of river, and the possibility of a boat being pinned against the wood by the current and possibly flipping is significant, so some action here to reduce the safety hazard seems to be warranted.



East Branch Housatonic River, Pittsfield, April, 2011

Here's a close-up (in side view) of that same logjam. Note the (barely) submerged log in the foreground, which should also be dealt with if that's the section of the logjam that would be cleared to allow safer passage for boats.



As it happens, there was another channel on river left at this location that was free of obstructions, so the logjam on river right could be easily and completely avoided by paddlers (thus no need to clear out any of that logjam).



At this spot, a section of very fast-moving current carried a blue canoe directly into a logjam, where it subsequently flipped over (see arrow), discharging most of its contents, and almost got pulled completely underwater underneath the logjam. Here the trees in the river present a clear safety hazard to paddlers.





Rescuing the canoe from the logjam

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.



Questions?



Paddlers participating in the Fort River Festival 2010, Hadley, MA