TOWN OF HARVARD
CONSERVATION COMMISSION AGENDA
THURSDAY FEBRUARY 16, 2023 @7:00PM

Pursuant to Chapter 107 of the Acts of 2022, An Act Relative to Extending Certain COVID-19 Measures Adopted during the State of Emergency, and signed into law on July 16, 2022, this meeting will be conducted via remote participation. Interested individuals can listen in and participate by phone and/or online by following the link and phone number below.

UpperTH ProWebinar is inviting you to a scheduled Zoom meeting.
Join Zoom Meeting
https://us02web.zoom.us/j/81725416753?pwd=QnhyS0NyVW9mMVRoUVhUVXo0d0JlZz09

Meeting ID: 817 2541 6753
Passcode: 720413
One tap mobile
+19294362866,,81725416753# US (New York)
+13017158592,,81725416753# US (Washington DC)

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+1 929 436 2866 US (New York)
+1 301 715 8592 US (Washington DC)
+1 305 224 1968 US
Meeting ID: 817 2541 6753
Find your local number: https://us02web.zoom.us/u/kdmhPcuITo

New Business:

1. Land Stewardship Subcommittee Update
   - Appoint Jim Gorss – term to expire 7/1/2025
   - Community Preservation Committee Application Update
   - 2023 CISMA Small Grant for Japanese Knotweed
2. Available Training
   - MACC Annual Environmental Conference- February 28 to March 9, 2023 (additional allocation of funds)
   - State Ethics Training – March 14, 2023 6-8pm
   - MMA Webinar – Strategies for facilitating Municipal Meetings
3. Violation of the Order of Conditions – 175 Littleton County Road, DEP#177-694,Harvard#0820-04
4. Annual Appointments – Jaye Waldron, Jim Burns, Mark Shaw & John Iacomini
5. Approve Minutes
6. Approve Invoice

Old Business:

1. Annual Review & Recommended Amendments of the Memorandum of Understanding for Ann Lee Field with Parks & Recreation Commission
2. Proposed Amendments to the Code of the Town of Harvard Chapter 39 Firearms and Explosives to include Hunting and Trapping
3. Climate Action Plan Natural Resources Priority Actions to Implement Update
4. Pine Hill Village Status Update

Public Hearings:

7:30pm **Notice of Intent Hearing –Rainer Park, 7 Peninsula Road, Harvard#0223-01,** for the replacement of a single-family home, removement of excess pavement, replacement septic system, and removal of barn within the 100' wetland buffer zone and 200' of Bare Hill Pond – ***Waiver Request***

NEXT MEETING: MARCH 2, 2023 **AS**

The listing of matters are those reasonably anticipated by the chair which may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may also be brought up for discussion to the extent permitted by law.

TOWN OF HARVARD

VOLUNTEER APPLICATION (12/02/2008)

Thank you for your interest in serving the town of Harvard. Please complete this application to be kept informed of volunteer opportunities and/or to apply for a specific position or fill a vacancy when one occurs. You may be also be contacted based on your stated areas of interest for other opportunities to volunteer. Your application will be kept on file for 3 years.

Date of Application: 2-2-23

Applicant Information:

Name: JAMES GORSS

Address: 99 OLD LITTLETON RD, HARVARD, MA.

Home/Work Phone # 508 561 1904 **Mobile Phone#** 508 561 1904

Email Address: JIMGORSS@GMAIL.COM

Indicate below which Board(s) or Committee(s) are of interest to you:

LAND STEWARDSHIP SUBCOMMITTEE

Have you previously been a member of a Board, Committee or Commission (either in Harvard or elsewhere)? If so, please list the Board name and your approximate dates of service:

SOUTHBOROUGH LAND STEWARDSHIP COMMITTE 2001 - 2021

Do you have any time restrictions? ■ **YES** ☐ **NO**

Are you a registered voter? ■ **YES** ☐ **NO**

Please list your present occupation and employer (you may also attach your résumé or CV)

RETIRED PHOTOGRAPHER

Do you, your spouse, or your employer have any current or potential business relationship with the Town of Harvard that could create a conflict of interest? (If YES, please describe the possible conflict) NO

Please outline any education, special training or other areas of interest you have that may be relevant to the appointment sought.

I CREATED, AND MAINTAINED THE TRAILS AT SOUTHBOROUGHS BREAKNECK HILL CONSERVATION LAND FOR 30+ YEARS.

Received by Town of Harvard 10/11/2017 Processed by jd on

Return to: Town Of Harvard, 13 Ayer Road, Harvard MA 01451 or email jdoucet@harvard.ma.us

SuAsCo Cooperative Invasive Species Management Area (CISMA) REQUEST FOR PROPOSALS

The Steering Committee of the SuAsCo CISMA has received $6,000 from the Sudbury-Assabet-Concord Wild & Scenic River Stewardship Council (RSC) to fund one or more invasive species control projects. We are seeking proposals from CISMA Partner organizations for projects that would directly benefit the Sudbury, Assabet, and/or Concord rivers by either eradicating/managing applicable priority species or by supporting educational outreach efforts. The watershed-wide priority species are listed in Table 1. Projects must occur within the Sudbury-Assabet-Concord (SuAsCo) watershed. The RSC works to protect the resource values of these three rivers, including ecology, scenery, recreation, history and literature. Please describe how your project will help to meet the RSC's objectives. We encourage proposals to include collaboration among multiple landowners, and/or recruiting and training a group of volunteers (or making use of existing volunteers), but these aspects are not required. Projects that directly impact the rivers or associated wetlands will be given priority. If your project does not directly impact one of the rivers or associated wetlands please describe how this work will benefit the watershed.

Using the application below, proposals should include details on project objectives and methods, discussion of how the project relates to the targeted objectives, a project timeline, and a detailed budget. Proposals must include a process for evaluating effectiveness of the control effort and demonstrate a capacity for long-term monitoring and follow-up. Proposals should be no more than two pages plus supporting materials such as maps and letters of support. If funding is awarded the awardee is required to either host a walk or presentation on the work they did.

To apply, email proposals to Kristin O'Brien at kobrien@svtweb.org with the subject "SuAsCo CISMA Grant Application". **Application deadline is 5:00 pm, December 16, 2022**. Grant recipients will be asked to submit a final report by July 15, 2023 (an extension can be requested).
Questions can be directed to Kristin at kobrien@svtweb.org or at 978-443-5588 ext. 135.
To see previously-funded projects go to: https://cisma-suasco.org/projects/ . For more information about the SuAsCo Wild and Scenic River or the RSC, visit http://www.sudbury-assabet-concord.org/.

All applications will be reviewed by the SuAsCo CISMA Steering Committee and announced after January 10th, 2023 Steering Committee meeting. The Steering Committee will strive to allocate funding by consensus. However, if a vote is required, Steering Committee members whose organizations have applied for funding will not be able to participate in discussions and decisions regarding allocation of funds.

Table 1. Watershed-Wide Priority Species

Watershed-wide early detection species	Watershed-wide species of ongoing concern
Amur cork tree	Autumn olive
Black jetbead	Black swallowwort
Brazilian water weed	Burning bush
Callery pear	Bush honeysuckle
Chinese silvergrass	Common reed
Creeping buttercup	Eurasian watermilfoil
European alder	Garlic mustard
Rusty Willow	Glossy Buckthorn
Fig Buttercup	Japanese barberry
Giant hogweed	Japanese knotweed
Hydrilla	Multiflora rose
Japanese stiltgrass	Oriental bittersweet
Kudzu	Purple loosestrife
Mile-a-minute vine	Spotted knapweed
Mugwort	Tree-of-heaven
Narrow-leaf bittercress	Water chestnut
Broad-leaved pepperweed	
Porcelain berry	
Wall lettuce	
Wild Chervil	
Wineberry	

SuAsCo CISMA Project Proposal Application – 2023

Organization Name: **Harvard Conservation Commission**
Land Stewardship Subcommittee

Total Funding Request: $1650.00
Total Project Cost: $1650.00

CISMA Signatory Partner: Yes

Has your organization ever received CISMA Grant Funds: No

Project Name: Suasco Watershed Knotweed Control

Contact person: Wendy Sisson **Title: Chair, Land Stewardship Subcommittee**

Address: Harvard Conservation Commission, 13 Ayer Rd **Town: Harvard**

Email address: mwsisson4@gmail.com **Telephone: 978-660-8181**

Proposal Information : Applications should be no more than 2 pages plus budget. Letters of support and additional pertinent materials may be included, though not required, in the application submittal. Please submit the application and supporting materials in either a text (e.g. Microsoft Word) or PDF file to Kristin O'Brien (kobrien@svtweb.org) with the subject "SuAsCo CISMA Grant Application".

Specific Project Goals:
To control Japanese knotweed on two sites where roadside infestations, initially from culverts, are spreading into streams and wetlands on Town conservation land.

How the Project Meets RSC Goals (described above)

The small streams and extensive wetland (~50 acres) threatened by these stands of knotweed are sources of the Assabet River. These waters join Elizabeth Brook and flow into the Assabet's Delaney flood control system. Knotweed can spread gradually in such areas, or quickly in the event of flooding stormwaters and is notoriously damaging to rivers and their banks. If knotweed is not controlled in upstream systems, it can continually reinfest downstream habitat, so a small project like this can have long term-effects on the ecology of the Assabet River.

Site Description and Context:
The two stands of knotweed are on Massachusetts Ave/ Rt 111 and Stow Rd (areas circled on attached watershed map). They both became established at culverts, have colonized the road verge and are prominently noticeable to drivers. They have spread into conservation land along streams and into wetlands.

Description of Proposed Methods for Invasive Plant Control:

Herbicides labeled for sensitive areas will be applied with backpack sprayer by licensed, experienced professionals. See attached proposal from Vegetation Control Services, Inc., "Combined grant sites…"

Description of how the site will be monitored and evaluated for success:

The sites will be monitored by the Land Stewardship Subcommittee.

If Educational, describe work to be completed and how the project will help educate others:

An important goal of this project is to demonstrate the feasibility of control of knotweed to citizens of Harvard. A parallel initiative of the applicant is a proposal for a town-wide roadside knotweed management program. (See "ConCom letter__SB__Japanese Knotweed…" and "Japanese Knotweed BMPS" attached.) This proposal was well received by the Selectboard, but there was not enough lead time to raise Town funding for 2023. The ability to carry out two small but highly visible control efforts along two major "commuter routes" in 2023 will be significant in demonstrating what can be done and raising awareness while the town decides next year whether to fund and implement a broader program. This program, in addition to knotweed control, includes implementing best management practices to avoid spreading knotweed (and other invasives) in the course of roadwork and other municipal projects.

Who is the target audience for educational materials:

Educational materials would include article(s) in the local *Harvard Press* to inform townspeople.

Grant recipients will be required to provide case study information for the CISMA web site (provide link to the project page of the web site).

a. Description of Program/Project: Identify and explain:
- The goal(s) and need for your project.
- How the project meets the intent of the RSC resource values for the Sudbury, Assabet, or Concord rivers, including ecology, scenery, recreation, history and literature. If your project does not directly impact one of the rivers or associated wetlands please describe how this work will benefit the watershed.
- Identify the target priority invasive species

b. **Specific activities:**
- Concisely list and explain all project tasks and deliverables for each task.
- Include a timeline, arranged by task, indicating start date, date of task completion and submission of deliverable(s) date.

c. **Evaluation:** Please provide details on the evaluation process and matrices that will be used to gauge success (how well project implementation met the anticipated outcomes/goals) and how will this be reported to the CISMA.

d. **Other:** Provide any other information you feel would be relevant and not covered above.

e. **Budget:** Complete the following budget table, (add additional tasks if needed).

Task	Funding		Explanation of Expenses (personnel, supplies, printing, equipment, other – please detail)
	CISMA funding	$1650	Payment to invasive management contractor
	Grants (indicate if pending)	$0	
	In-kind	$600	20 hours of volunteer time to plan, permit, supervise and evaluate work.
	Other:	$0	Educational article in local paper

TOTALS: CISMA $1650 Grants $0 In-Kind $600 Other $0

Budget Narrative: Provide additional clarifying information about the project budget. Applicants are encouraged to provide the CISMA with a prioritized list of project tasks. This will help inform decisions should the CISMA opt to fund only select project tasks.

This project is simple in that it requires hiring of a contractor to do the work and the efficacy of the work itself is the educational component. The work will be done on one day, probably in August, so would require an extension of the July 15, 2023 deadline. Follow-up will be conducted as part of the Town's ongoing invasive program and under the Town's roadside knotweed program if that is implemented. When asked about treating one of the two sites in the event funding can not support both, the contractor did not respond. I believe the expense of mobilizing makes a few hours of work uneconomical for this company and since an experienced, professional applicator is desired for this job, if the project could not be funded in full by SuAsCo CISMA, additional funding would be required.

Attachements:
Harvard Watersheds map
Combined grant sites – VMS proposal
Concom letter –Town roadside knotweed program
Japanese Knotweed BMPs

Harvard, MA: Wetlands & Watersheds

SHIRLEY
AYER
LITTLETON
LANCASTER
BOLTON
BOXBOROUGH
STOW

Nashua River
Bowers Brook
Cold Spring Brook
Flannagan Pond
Sandy Pond
Plow Shop Pond
Grove Pond
Robbins Pond
Mirror Lake
Bare Hill Pond
Eldridge Pond
Delaney Pond
Horse Meadows Reservoir
Merrimack River Watershed
Nashua River Watershed
SuAsCo Watershed
Still River
Elizabeth Brook
Bennetts Brook

Legend

Major Basins & Watersheds
- Merrimack
- Nashua
- Sudbury/Assabet/Concord

Drainage Sub-Basins
- Merrimack
- Nashua
- SuAsCo

Water
- Streams & Rivers
- Lakes, Ponds & Reservoirs
- Wetlands
- 30 foot Contours
- Devens Boundary
- Community Boundaries
- Active Rail Lines

Roadways
- Interstate Routes
- US & State Routes
- Other Roads

FEMA Flood Zones
- 100 Year
- 500 Year

0 0.4 0.8 1.6 Miles

Funding provided by the Nashua, Squannacook, and Nissitissit Rivers Wild & Scenic Stewardship Council through the National Park Service under CFDA: 15.962 – National Wild and Scenic Rivers System.

DATA SOURCES: MassGIS, MassDOT, FEMA, USGS, the Town of Harvard and the MRPC.

DISCLAIMER: The information depicted on this map is for planning purposes only. All data are representational and are not adequate for boundary definition, regulatory interpretation, or parcel-based analysis.

PREPARED BY:
Montachusett Regional Planning Commission
GIS Department, September 2022
464 Abbott Avenue
Leominster, MA 01453
Phone: 978-345-7376
E-mail: mrpc@mrpc.org

Montachusett Regional Planning Commission
Established 1964
Commonwealth of Massachusetts

/Harvard/Harvard_Watersheds_2022/Harvard_Watersheds_hatchedWetlandsDarkerColors_11x17P.mxd [1:37,000] 09_23_22

Vegetation Control Service, Inc.
2342 Main St.
Athol, MA 01331
(978) 249-5348
fax: (978) 249-4784

ESTIMATE & AGREEMENT

Date: Nov 30, 2022

To:	Bid:
Margaret (Wendy) Sisson Harvard Conservation Commission Town Hall 13 Ayer Road Harvard, MA 01451 Mwsisson4@gmail.com	We hereby propose to furnish materials and labor to complete the work outlined herein for the sum of: (See Below). Payment to be made as follows: Net 30 Days

We hereby submit specifications and bid for:

Gravel Pit/ Stow Road Knotweed Site

Project Description: This site is a critical area alongside Stow Road across from house number 145 Stow Road. The infestation of knotweed lies between Stow Road and a large wetland area, presenting a high likelihood of continued spread both into the wetland, and along the road, due to mowing operations. The edges of the wetland bounding the road and along the road that leads to the town gravel pit area, is relatively heavily impacted by both woody and herbaceous invasives, but for the purposes of this particular project, the application will be limited to the small Japanese Knotweed sites immediately adjacent to the road and the entry to the gravel pit, and their extent into the edges of the wetland. Any Bittersweet, Honeysuckle, Multiflora Rose and other invasives within the limits of the Knotweed treatment area, will also be targeted as time allows.

Route 111 Site

Project Description: This site is a relatively contained area alongside route 111 between its junctions with Stow Rd. and Woodchuck Hill Rd. The main species on site and of primary concern is the Japanese Knotweed that is centered on a culvert under the road allowing the passage of a small brook. Knotweed is present on both sides of the road, and likely came in with construction activities on the culvert at some time in the past. The infestation has been spread along the road, probably through mowing and plowing activities, but spread is also occurring downstream along the brook banks. This infestation is fairly small and localized and should be readily controllable. Unfortunately, at this time, the Conservation Commission only has the authority to treat on the Harvard Conservation property on the South side of the road, reinfestation from the Right of Way and the private property on the North side of the road is likely unless that, upslope portion of the infestation is also addressed in the near future.

The initial treatment for these two sites should only require about one day for one senior certified applicator to complete. Herbicide selection will be strictly limited to materials allowed under the Massachusetts list of materials to be used in Sensitive Areas otherwise known as the Sensitive Materials List. Permitted applications to the edge of water will be limited to Rodeo aquatically labelled glyphosate herbicide alone. In either case, application will be performed selectively, with a backpack sprayer, to minimize runoff and off-target application.

Price: $1650.00
Including time and materials

CONTRACTOR'S GUARANTEE

We guarantee all materials used in this contract to be as specified above and the entire job to be done in a neat, professional manner. Any variations from plan or alterations requiring extra labor or material will be performed only upon written order and billed in addition to the sum covered by this contract. Verbal agreements made with our workmen are not recognized.

Date: Signed:
Andrew Priestley, Veg. Mgmt. Specialist

ACCEPTANCE OF BID

The above specifications, terms and contract are satisfactory, and (I)(we) hereby authorize the performance of this work.

Date:

Signed:

WE COMPLY WITH ALL WORKMAN'S COMPENSATION & PROPERTY DAMAGE LIABILITY INSURANCE LAWS.

OFFICE OF THE
CONSERVATION COMMISSION
13 AYER ROAD HARVARD, MA 01451 978-456-4100 EXT.321 www.harvard-ma.gov

July 19, 2022

Harvard Select Board
13 Ayer Road
Harvard, MA 01451

Re: Japanese knotweed

Dear Board members,

We have all become aware of the fast-growing invasive Japanese knotweed on the sides of our roads. At this point it is no longer in a handful of sites but progressively occupying sites all over Town. It is a problem for the Department of Public Works (DPW) because it impedes sightlines along roads which can be a safety hazard. It is also an ecological hazard because it is spreading from roadsides and culverts into wetlands where it can dominate and push out established native vegetation. Japanese knotweed, which is particularly rampant in the northeastern United States and Canada, has become a scourge around the globe and reports on its economic impact by devaluing property (its roots can penetrate concrete) are impressive. According to a 2019 report, Britain spends $250 million annually on control and Europe 5 billion Euros. Like other invasives, it flourishes after disturbance of soil which is why it is seen on construction sites and along roadways. It is commonly introduced through fill and equipment and then spreads by seed and vegetatively, growing from intact and broken pieces of stout rhizomes. It grows quickly up to 13 feet and can tolerate sun, shade, high temperatures, road salt, drought and flooding.

Japanese knotweed it notoriously hard to control, unless mowed weekly like a lawn. However, mowing periodically actually spreads the plant, as it reaches out with its underground rhizomes in response to being cut. Except for individual new plants, digging is also ineffective, as the plant can grow from broken pieces of rhizome and huge craters would be left after removing sufficient soil. Disposal of plant material and associated soil is another significant problem. Smothering with wire mesh or heavy plastic can be accomplished with persistent effort on small areas but is not feasible along roadways.

The Conservation Commission has been struggling with stands of Japanese knotweed on Conservation land for the past ten years and has learned that control requires a concerted effort and annual attention. The most effective method is early-season mowing followed by focused herbicide treatment at the time of flowering in August. Professionals have various techniques to administer herbicide to the plant in a controlled fashion without affecting adjacent vegetation and in sensitive sites. Biocontrol is being actively pursued and after years of research and testing, the release of a sap-sucking psyllid, A itadori, was approved for release in the US in 2020. This insect, native to Japan, has been previously introduced in the United Kingdom and Canada, but has failed to establish large enough populations to affect Japanese knotweed there.

Given this current situation, the vocal concern of townspeople, and the potential now of slowing the spread Japanese knotweed in Harvard before it is over-run, the Conservation Commission recommends that a program be developed to reduce the spread of Japanese knotweed and to control existing stands

along our roadways. In addition to education of Town staff and the public and potential local regulation to slow the spread resulting from current practices, the Commission suggests that under DPW leadership, a company be engaged to develop and implement a roadside treatment plan for Japanese knotweed in Harvard. There are large businesses with years of experience and trained crews that specialize in this work.

Without changing practices and controlling existing stands the situation will become worse, as it has throughout the region, with more impacts and increasing expense to address. Besides spreading from town-controlled land -- our roadsides -- to private property where it is damaging, it will also further degrade town resources like wetlands (including fire ponds), waterways and town lands which each provide services to residents. Waterways are particularly vulnerable and culverts can become choked with knotweed during flooding events as has been noted in our climate change hazard mitigation plan. State funds will be available to address this and perhaps other impacts. Because the expense and difficulty of control will continue to increase each year, we ask that the Selectboard commit to develop a plan in the current fiscal year so by this time next year we can be starting to address knotweed in Harvard.

On behalf of the Commission,

Don Ritchie

Don Ritchie,
Chair

Cc: Department of Public Works
File

Preventing the Spread of

Japanese knotweed

Reynoutria japonica

(AKA: *Fallopia japonica, Polygonum cuspidatum*)

Best Management Practices

New Hampshire Department of Agriculture,
Markets & Food
2018

Prepared by: Douglas Cygan

Table of Contents Page

Purpose statement:
Japanese knotweed is an aggressive invasive plant species that is becoming more widespread in the state of New Hampshire and the northeast. Because it can be spread vegetatively, the probability of moving Japanese knotweed during routine maintenance and in fill material associated with construction activities is increasing across the state, leaving municipalities and landowners with the costs associated with remediation of this destructive weed. Because of this, it is worthwhile to consider how to address Japanese knotweed movement prior to maintenance activities and during the planning phase of construction projects, rather than mitigating the damage post-construction. These BMPs will help you to understand the risks associated with Japanese knotweed; how Japanese knotweed is moved, both naturally and as a part of maintenance and construction activities; identify some basic critical control points to reduce the movement of Japanese knotweed; and provide some Integrated Pest Management (IPM) based control methods for Japanese knotweed.


Japanese knotweed in flower

Regulatory statement:
Japanese knotweed is a listed prohibited invasive species in the State of New Hampshire, and as such: "no person shall collect, transport, import, export, move, buy, sell, distribute, propagate or transplant any living and viable portion of any plant species, which includes all of their cultivars and varieties" (Agr 3802.01(b)). Transportation of Japanese knotweed in fill is a violation of these rules, and the NH Department of Agriculture, Markets & Food (DAMF) has enforcement authority of these rules. However, a regulatory response is only initiated *after* the knotweed has been moved and a resulting violation confirmed.

A strictly regulatory response to violations is not the most effective way to manage for Japanese knotweed. Effective management involves including best management practices as part of your overall plan – including ensuring that clean fill is used, vehicles are cleaned, and properties are inspected periodically throughout the process. This manual should help you to achieve these goals.

Who should use this manual:
This manual is intended to provide management strategies for developers, site managers, contractors, utility companies, sand & gravel operations, highway/roadway maintenance crews, landscapers, property owners and others working on projects where Japanese knotweed occurs. It is intended to reduce the risk of spreading Japanese knotweed by providing effective on-site management practices.

What is Japanese knotweed:
Japanese knotweed (*Reynoutria japonica* also known as *Fallopia japonica* and *Polygonum cuspidatum*) is an aggressive and highly invasive herbaceous to somewhat woody perennial originating from eastern Asia (Japan, Korea, China and Taiwan). Japanese knotweed is very similar to two other closely related invasive knotweeds found in New Hampshire: giant knotweed (*Reynoutria sachalinensis*) and Bohemia knotweed (*Reynoutria* ×*bohemica* [*R. japonica x R.*

sachalinensis]. All three knotweeds should be managed following the practices described in this manual. Japanese knotweed is one of the 1,200 species found in the buckwheat / knotweed family (Polygonaceae). One of the family characteristics that this plant has are noticeably jointed stems leading many people to believe Japanese knotweed is actually a bamboo. It was first brought to the United States in the late 1800's for ornamental and horticultural purposes. It quickly became popular in the nursery trade and has been planted in landscapes throughout North America. It was also planted for erosion control and as a forage crop; little did they know at the time how damaging these practices would be.

Invasive characteristics of Japanese knotweed:

- Fast growing, ~ 8" per day
- Large woody rhizomes that penetrate the ground up to 10' deep and laterally can exceed 40'
- Allelopathic properties (*chemical compounds that are released by certain plants to eliminate vegetative competition*) allowing it to displace native vegetation
- Forms dense clonal communities
- Regenerates from rhizome fragments as small as ½" in length
- Rhizomes can remain dormant for up to 20-years
- Cut or mowed stem fragments can regenerate from nodes
- Outcompetes native species and reduces or eliminates native plant diversity
- Grows through concrete and pavement causing issues with infrastructure, utilities, drainage, septic systems, walls, and foundations

Movement and dispersal:

Construction/Earth Moving activities are one of the leading causes of Japanese knotweed spreading throughout the state. Small ½" fragments of its rhizomes can survive long periods of time in a dormant state and regenerate when conditions allow, which is why it is imperative to scout for and manage Japanese knotweed prior to moving any earthen materials both on and off site. The most common cause of spread is the result of construction activities in areas where Japanese knotweed occurs such as, routine maintenance of roadway drainage channels, slope work, or site-work involving excavation. Screening earthen material containing knotweed rhizomes often results in the rhizomes being chopped into numerous viable propagules waiting to regenerate.

Mowing/Cutting can result in the spread of Japanese knotweed under certain conditions. Mowed/cut stems/fragments with nodes/joints have the ability to develop adventitious roots and shoots if they come in contact with moist soils or water. This occurs when clods of mowed/cut knotweed stems accumulate on equipment and eventually drop off. Larger stem pieces usually have sufficient moisture reserves to retain their viability whereas mowed/chewed up step fragments are less likely to regenerate on their own.

Mowing/cutting does nothing to manage or reduce knotweed populations. In fact, these types of impacts typically break dormancy of lateral buds along the rhizomes thus expanding the outer limits of the population. Mowing/cutting should only be done if safety is an issue and the equipment is

cleaned before moving off site. If mowing/cutting is required, then foliar herbicide treatments or smothering should be integrated as part of the management effort.

Pathways for introduction of Japanese knotweed:

Vector	Notes	Long Distance
Construction - residential/commercial	Excavation of earthen material	Yes
Roadway – construction/maintenance	Excavation of earthen material	Yes
Machinery/equipment	Tracks, tire treads, soil clods	Yes
Rivers - flowing water/flooding	Scour damage, uprooting	Yes
Collecting - specimens	Hedge/fence row/specimen	Yes
Mowing – viable stem fragments	Stem fragments, mower decks	Yes

Japanese knotweed impacts:

***Structural*:**

When Japanese knotweed occurs adjacent to man-made structures such as bridge abutments, roads, sidewalks, parking lots, and foundations, the rhizome can damage and even weaken their structural integrity as the rhizome system expands in size. As the rhizome increases in diameter, upward pressure is exerted, which can split structures at their weakest points. The rhizomes can also damage subsurface drainage, underground conduits, septic systems, etc.

Environmental:

Japanese knotweed can spread very quickly and forms dense colonies that out-compete native vegetation by blocking sunlight, releasing chemicals (allelopathic) from its rhizome that suppress plant growth and germination, and robbing nutrients and water from the soil. In floodplain and shoreline habitats, knotweed is moved by flowing water during flooding and ice flow events. Whole or partial Japanese knotweed plants are carried downstream and take hold to form new populations. The Baker River is one of New Hampshire's river systems being choked by knotweed. Increases in Japanese knotweed populations within riverine systems can impede water flow and lead to increased risk of flooding.

The Baker River in Rumney, NH, just one of the many areas along this resource choked by Japanese knotweed

Reproduction by seed is not typically an issue that warrants the same precautionary measures as with vegetative propagules. Although seeds can and do germinate, they rarely survive. Seeds and seedlings tend to be fed on by small mammals, injured by frost, or fail to develop due to dry soil conditions and/or lack of sunlight.

The low risk of Japanese knotweed establishing via seed (sexual reproduction) clearly indicates that human actives are a primary cause for its spread and establishment on embankments and floodplains associated with surface waters and wetlands. The source of reproductive material for these areas usually originates from Japanese knotweed growing within the watershed, which was brought there in fill material for commercial / residential development and/or road construction / maintenance. Human activities and/or sheet flow runoff can transport living and viable propagules into surface waters and adjacent habitats where they take root. Because there is a close relationship between human activities and the spread of Japanese knotweed, due diligence can significantly reduce the spread, as well as the economic and environmental costs of Japanese knotweed.

Community:
Japanese knotweed has very few aesthetic qualities that make it a desirable landscape plant, especially as the aboveground portion of the plant dies off leaving dead persistent stalks from late fall to spring. In unmaintained areas and natural habitats, these dead-brown stalks remain standing for up to 5-years. In urban environments, debris and trash tend to accumulate in Japanese knotweed thickets and, in some cases rat/rodent populations increase. Japanese knotweed stands also provide discrete locations for drug use and other illicit activities. All of these factors diminish intrinsic and monetary values of communities, personal property, and natural landscapes.

Economic:
The presence of Japanese knotweed in any location whether in development/construction sites, occurring along roadways, adjacent to homes or buildings or choking rivers and waterways all cause economic impacts. These impacts are difficult to quantify, but are attributed to structural damage/failure, safety concerns for motorists, flooding damage, and loss of important habitats.

According to 2016 cost estimates from the Rockingham County Conservation District (RCCD), the typical cost to manage knotweed using a glyphosate based product is approximately $500/acre for the initial treatment. A follow up second year treatment costs approximately $300/acre and if treatments for a third and subsequent years are necessary, the cost is around $200/acre/per year. These cost figures do not include site remediation, removal of vegetative growth, soil stabilization or revegetation.

Identification of Japanese knotweed:
Japanese knotweed grows to a height of 10’ with a spreading habit of approximately 5’. When mature, the greenish stems with purple splotches grow to 1 inch in diameter and are hollow with segmented joints. The joints, where reproductive nodes form, have a characteristic tannish papery sheath, typical of plants in the buckwheat family. After the first killing frost in the fall, the entire aboveground portion of the plant dies off and turns brown. The stalks remain persistent throughout the winter and into the spring. Emergence from winter dormancy begins in April. The young shoots resemble those of asparagus and are sometimes collected for culinary purposes. Its rapid growth rate allows it to attain 8” in height per day.

Leaves are 4-7” long by 3-4” wide and arranged alternately along the zigzagged stems and branches. The leaf petioles arise from the nodes. The leaves themselves are semi-triangular in shape with smooth margins and a flat truncate base. One of the aspects of Japanese knotweed that allows it to outcompete native species is that the foliage density creates a thick canopy that significantly reduces light levels to the ground below.

Stems are upright, tall-10', greenish with purple splotches, hollow between raised nodes, profusely branched, and grow to 1" in diameter.

Rhizomes are horizontal underground stems that have a high capacity for storing carbohydrates for growth and overwintering. The rhizome accounts for 2/3 of the plant's entire mass and can travel up to 20' horizontally with some accounts of up to 60', and go 6-10' deep. Rhizomes have a dark brown exterior and a bright orange interior. Perennating buds found on the crown and along the rhizomes will also react to shoot damage, i.e., mowing/cutting, by sending up additional shoots along the rhizome. This typically results in radial/clonal spread of the plant and increases its shoot density. These latent buds also allow rhizome fragments, as small as ½" long, to regenerate into new plants when severed. This can occur from ice flows along waterways or by construction activities involving excavation where Japanese knotweed occurs. Evidence also shows that Japanese knotweed releases chemicals into the soil in the form of alleliopaths for the purpose of eliminating competition.

Flowering begins in mid-August and lasts for about 3-weeks. The flowers are small, whitish-green and form dense clusters, called panicles, from the leaf axils. The flowers are pollinated by insects, primarily honeybees and other types of bees. *Because of issues with honeybee and native bee decline, any attempt at using chemical control should be delayed until after flowering and honeybees and other pollinators are no longer present*.

Japanese knotweed is a dioecious type plant, meaning there are both male and female plants. Although it is typically thought that Japanese knotweed seeds are sterile, an anecdotal study conducted by the DAMF found a germination rate of 95% for seeds collected throughout New Hampshire. This anecdotal evidence shows that it can be spread from seed and not just rhizome and stem fragments. Several factors may limit the seeds' ability to become fully mature including competition, dry or wet conditions, shade, predation and frost damage. Examination of where Japanese knotweed occurs clearly demonstrates an association with disturbance events rather than seed dispersal. The seeds that form immediately after flowering are contained in a 3-wing calyx that can be carried in the wind or by water.

What to look for:

- fleshy red tinged shoots when breaking through the ground
- large, heart or spade-shaped green leaves
- leaves arranged in a zig-zag pattern along the stem
- a hollow stem, like bamboo
- dense clumps that can be several meters deep
- clusters of cream flowers towards mid-August that attract bees
- die back between September and November, leaving brown stems

Japanese knotweed flowers

Pre-construction considerations:

1. Survey the site for the presence of Japanese knotweed prior to buying or commencing work.
    a. Learn how to identify Japanese knotweed, and other invasive plants.
    b. If site has been disturbed / cleared, look for emerging shoots poking through the soil.
    c. Look at aerial imagery (Google Earth, Bing Maps or other program) to search for possible presence of Japanese knotweed.
    d. If Japanese knotweed does occur, determine feasibility and prudency for management.
2. Timeframe for treatment and development
    a. Develop management plans that will meet the timeframe of the project.
    b. Initiate herbicide treatments or smothering within the necessary timeframe (3-5 years) to ensure success.
3. Management of treated material
    a. Herbicide treatments are often not successful the first time and require retreatment. Plan accordingly and if the material is needed only use it in locations where further treatments can occur.
4. Keep all material on-site, if possible. If this is not possible, ensure that it will be going to a location where it can be monitored and corrective action taken if needed.

Management guidelines:

1. Provide identification training for employees and contractors involved with scouting or performing vegetation management
2. Prior to initiating any project conduct a site visit to scout for and locate Japanese knotweed. This step is critical. It is worth the time to do a thorough job. Plot infestations on plans to make personnel aware of their locations.
3. Consider which management method is most appropriate for the scale of the knotweed population - herbicide treatments or smothering.
4. Plan activities to eradicate the Japanese knotweed prior to commencement of work. If herbicides are used, then the application needs to be done within the timeframe outlined on the pesticide label.
5. Avoid working in areas where Japanese knotweed occurs.
6. Do not reuse soils containing Japanese knotweed plant parts/propagules. If soil associated with Japanese knotweed needs to be excavated and moved, then stockpile the material on-site.
7. If on-site fill piles already have Japanese knotweed, treat chemically or smother.
8. Do not bring Japanese knotweed infested soils to the site. If soil is required from off-site sources, inspect the source, site, and material prior to purchase. If Japanese knotweed is found on piled material, inform the company of the regulations regarding the movement of Japanese knotweed.
9. Maintain a 20’ buffer beyond the aboveground portion of the Japanese knotweed to prevent excavating rhizome fragments.
10. Prior to moving equipment out of an infested area, inspect and clean by removing all soils, seeds and/or plant parts. This can be done manually or by pressure washing. Avoid washing oils and greases from equipment to reduce risk of contamination.
11. Stabilize and revegetate disturbed soils as soon as possible.
12. Use non-invasive cover crops or native seed for revegetation.
13. Monitor the site to ensure that control methods were effective.
14. Do not move soils containing living and viable propagules off-site unless for proper treatment/disposal.
15. Periodically inspect the project to determine if Japanese knotweed fragments are beginning to establish.

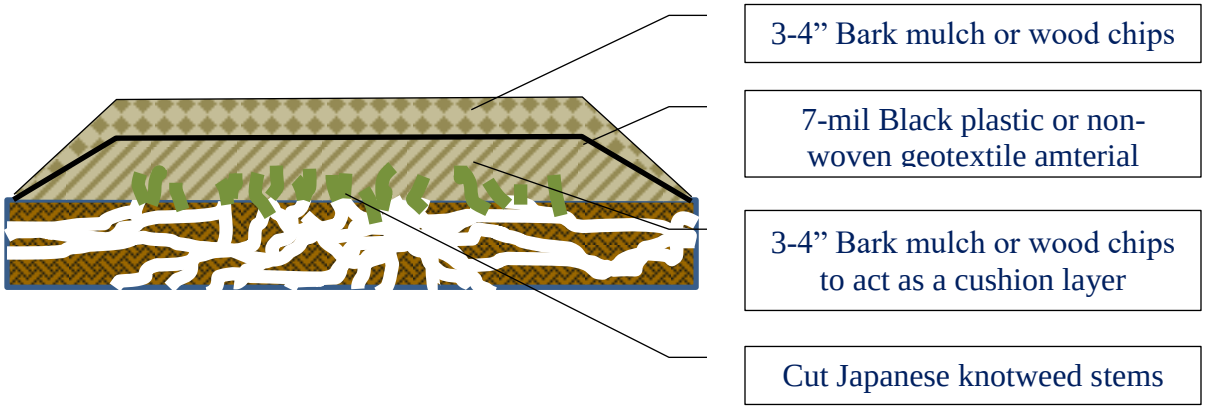
16. Conduct an inspection at the completion of the project to ensure that Japanese knotweed plants have not established. If they have, meet with the project management team to determine a response.
17. Consider including a clause in contracts requiring inspection of the project site one year after completion to address any discovered Japanese knotweed stands resulting from the construction activities.

Methods to control Japanese knotweed:
The following methods detail several options available for the management / eradication of Japanese knotweed plants, and knotweed infested soil both on-site and off-site. The methods are based on Integrated Pest Management (IPM), which is based on mechanical, cultural, biological and chemical controls.

Mechanical:
Mowing/Cutting alone will not eradicate Japanese knotweed and, therefore, should only be used in combination with herbicide applications or smothering. Cutting the aboveground portion of the plant usually stimulates dormant lateral buds along the rhizome system, which then send up new shoots further away from the crown, essentially increasing the total number of stems and extending the limits of the stand. This can have a serious impact to buildings and roadway infrastructure. The cut portion of the Japanese knotweed can be left in place and allowed to dry in the sun. Once the cut stems turn tan to brown in color they are no longer a threat. If freshly cut portions of the plant are moved to another location, ensure they do not come in contact with moist soil, wetlands or surface waters where they can regenerate.

Hand pulling or digging should be limited to new populations that came in with soil containing propagules of Japanese knotweed or small young populations where only a handful of stalks occur. New occurrences in construction sites or work areas can easily be removed by grasping onto the emerging stalks and pulling. If they resist then using a shovel or spade dig adjacent to the stalk to access the rhizome. Ensure that all dug plant material is destroyed before disposing of elsewhere. If herbicide was used as a control method, it's possible that it may take 3-5 years to determine if the management was 100% successful

Smothering is a very effective alternative if you wish to avoid the use of herbicides. Not only does it eliminate the need for chemicals, but there are also no soil disturbance/erosion issues. Here are the general guidelines:



1. Allow the knotweed to grow in the spring without attempting to control it;
2. Cut the knotweed at the base and close to the ground around the first week in June (allowing for early rapid growth causes the plant to exhaust the stored carbohydrates thus weakening the rhizome system);

3. Pile all of the stems on an impervious surface such as a tarp, plastic, pavement, etc. so they can dry (after turning brown the stems are no longer viable or a threat);
4. Spread an adequate layer of mulch, grass clipping or other material over the cut stems to prevent them from puncturing the tarp or plastic, which will be applied in the next step;
5. Cover the entire area with the biggest heavy-duty dark colored tarp you can find, or use large sheets of thick (7-mill or thicker) black plastic. If more than one tarp or sheet of plastic is used make sure to have a wide overlap of 2' between sheets to prevent sunlight from penetrating. Also, make sure the cover material extends a few feet beyond the limit of knotweed in all directions;
6. Weight the top of the tarp/plastic and seal the edges with rocks, sticks, soil, sand, mulch, etc. Do not puncture the tarp/plastic as this can allow knotweed stems to survive. If any tears or holes develop, patch them.
7. If aesthetics is an issue, the tarp/plastic can be covered with attractive bark mulch or other material. If it's on a steep slope some method of anchoring will be required to ensure the mulch doesn't slide off into the surface water. Mulch also protects the plastic from UV photo-degradation.
8. After 5 years the covering material can be removed and the area replanted. If the area falls under the Comprehensive Shoreland Protection Act (CSPA) then approved plants must be used.

   Although this method is time consuming it has been very successful for use in sensitive areas here in NH.

Cultural:
Cultural control involves the alteration to the environment to make it inhospitable for the invasive plant to grow. Unfortunately, Japanese knotweed is highly adaptable to most environments and conditions and cultural controls are not an option. Japanese knotweed grows in soil pH levels ranging from 3.0 to 8.5, it tolerates wet soils, dry soils, and dappled shade. Controlled burning and grazing are also not effective as only the upper portion of the plant is affected and the rhizome system remains intact.

Biological:
Biological control of Japanese knotweed is currently unavailable (as of 2016). However, research is underway to evaluate a leaf-eating insect imported from Japan called a *psyllid*. The *psyllid* was found on knotweed growing wild in Japan and is undergoing host specifity tests with the USDA. The New Hampshire Department of Agriculture, Markets & Food (DAMF) will continue to monitor the status of its availability in hopes that it will soon be viable option for control.

Chemical:
Chemical control can be very effective for managing Japanese knotweed, but can only be done by a NH licensed herbicide applicator or by property owners on their land. Special permits issued by the DAMF Pesticide Control Division may be required so plan accordingly and allow sufficient time for application processing.

Understanding Japanese knotweed physiology will greatly improve the success of chemical control measures. Japanese knotweed is unlike most plants in that the flow of nutrients/carbohydrates is in one direction. Nutrients/carbohydrates move upward during the growing season until flowering and then the process reverses to deliver the nutrients/carbs back down to the rhizome system for overwintering. Therefore, time the application so it occurs just after flowering up until the first killing frost (September – November). This greatly improves the efficacy of the treatment (*early season applications will have little effect on the plant other*

than foliage burn). **Another reason for waiting until after flowering is to avoid impacts to foraging honeybees and other pollinators**. Understanding the timing for chemical control is the key to success.

Herbicides containing the active ingredient (a.i.) glyphosate have been very effectively applied as a 2.5% solution foliar spray. Glyphosate bonds with the carbohydrates and is translocated throughout the rhizome system to kill the plant. In addition, a non-ionic surfactant / spreader / sticker should be used.

A strategy to increase efficacy of chemical control is to cut and remove the aboveground portion of the Japanese knotweed in early June, allowing the stalks to regenerate before treating. Cutting the aboveground portion of the plant automatically stimulates regrowth. This process requires energy stored in the rhizome to be used for new shoot development and thus weakens the rhizome system. Apply the chemical treatment as described above. An added benefit to doing a pretreatment cutting is that the shoots will be shorter at the time of treatment. Typically knotweed grows to 10' tall whereas the regrowth from cutting is usually about half the height, making it easier to access and confirm treatment coverage.

The use of herbicides does not guarantee complete success, and follow-up applications will likely be required for up to 3-5 years. Although 100% control has also been achieved, the average success rate is around 85% after the first treatment. If any viable Japanese knotweed plants survive they will continue to grow, spread and repopulate the site in a matter of years. Japanese knotweed has the ability to remain dormant for many years so even when the site looks to be free of it, it may just be waiting. Long-term monitoring and management is recommended.

Tech Tip

Thorough surveys and early planning efforts will increase the likelihood of success.

Disposal of Japanese knotweed:

- Japanese knotweed crowns and rhizomes can be disposed of by burning/incinerating, burying (>5' below ground), chipping, or sending to a landfill that will accept it. They cannot be stockpiled near wetland or surface waters unless they have been killed by herbicide or heat treatments. Composting crowns and rhizomes is **not** recommended.
- Brown dead stalks of Japanese knotweed can be composted. If the stems are freshly cut then they pose a risk of spreading and need to be dry before composting.
- Never dispose of Japanese knotweed into wetlands, surface waters or in areas with moist soil as the stems may take root.

Utilization of soil containing treated Japanese knotweed rhizomes:

Often the soil from an area with Japanese knotweed populations is needed elsewhere on a project or needs to be taken offsite. By the State's administrative invasive species rules, this can only be done if the Japanese knotweed propagules are non-living or non-viable, in other words, if the risk has been limited by treatment.

Although moving this soil it is not recommended as this could potentially spread surviving rhizome fragments, there are BMP's that can be used to reduce movement, including:

On-site:
Ensure that all of the Japanese knotweed plants have been treated using appropriate herbicides. Allow the herbicide to work and translocate throughout the plant to the point where the leaves become symptomatic / turn yellow. Soil material can then be excavated and moved wherever it is needed. Keep in mind that any remaining viable rhizome fragments can and probably will regenerate. It is your responsibility to ensure this does not happen, and if it does, it is your responsibility to remediate the issue to avoid a possible violation.

Off-site:
The DAMF recognizes that retention of soil materials on site is not always an option, e.g., in roadway maintenance projects or sand & gravel operations. If soil needs to be moved elsewhere, then actions need to be taken to ensure that any remaining viable Japanese knotweed propagules do not become established at their final destination. Any Japanese knotweed that survives needs to be controlled to prevent any possible violations. Deposition sites should not be adjacent to or in close proximity to wetlands, surface waters or sensitive habitats.

Other resources:

Japanese knotweed / invasive species reporting system:
Populations of Japanese knotweed and other invasive species can be reported, by you, directly into the free mapping database program EDDMapS (www.eddmaps.org). This program maps the locations of known invasive species populations nationwide that can be used to determine potential problem areas or help track newly detected invasive species outbreaks for Early Detection & Rapid Response measures. EDDMapS can be accessed via their website, or by using the *Outsmart Invasives* smartphone app. This app automatically records the coordinates for the plant(s). The user must include a clear photo for verification purposes. Although the app includes numerous other data entry fields, they are not required since invasive populations are dynamic changing from year to year. Once the report is submitted it then goes to the approved verifier for the state and released if approved. The photo(s) and information are then available to anyone to view. The information EDDMapS provides can be a valuable resource for anyone involved with early planning and development stages for all types of development / construction.

New Hampshire Department of Agriculture, Markets & Food:
Available on the DAMF website (http://agriculture.nh.gov/divisions/plant-industry/invasive-plants.htm) are numerous invasive species fact sheets, control/management guidelines, and possible funding sources for non-commercial invasive plant control initiatives.

For additional information and guidance regarding Japanese knotweed and/or other invasive species, contact:

Douglas Cygan, Invasive Species Coordinator
New Hampshire Department of Agriculture, Markets & Food,
29 Hazen Drive
Concord, NH 03301
(603) 271-3488
Douglas.cygan@agr.nh.gov

Japanese knotweed Identifying Photos

Mature flowering Japanese knotweed cluster

Alternately arranged leaves on zig-zag stem

Jointed/segmented stem

Crown/rhizome

Underground rhizome structure

Japanese knotweed Identifying Photos

Stems are hollow and segmented with partitions

New shoots emerging in the spring-April/May

Many small whitish flowers along the stems

Flowers attract honeybees and other pollinators

Flowering is arranged in panicles

Seeds, 3-wing calyx, develop in the fall

What to look for during and post construction

Rhizome segments/fragments that have regenerated

Large segment of rhizome regenerating

Accidental spread from rhizome fragments

Construction site with regenerated rhizome segments

Wood chips containing Japanese knotweed

Erosion/scour damage moving rhizomes

Problems resulting from movement of Japanese knotweed propagules in soil material

Roadway sight distance and safety issues

Obstruction of fire hydrant

Structural damage to residential home/basement

Power grid sub-station impacts

River embankment/floodplain/farm field impacts

Dense canopy closure outcompetes native plants

Effects from herbicide and smothering

Herbicide effects on right vs untreated on left

Smothering using 7-mil black plastic and 4” mulch

Herbicide treatment after June cutting (Before)

Success of post flowering herbicide treatment (After)

Mutation resulting from insufficient herbicide

On-going project using herbicide to restore site

Annual Environmental Conference, February 28 – March 9, 2023
Workshop Descriptions and Fundamentals for Conservation Commissioners Units Content

Tuesday, February 28, 2023

Workshop Series A

9:00 – 10:00 AM

A1 Delineating Coastal Beaches, Dunes, Banks and Barrier Beaches in Developed/Altered Areas, and Evaluating Functions under the WPA Regulations

Massachusetts Department of Environmental Protection (MassDEP) and Coastal Zone Management (CZM) representatives will provide up-to-date guidance on the delineation of coastal beaches, coastal dunes, barrier beaches, and coastal banks in developed areas and/or areas with human alteration. In addition, this workshop will clarify how to assess storm damage and flood control functions of these altered resource areas to reduce future flooding and erosion impacts. Case studies will be reviewed to provide conservation commissioners and consultants with keys to understanding how to evaluate the functions of resource areas in developed and altered areas.

Speakers: Rebecca Haney, CFM, Coastal Geologist, MA Office of Coastal Zone Management
Nate Corcoran, Coastal Geologist, MassDEP, Southeast Regional Office

10:30 – 11:30 AM

A2 Climate Change Provisions for Local Wetland Bylaws and Regulations

Funded by the Municipal Vulnerability Preparedness Program (MVP) and in collaboration with the MACC Climate Conversations Committee, the towns of Bolton and Clinton and their consulting team have developed recommended language to update municipal wetland protection bylaws and regulations with climate-smart provisions. This presentation will review the publicly available tools produced by the project, including a climate wetland bylaw provision database and a user-friendly website tool for climate wetland regulations. The MACC Climate Conversations Committee, along with the project team consultants, reviewed climate-smart provisions from municipalities across the state. The MVP project team consultants, including an attorney and a wetland scientist, then integrated, added to, and prioritized into recommended climate-smart bylaw and regulatory provisions, which were then reviewed by the MACC Climate Conversations Committee and by the Bolton and Clinton Conservation Commissions. The tools developed in this project are intended to facilitate integration of climate-smart provisions into local wetland bylaws and regulations.

Speakers: Gillian Davies, PWS, Senior Ecologist, Natural Climate Solutions Specialist, BSC Group, Inc.
Rebecca Bucciaglia, Conservation Agent, Town of Bolton; Conservation Commissioner, Town of Clinton
Nathaniel Stevens, Esq., Partner, McGregor Legere & Stevens PC; Conservation Commissioner, Town of Arlington; MACC Director

1:00 – 2:00 PM

A3 Assessing, Replacing and Permitting Road-Stream Crossings

Conservation commissions have a dual role regarding the replacement of culverts (and bridges) in their communities. They can play an important role in assessing and prioritizing culverts for replacement, and as advocates for better crossing designs that allow fish and wildlife passage. Commissions are also responsible for permitting culvert replacements, including review of crossing designs and construction plans, and interpretation of the regulatory standard to meet the River and Stream Crossing Standards "to the maximum extent practicable." This workshop will cover the assessment and prioritization of culverts for replacement, as well as what to look for when permitting culvert replacements and how commissions can apply the "maximum extent practicable" standard.

Speaker: Scott Jackson, Extension Professor, Department of Environmental Conservation, University of Massachusetts-Amherst; Conservation Commission, Town of Whately

2:30 – 3:30 PM

A4 Vernal Pools: What They are and How to Protect Them in a Changing Climate

Vernal pools are an important component of healthy ecosystems across the state, and they receive a host of legal protections under federal, state, and local wetland regulations. Their ecological values are at the root of why we protect them; their variety, temporary nature, and fluctuations are at the root of why we're often confused about how we protect them. This presentation will explore and explain the function of vernal pools and get deep into the muddy regulatory protection for these important wildlife habitats. This workshop does not specifically focus on vernal pool certification methodology.

Speaker: Matt Burne, Senior Ecologist, BSC Group, Inc.; Conservation Commission, City of Malden; Vice President, Vernal Pool Association; MACC Director

4:00 – 5:00 PM

A5 Encouraging BIPOC Environmental Professionals to Serve on Conservation Commissions

This workshop discusses mentorship opportunities for Black, Indigenous, and People of Color (BIPOC) interested in the environmental field. Learn about opportunities and career tracks from a panel of BIPOC professionals from across the state; about their work and experiences in the field of climate resilience and natural resource (land and water) conservation. Panelists will speak to their organization or practice addressing issues of Diversity, Equity, Inclusion and Justice as well as involving Environmental Justice populations in crafting climate resilience strategies for their neighborhoods. The panel will include members of the Professionals of Color in the Environment (POCIE) network and will discuss how conservation commissions across MA can increase awareness about and encourage the participation of the next generation of BIPOC professionals to serve on these commissions.

Speakers: Pallavi K. Mande, Founding Director, Tamraparni; Conservation Commission, Brookline; MACC DEI Committee Co-Chair

Fundamentals for Conservation Commissioners

6:00 – 8:30 PM

***Unit 101:* Overview of Conservation Commissions: Organizational Structure and Authority**

This Fundamentals unit covers a commission's key responsibilities and discusses the importance of building productive relationships with local boards and state/federal agencies. The sources of a conservation commission's funding and fees are also covered. This is a required class for the MACC Certificate

Program. Take this class and build on your Fundamentals Program credits throughout the conference! Learn tips from experienced professionals.

Instructor: Michele Grzenda, Conservation Director, Lincoln; President, Massachusetts Society of Municipal Conservation Professionals

Wednesday, March 1, 2023

Workshop Series B

9:00 – 10:00 AM

B1 Planning for Open Space Protection and DCS Grant Opportunities

Massachusetts Division of Conservation Services (DCS) offers several grant programs for acquisition and protection of open space. This workshop will provide a brief overview of programs available to municipalities including the Local Acquisition for Natural Diversity Grant (LAND) grant, Conservation Assistance for Small Communities grant, Landscape Partnership grant and the Land & Water Conservation Fund program. Learn how an Open Space and Recreation Plan can help prioritize land conservation opportunities and ensure your municipality's eligibility, as well as highlight examples where non-profit partnerships helped achieve complex, but important transactions.

Speakers: Vanessa Farny, Forest and Land Program Manager, MA Division of Conservation Services
Melissa Cryan, Grant Programs Supervisor, MA Division of Conservation Services

10:30 – 11:30 AM

B2 Respectful Relationships: How Conservation Entities Can Engage with Northeast Indigenous Tribes

This important workshop will outline how conservation groups can include land justice in their work. The presenters will review tools that can be used to engage in this work and describe appropriate ways to engage Indigenous Tribes in the region. Two land trust practitioners, along with a member of the Nipmuc Tribe, will share their experiences of collaborating and working together. Learn the principles of respectful relationships so that environmental scientists, conservation commissions, and other environmental professionals can work with Indigenous persons in a way that respects their culture and acknowledges and appropriately compensates them for their time and expertise. They will discuss the importance of centering relationships and reciprocity in this work. Tools, such as cultural use and respect agreements, cultural inventories, and co-management plans, will be shared. There will also be a discussion of the need and opportunity for land rematriation, and opportunity for a question-and-answer period. Do not miss this worthwhile presentation!

Speakers: Jennifer Albertine, Climate and Land Justice Specialist, Mount Grace Land Conservation Trust; Conservation Commission, Town of Petersham
Sally Loomis, Executive Director of Hilltown Land Trust
Andre Strongbearheart Gaines, Jr., Nipmuc Citizen, Cultural Steward, Creative Director of No Loose Braids

1:00 – 2:00 PM

B3 Identifying Mean Annual High Water using Bankfull Field Indicators under the Rivers Protection Act

The Wetlands Protection Act regulations define Riverfront Area (RFA) as that area between a river's mean annual high water (MAHW) line and a parallel line measured horizontally. In most cases, a riverbank's first observable break in slope is coincident with the MAHW line. However, in some instances, the MAHW line is determined by using bankfull field indicators. This workshop will describe the concept of bankfull discharge

and its regulatory relationship to MAHW. Field indicators of bankfull discharge will be described and discussion will include difficult field situations. Attendees may find it helpful to be familiar with the regulatory language concerning RFA.

Speaker: Heidi Davis, Senior Environmental Analyst, Lead for MassDOT Unit, MassDEP

2:30 – 3:30 PM

B4 Creating Conservation Commission and Land Trust Partnerships to Enhance Land Protection Successes
Land conservation work is becoming increasingly complex and the window of time in many communities to conserve important properties is growing shorter. The presenters will highlight three recent successful land protection projects in Stow that were accomplished in partnership between the town conservation commission and a volunteer land trust. The projects each used creativity and nontraditional partners to advance community housing and planning goals and accomplish more than either partner could have done individually. The focus will be on lessons learned and strategies to maximize success. Come prepared to be inspired to tackle your community's most challenging project!

Speakers: Kathy Sferra, Conservation Director, Town of Stow
Bob Wilber, Director of Conservation Services, Commonwealth of Massachusetts; President Stow Conservation Trust

4:00 – 5:00 PM

B5 Biodiversity and Buffer Zone Restoration at Franklin's DelCarte Conservation Area
The purpose of this restoration project was to increase the biodiversity of the native pollinator-plant and aquatic-terrestrial systems within the Buffer Zone at DelCarte Conservation Area in Franklin via the 1) revegetation of native flowering plants with different bloom times and source types for three native at-risk *Bombus* (bumblebee) species and the 2) installation and demarcation of designated freshwater Turtle Nesting Habitat in a previously disturbed area. The purpose of this work was to maintain the function and diversity of DelCarte's natural ecosystem. In doing so, this project aims to ensure future protection and success of Massachusetts native flora and fauna species and their ecological interactions. This workshop will provide lessons learned from the project so conservation commissioners and other environmental professionals can apply these steps to foster biodiversity during restoration projects in their community.

Speakers: Breeka Li Goodlander, CWS, PWS, CERPIT, Conservation Agent and Natural Resource Protection Manager, Town of Franklin
Patrick Gallagher, Esq., Chair, Conservation Commission, Town of Franklin

Thursday, March 2, 2023

Workshop Series C

9:00 – 10:00 AM

C1 BioMap: Informing the Future of Conservation in Massachusetts
The new BioMap, released in the Fall of 2022, builds on BioMap2 with many new innovations and advances. Statewide habitat data are now complemented by the addition of local biodiversity components. This opens a world of new opportunities for Massachusetts cities and towns to apply this innovative tool to plan, prioritize, and seek funding. BioMap also functions as a climate resilience planning tool, incorporating resilient habitat and ecosystem data. Other enhancements include a habitat restoration and management resource center, the latest rare species habitat data, and regional components for planning at scales larger than Massachusetts. This session will include three phases: 1) An overview of the new BioMap, including local components and other innovations 2) A live tour of BioMap

tools and resources, and a tutorial on the interactive map. 3) Questions and answers, along with input from participants on BioMap resources, web tools, and interactive map. Don't miss this important presentation!

Speakers: Andy Finton, Conservation Ecologist, The Nature Conservancy
Everose Schlüter, Assistant Director, Natural Heritage & Endangered Species Program

10:30 – 11:30 AM

C2 Protecting Wildlife Habitat

Wildlife habitat is one of the eight "interests" protected by the MA Wetlands Protection Act. Applicants are required to submit wildlife habitat evaluations for certain projects and conservation commissions are supposed to ensure that projects affecting resource areas do not reduce the capacity of those areas to serve as wildlife habitat. Conservation commissions have other ways of protecting habitat as well, including land protection, land stewardship, and by seeking opportunities to enhance landscape connectivity. This workshop will cover the basics of protecting wildlife habitat during project review and permitting, and how to work with others in your community to protect habitat more broadly.

Speaker: Scott Jackson, Extension Professor, Department of Environmental Conservation, University of Massachusetts-Amherst; Conservation Commission, Town of Whately

1:00 – 2:00 PM

C3 Utility Project Planning: A Blueprint for a Grey Area

This workshop will present an overview of planning large-scale capital utility infrastructure projects. From data collection, to permitting, to construction, we hope to provide insight into the planning and coordination required to repair and improve electric utilities. This discussion will shine a spotlight on the extensive coordination conducted with regulatory agencies and our efforts towards avoidance, protection, and preservation efforts in stewardship. This presentation will also include a discussion of early successional habitat found on Rights of Way (ROWs) in New England (highly valuable habitat for turtles, osprey, snakes, etc.), Monarch Candidate Conservation Agreement with Assurances (CCCA), drone program, Natural Capital Enhancements program, ROW biodiversity study and Integrated Vegetation Management (IVM) Plans.

Speakers: Corey Schutzman, Lead Environmental Scientist, National Grid
Melaina Polan, Associate Specialist, Graduate Development Program, National Grid
Jason Magoon, Senior Vegetation Operations Supervisor, National Grid

2:30 – 3:30 PM

C4 Stormwater Management Systems: Importance of Groundwater Hydrology

Notices of Intent (NOIs) for larger projects include a stormwater management report containing the stormwater management system design. To meet the recharge goal of the Massachusetts Stormwater Handbook, the design will include surface and subsurface detention Best Management Practices (BMPs) used to infiltrate runoff into the subsurface. Consultants use HydroCad to design these systems in accordance with the Handbook, Volume 3, Standards 2 and 3. However, the Standards and HydroCad either neglect or oversimplify groundwater hydrology. Furthermore, the investigation requirements described in Volume 2, Chapter 2 of the handbook are often not met, which can lead to inadequately designed systems. This workshop will provide a layman's primer on groundwater hydrology; a description of the Volume 2 requirements; an investigation requirement checklist that commissions or peer reviewers can use; some suggested language for Orders of Conditions; and one or two case studies. Bring your questions to this important workshop!!

Speaker: Andrew Koenigsberg, Hydrogeologist, Member of Westborough Conservation Commission

4:00 – 5:00 PM

C5 Reforming Mosquito Control in Massachusetts

The existing mosquito control program in Massachusetts is antiquated and needs a major overhaul, as documented by the Mosquito Control for the 21st Century Task Force. The mosquito control program relies far too much on routine spraying of chemicals that are highly toxic to fish, pollinators, and many other beneficial species and not enough on ecologically-based solutions like good housekeeping, improved stormwater management, and restoration of streams and wetlands. The Massquito Coalition, of which MACC is a member, is supporting legislation that would overhaul this outdated system, benefiting both human and environmental health. Bring your questions about mosquito management, proposed legislation, and related issues, to this presentation!

Speakers: Heidi Ricci, Director of Policy & Advocacy, Mass Audubon; MACC Officer (and former member of the Mosquito Control for the 21st Century Task Force)
Kyla Bennett, PhD, JD, Science Director at Public Employees for Environmental Responsibility, and member of the Massquito Coalition.

6:00 – 7:30 PM

Special Session 1 Guest Speaker and Environmental Service Awards Celebration

All conference attendees, speakers, volunteers, sponsors, and supporters are invited to this FREE virtual celebration to honor environmental service award recipients and listen to our Guest Speaker. MACC is finalizing this part of the schedule and will update our members as we get closer to the conference. Our celebration will start at 6:00 PM with our speaker, and then we will move into the awards celebration. This virtual celebration is not to be missed!

Saturday, March 4, 2023

9:00 – 10:00 AM

Special Session 2 Annual Business Meeting and Guest Speaker

MACC will hold the 2023 Board of Directors' Election and Annual Business meeting on March 4, 2023, starting promptly at 9:00 AM. Following the completion of the Annual Business Meeting, at approximately 9:30 AM, we will have a Guest Speaker (MACC is finalizing this part of the schedule and will update our members as we get closer to the conference). All conference attendees, speakers, volunteers, sponsors, and supporters are invited to this FREE virtual celebration.

Fundamentals for Conservation Commissioners

10:00 AM – 12:30 PM

Unit 203 **Open Space Planning and Protection Techniques**

This is an elective class for the MACC Certificate Program. Participants will learn about establishing conservation goals and objectives, taking inventories of local natural resources, selecting parcels, and working with landowners. Participants will also learn about conservation restrictions, grants, and funding sources for acquiring land. This is a useful class for commission members, staff, and new members of land trusts alike.

Instructor: Robert Wilber, Director of Conservation Services, Commonwealth of Massachusetts

Workshop Series D

11:00 AM – 12:00 PM

D1 Potpourri Q & A: All Your Burning Legal and Practical Commission Questions

Conservation agents and commission members have so many questions on so many subjects and so few sources of straight answers and useful tips. This workshop is a space for you to throw out what's on your mind. It will be fast paced, focused on nuts and bolts, and painfully practical. Expect responses to be brief and to the point. Bring your burning questions relating to wetlands, laws, procedures, meetings, powers, enforcement, financial or personnel issues, politics, practices, needs, and problems that plague conservation commissions. We will give you off-the-record legal information and reliable practical direction of the sort you get on the MACC Help Line without having to write it down or wait for a reply! This workshop is perfect for beginner as well as advanced participants.

Speakers: Gregor I. McGregor, Esq., Principal, McGregor Legere & Stevens, PC; MACC Director
Michele Grzenda, Conservation Director, Lincoln; President, Massachusetts Society of Municipal Conservation Professionals

1:00 – 2:00 PM

D2 Understanding the Wetlands Protection Act's Agricultural and Forestry Exemptions

In a general sense, both agriculture and timber harvesting are exempt activities under the Wetlands Protection Act. However, there are some important terms and considerations that define and qualify the agricultural exemption, such as: distinguishing agriculture from backyard gardens or the keeping of recreational animals (e.g., horses); production versus processing (sugar houses) or sale (e.g. farm stands) of an agricultural commodity; and what types of farming activities are and are not covered under the exemption. For timber harvesting, the exemption applies differently for commercial harvests versus when landowners cut timber for their own use. This workshop will cover the details of the agricultural/forestry exemptions and limited project provisions for some agricultural activities.

Speaker: Scott Jackson, Extension Professor, Department of Environmental Conservation, UMass Amherst; Conservation Commissioner, Town of Whately

2:30 – 3:30 PM

D3 Industrial Ground-Mounted Solar: Challenges Municipalities Face while Protecting Wetlands, Rivers, Forests, and Farmland

About 5,000 acres of open space have already been converted to industrial scale solar since approximately 2010, with 150,000 more acres potentially targeted under the state's climate plan. It's up to local governments to ensure that the siting, operation and decommissioning of these multimillion-dollar projects is consistent with goals for climate resiliency, biodiversity, water quality, water quantity and river and wetland health. Land use in Massachusetts is a matter of local home rule and zoning powers leaving local governments to play a key role in balancing these considerations. Hear about case studies and trends that impact conservation commissions and municipal bodies grappling with solar siting.

Speakers: Margaret Sheehan, Esq., Organizer, Save the Pine Barrens
Fred Beddall, Farmer and Owner, Pie in the Sky Berry Farm

Saturday, March 4, 2023

Workshop Series E

11:00 AM – 12:00 PM

E1 Dam Removal, Culvert Upgrades, and Wetland Restoration: Best Practices for Conservation Commissions

Interest in river and wetland restoration continues to grow across the state as communities and landowners deal with aging infrastructure and seek to build resilience to climate change. Common project types include culvert upgrades, dam removals, and coastal wetland restoration. Conservation commissions play many roles in relation to these projects. Some commissions are project proponents. Others are partners or supporters. All have a critical role in project review under the Wetlands Protection Act. This workshop provides an update on restoration in Massachusetts followed by a panel discussion of the best practices for commissions involved in these projects.

Speaker: Beth Lambert, Director, Division of Ecological Restoration, MA Department of Fish and Game

1:00 – 2:00 PM

E2 Protecting Habitat and Wetlands while Permitting Utility Maintenance Projects

As the demand for energy continues to rise, maintaining a safe and reliable electric and gas transmission system has never been more critical. To ensure reliability and support the Commonwealth's clean energy goals, utility companies must maintain existing infrastructure to prepare for increased electrical loading, support proliferation of renewable generation, and improve resiliency in the face of more frequent and intense storm events.

Presenters will discuss the steps necessary to plan, permit, and maintain electric and gas transmission systems while keeping wetland and wildlife protection a priority. An overview of compliance with Wetlands Protection Act Regulations will be provided. Project examples will be discussed to demonstrate how utility maintenance projects can be successfully completed while protecting or improving the functions and values of wetland resource areas.

Speakers: Matthew Waldrip, CESSWI, PWS, Licensing & Permitting Supervisor, Eversource
Rebecca Weissman, PWS, CWS, Energy Director – Northeast, SWCA Environmental

2:30 – 3:30 PM

E3 Developing and Implementing a Municipal Sustainability and Climate Action Plan

This workshop will cover practical actions towns can take to develop and integrate ENERGY (e.g., renewable power), CLIMATE (e.g., stormwater management) and ENVIRONMENT (e.g., open space and land use strategies) into a more holistic and systematic sustainability / climate action plan. We will cover examples of what other cities and towns are doing both on their own and within their given planning regions. We will also cover funding opportunities, key action items, and how to leverage existing initiatives already being undertaken, including master planning and public engagement efforts. This more holistic, systematic approach is important because climate change is caused by carbon-based energy consumption, which is driving more severe droughts and flooding events, which requires better freshwater and stormwater management as well as land use practices. In addition, sustainability-related initiatives often go through similar funding and oversight processes, while impacting similar community stakeholders, and it is becoming increasingly difficult for municipalities to manage all this work without improved coordination and additional resources.

Speaker: Thomas Birmingham, Member, Canton Conservation Commission

Saturday, March 4, 2023

Workshop Series F

11:00 AM – 12:00 PM

F1 Creating Opportunities for Environmental Education in Your Community

Climate change as a concept can be overwhelming for many people. Through Environmental Education and Outreach we can inform and educate individuals on ways to make small changes to their lifestyles that can have big impacts locally and globally. Many communities have a limited staff and budget for their Natural Resources Commission or their Conservation Commission and often do not have experienced science educators on staff. This workshop will empower non-traditional educators to develop programs and program materials for education and outreach to reach their target demographic. Participants will learn how to get started, how to develop meaningful collaborations, and will hear about several examples of simple start-up opportunities for providing Environmental Education to different members of the community.

Speaker: Lisa Moore, Environmental Education, Outreach and Compliance Coordinator, Natural Resources Commission, Town of Wellesley

1:00 – 2:00 PM

F2 Desktop Wetlands Delineation Review

This important workshop will provide practical tips and strategies for reviewing the locations of jurisdictional resource areas on plans prior to a site visit or to aid in the decision to ask for a third-party review. Topics covered will include how to review Delineation Data Sheets; Abbreviated Notice of Resource Area Delineation (ANRAD) reviews; how to determine Federal Emergency Management Agency (FEMA) floodplain elevations; calculation reviews for Isolated Land Subject to Flooding (ILSF); interpreting aerial photos and topographic maps; using the desktop review to conduct an effective site visit; and online resources (MassMapper, Natural Resource Conservation Service (NRCS) Soil Survey, etc.). The material presented will be appropriate for both new and experienced conservation commissioners/agents.

Speakers: Judith Schmitz, Section Chief, MassDEP Wetlands Program Central Region
Mia McDonald, Circuit Rider, MassDEP Wetlands Program Central Region

2:30 – 3:30 PM

F3 Effective Project Review: Best Practices for Conservation Commissions

This workshop will provide conservation commissioners and agents with best practices to apply throughout a proposed project's life cycle. We will discuss practices and strategies to implement at each stage of a project, including reviewing an application, taking public comment, how to conduct site visits, closing a public hearing, drafting strong decisions, and enforcing those decisions later. We'll illustrate these points with case studies and real-life examples. Conservation commissioners with two or more years or more experience will find this workshop very beneficial.

Speakers: Olympia Bowker, Esq., Senior Associate, Anderson & Kreiger LLP
Jessica Wall, Esq., Partner, Anderson & Kreiger LLP

Tuesday, March 7, 2023

Workshop Series G

9:00 – 10:00 AM

G1A **Soils of Massachusetts and Wetlands: Part A (double session)**
How did the soils of Massachusetts get to be the way they are, and how does that affect where and how wetlands form? The speaker will provide an overview of soil formation in the glaciated northeast and the resultant general characteristics and variabilities with emphasis on soil parent material; the stuff from which the soils developed. The objective is to provide a context for wetland formation under different soil-landscape scenarios and background information for "Soils of Massachusetts and Wetlands, Part B". This workshop will be useful to all commissioners and consultants alike.

Speaker: Al Averill, Certified Professional Soil Scientist

10:30 – 11:30 AM

G1B **Soils of Massachusetts and Wetlands: Part B (double session)**
How does soil morphology serve to identify wetlands? The speaker will offer a discussion of soil-hydrological relationships and influence on soil profile formation and morphology with emphasis on the effect of wet conditions. The objective is for folks to have an increased understanding of the morphological variabilities under different wetness and soils conditions. Standards applied to field documentation and sources of information will be covered. **Prerequisite: "Soils of Massachusetts and Wetlands, Part A**".

Speaker: Al Averill, Certified Professional Soil Scientist

1:00 – 2:00 PM

G2 **Restoring Old-Growth Characteristics to the Forests of Massachusetts**
Old forests, with their abundant downed deadwood, multiple canopy layers, and variation in tree densities and sizes, are different from our second growth forests. These differences have important implications for forest benefits such as wildlife habitat and climate change mitigation, but old forests are rare in our landscape. A combination of passive and active approaches can restore these missing characteristics. This webinar is designed for professional foresters, ecologists, forest landowners, and local conservation leaders.

Speaker: Paul Catanzaro, Professor, State Extension Forester, and Co-Director of the Family Forest Research Center, University of Massachusetts – Amherst

2:30 – 3:30 PM

G3 **Massachusetts Forest Health Updates**
The presentation will cover the Department of Conservation & Recreation (DCR) Forest Health Program's annual aerial survey results, as well as insect and disease updates for our most damaging pests. Topics will include Asian Long-horned Beetle, Beech Leaf Disease, Spongy Moth, Spotted Lanternfly, and more.

Speakers: Felicia Hubacz, Forest Health Specialist, MA Department of Conservation and Recreation Forest Health Program
Elizabeth Barnes, Forest Pest Outreach Coordinator, MA Department of Agricultural Resources

4:00 – 5:00 PM

G4 Trail Tales: Engaging the Public in Trail Use Discussions and Developing an Implementation

Conservation land and trails are often utilized for recreation, quiet contemplation, and to feel a connection to nature. Trail use and visitation has been steadily rising for many years. While our appreciation for local open spaces jumped to a whole new level during COVID-19, increased visitation resulted in greater conflict in user groups, overuse of parking lots, erosion along trails and trailheads, and creation of illegal trails. As a result of this, there is no better time for a town to look at their land use vision and philosophy. Michele Grzenda will do a deep dive into several trail use activities, why some of these activities cause conflict, and how to engage the public in a conversation about changes in allowed trail uses. We will also discuss ways to improve the visitor experience with signage, education, and outreach ideas.

Speaker: Michele Grzenda, Conservation Director, Town of Lincoln; President, Massachusetts Society of Municipal Conservation Professionals

Fundamentals for Conservation Commissioners

6:00 – 8:30 PM

Unit 102 **The Wetlands Protection Act: Fundamentals, Process and Procedures**

This required Fundamentals Unit will provide participants with an understanding of the Interests of the Act and a Commission's jurisdiction, permit submittal requirements and forms, an overview of identifying resource areas, and a discussion of "Limited Projects". Learn tips from experienced professionals!

Instructors: Jennifer Hughes, Environmental Analyst, Massachusetts Environmental Policy Act Office; Conservation Commission, Town of Ipswich; MACC Director
Claire Rundelli, ENV SP, Planner Conservation Agent, Town of Natick; MACC Education Committee Member

Wednesday, March 8, 2023

9:00 – 10:00 AM

H1-A Winter Woody Wetland Plants: Part A (double session)

In the virtual realm, hands-on workshops are challenging. But as commissioners, we still need to know some basic wetland plants – especially in the off-season – as part of field recognition of vegetated wetlands. Rather than limiting the number of participants by the number of twig samples we are able to collect and then mail to participants, we will more broadly present photographs and images of common wetland plants in Massachusetts, and then focus on the most prominent characteristics that make identification easier – particularly in the off-season.

The first part of the workshop will be dedicated to a review of some basic botanical terminology and then in the second part we will explore some of the more common woody wetland plants found in forested swamps and shrub swamps in Massachusetts. This workshop is intended for beginners and/or a refresher on basic wetland plant identification.

Speakers: Amy Ball, PWS, CWS, Senior Project Manager – Ecology, Horsley Witten Group; MACC President Karro Frost, Conservation Planning Botanist, Natural Heritage and Endangered Species Program, Massachusetts Division of Fisheries and Wildlife

10:30 – 11:30 AM

H1-B Winter Woody Wetland Plants: Part B (double session)

In the virtual realm, hands-on workshops are challenging. But as commissioners, we still need to know some basic wetland plants – especially in the off-season – as part of field recognition of vegetated wetlands. Rather than limiting the number of participants by the number of twig samples we are able to collect and then mail to participants, we will more broadly present photographs and images of common wetland plants in Massachusetts, and then focus on the most prominent characteristics that make identification easier – particularly in the off-season.

The first part of the workshop will be dedicated to a review of some basic botanical terminology **and then in the second part we will explore some of the more common woody wetland plants found in forested swamps and shrub swamps in Massachusetts.** This workshop is intended for beginners and/or a refresher on basic wetland plant identification.

Speakers: Amy Ball, PWS, CWS, Senior Project Manager – Ecology, Horsley Witten Group; MACC Director
Karro Frost, Conservation Planning Botanist, Natural Heritage and Endangered Species Program, Massachusetts Division of Fisheries and Wildlife

1:00 – 2:00 PM

H2 Cutting the Green Tape: Streamlining Wetlands Restoration

Massachusetts is a leader in wetlands protection and restoration, and climate change makes this work even more urgent. From upgrading culverts and removing dams to restoring salt marshes, rivers, and cranberry bogs and removing invasive plants, there are thousands of opportunities to reverse the damage caused by centuries of development. With hundreds of millions of dollars in federal and state funding now becoming available, we have a once in a lifetime opportunity to accelerate restoration. Learn about efforts to reduce the cost and paperwork required to advance this work, and examples of success from other states. Bring your burning questions and suggestions for streamlining wetlands restoration.

Speakers: Heidi Ricci, Director of Policy & Advocacy, Mass Audubon; MACC Officer
Beth Lambert, Director, Division of Ecological Restoration, MA Department of Fish and Game

2:30 – 3:30 PM

H3 Japanese Knotweed Three Ways: Teaching Tool, Management Muddles, and Troubles with Contaminated Fill

Japanese knotweed is one of the most difficult invasive plants to manage. Three invasive plant management and restoration practitioners will relay their experience battling this pernicious plant-focusing on both the challenges, and opportunities that knotweed management in a municipal setting presents. The workshop will be divided into three sections- (1) An overview of Japanese Knotweed biology and current strategies for management; (2) A look at the Town of Weston's approach to using volunteers to map knotweed populations and establish management test plots on municipal conservation land; and (3) A look into a recent court case initiated by a landowner against a contractor for introducing knotweed to a site through contaminated fill.

Speakers: Joan Deely, Senior Project Manager and Permitting Specialist, Land Stewardship, Inc.; Conservation Commission, Town of Leverett; MACC Director
Chris Polatin, MS, CERP, President, Land Stewardship, Inc.; Conservation Commission, Town of Gill
Jordan McCarron, Conservation Administrator, Town of Weston

4:00 – 5:00 PM

H4 **Helping People Out of Harm's Way - Home Buyouts and "Un-developing" Floodplains**
Does your community have homes and other structures built in the floodplain? Have you thought about whether and how to help those households relocate to higher ground and restore the land to floodable terrain? Many municipalities across the country, as well as state and federal agencies, use home buyouts as a tool to reduce risk to the residents and reclaim land that should be serving as a buffer between the water and development. Carri Hulet is a collaboration expert who has been working with buyout program managers and buyout recipients in various contexts for over seven years. She will share best practices and common challenges when doing buyouts, and facilitate a workshop-style conversation about how and where to start or expand an existing program. Carri will be joined by Ben Wicker, a state government buyout manager from Louisiana who is now working as a private contractor with SHK Consulting, LLC. Ben helped build one of the largest buyout programs in the country, including customizing the program for local needs across a diverse range of communities.

Speaker: Carri Hulet, Principal, CH Consulting (collaboration expert, facilitator, and mediator focused on climate resilience
Ben Wicker, Associate Partner, SHK Consulting, LLC

Thursday, March 9, 2023

Workshop Series J

9:00 – 10:00 AM

J1 **MassDEP Update on Proposed Wetlands Climate Resiliency Regulations**
MassDEP's Wetlands program is embarking on several initiatives to support climate resiliency. Learn about the latest in the regulatory and other fronts that the program is implementing to support climate resiliency.

Speaker: Lisa Rhodes, Wetlands Program Chief, MassDEP

10:30 – 11:30 AM

J2 **Survey of Seminal Land Use and Environmental Cases in 2021-2022**
MACC members, who range from conservation commissioners and staff to professional consultants and scientists, to planners and engineers, to educators and advocates, to landowners and land trusts, to applicants and their legal counsel, need to understand and appreciate the body of land use law coming constantly from the US Supreme Court, MA Supreme Judicial Court, and our Appeals Court. The reason is that these precedent-setting court decisions legally govern and guide administration and enforcement of our wetlands, water, wildlife, zoning, health, safety, climate, coastal, energy, and other laws. This growing jurisprudence provides the legal foundation (and ceiling) for governmental powers and procedures. The audience will receive a collection of 12 short articles on these seminal federal and Massachusetts cases decided during the years 2021-2022.

Speaker: Gregor I. McGregor, Esq., McGregor Legere & Stevens PC; MACC Director

1:00 – 2:00 PM

J3A Restoration of Retired Cranberry Bogs: Part A - Presentation (double session)

This workshop will provide an overview of the restoration opportunities for cranberry farm owners looking to retire their bogs. We will provide a background on the history of cranberry farming and the cranberry plant, an outline of the typical process for retiring bogs and restoring them to wetlands, an overview of funding opportunities, and an introduction to possible restoration methods. We will discuss some of the design and construction challenges. This presentation **will be followed in Part B by a virtual field trip** to the Tidmarsh Farms Wildlife Sanctuary (Mass Audubon) and the Foothills Preserve (Town of Falmouth) where we will observe the restoration practices implemented from 2017 to 2020 to see different stages of recovery.

Speaker: Nick Nelson, Fluvial Geomorphologist, Inter-fluve, Inc.

2:30 – 3:30 PM

J3B Restoration of Retired Cranberry Bogs: Part B – Virtual Field Trip (double session)

This 2nd part of the workshop will be a virtual field trip to the Tidmarsh Farms Wildlife Sanctuary (Mass Audubon) and the Foothills Preserve (Town of Falmouth) where we will observe the restoration practices implemented from 2017 to 2020 to see different stages of recovery.

See J3A for the description of the first half of this double-session workshop.

Speaker: Nick Nelson, Fluvial Geomorphologist, Inter-fluve, Inc.

4:00 – 5:00 pm

J4 Overview of the *Massachusetts Handbook for Delineation of BVWs* and *Massachusetts Inland Wetland Replacement Guidelines*

In the spring of 2023, MassDEP and UMass-Amherst will release revised versions of both the *Massachusetts Handbook for Delineation of [Bordering Vegetated Wetlands] BVWs* and *Massachusetts Inland Wetland Replacement Guidelines.* This presentation provides an overview of the new document highlights. A tentative schedule of upcoming field training classes will be provided for more in-depth, future outreach events for the late spring and early summer 2023. Learn about important changes and enhancements of these newly revised guidance documents from experts at MassDEP and UMass Amherst.

Speakers: David Hilgeman, Supervisor of the Major Projects and Policy Unit, MassDEP Wetlands Program
Scott Jackson, Extension Professor, Department of Environmental Conservation, UMass Amherst; Conservation Commissioner, Town of Whately

Fundamentals for Conservation Commissioners

6:00 – 8:30 PM

***Unit 103* Plan Review and Site Visit Procedures**

This required Fundamentals Unit will provide participants with an understanding of how to read maps and engineering plans typically submitted to conservation commissions. The class also provides an understanding and overview of site visits, including how to prepare for and conduct site visits as a commission. This is a great class for new commissioners as well as consultants.

Instructor: Karro Frost, Conservation Planning Botanist, Natural Heritage and Endangered Species Program, Massachusetts Division of Fisheries and Wildlife


175 Littleton County Road

DRAFT

HARVARD CONSERVATION COMMISSION
MINUTES OF MEETING
OCTOBER 20, 2022

Chair Don Ritchie called the meeting to order at 7:01pm**,** virtually, pursuant to Chapter 107 of the Acts of 2022, An Act Relative to Extending Certain COVID-19 Measures Adopted during the State of Emergency, and signed into law on July 16, 2022, under MGL Chapter 131 §40 Wetland Protection Act and Code of the Town of Harvard Chapter 119 Wetland Protection Bylaw

Members Present: Don Ritchie, Eve Wittenberg, Paul Willard, Jaye Waldron, Joanne Ward, Jim Burns and John Iacomini (Associate Member)

Others Present: Liz Allard (Land Use Boards Administrator/Conservation Agent), Ben Urquhart (Deer Management Subcommittee), Dan Tracey, Mannie Lando, Bob Douglas (Deer Management Subcommittee), Jamie Geothlich, Dan Wolfe (Ross Associates) and Dan Van Schalkwyk (Ayer Department of Public Works Director)

Deer Management Subcommittee Presentation of the Massachusetts Camera Study
Jamie Geothlich, a graduate student from Wisconsin, stated he is part of a study on Managing Suburban Wildlife, in New York and Massachusetts. This interdisciplinary team is working together on the dynamics of wildlife. Within Massachusetts suburban, as well as less suburban, areas are being studied. The focus areas of the study include deer populations, vegetation communities and town prospective. This three-year project started in 2021 and runs through 2024. For the town prospective the study is looking at understanding different concerns of deer in a community. The areas being study are very diverse and create a sampling design. Motion activated cameras, along with vegetation surveys at each camera assists with assessing impacts on vegetation. Access to private lands is harder to obtain than that of public lands. The output from this research would provide the Town with data from the findings, which would assist with decision making. Mr. Geothlich stated he would only be able to provide the data; he is unable to provide goals or predict what could happen if deer management is not taken into consideration.

Don Ritchie asked how many cameras are needed. Mr. Geothlich stated he has a few available cameras; although he is unable to assist with the on-the-ground items, he could assist in assessing locations and setting up a study area. Eve Wittenberg asked what is the output of the research study. Mr. Geothlich stated the results may assist in estimating deer density; recommended if there is a specific issue Harvard wants to address then that would be the focus of the study as opposed the determining the density of deer. Ms. Wittenberg suggested the output would be the damage to the understory in Harvard forests.

Bob Douglas, chair of the Deer Management Subcommittee (DMS), stated the DMS was looking at the number of deer in the forest. The ability to survey private land, along with public lands, would provide good estimates of the entire Town. Mr. Douglas stated he likes this study and has looked into the ability to place camera on private lands. Dan Tracey asked how you know you are not seeing the same deer. Mr. Geothlich stated there are a few different methods; the Jacobson method identifies bucks by their antlers, which are unique to each buck; others methods use math to determine population counts.

The Commission determined additional information would be necessary in order to make a determination as whether or not this study is right for Harvard. A proposal of costs, outreach of private properties owners and location of the cameras was requested from the DMS.

Request for Determination of Applicability Hearing - Paul Cavicchio, 39 Turner Lane, Harvard#1022-01. Opened at 7:34pm

Discuss the Care & Maintenance of the Shaker Herb House, Shaker Road with Historical Commission
Mannie Lando stated the Harvard Historical Commission (HHC) had tried several times to raise funds to preserve the Shaker Herb House on Shaker Road. With continued failures to do so the HHC thought it was time to turn the matter over to Select Board and allow them to determine what could be done with the building. The Town Administrator has stated that it is Conservation Commission who has the authority over this building. Liz Allard corrected Mr. Lando, stating in an October 6th email from the Town Administrator, Tim Bragan, he states "the land is Conservation's, but further states the Historic Commission has always been the one to care for and champion the historic relics such as the Herb House, the Shaker Cemetery, and the Powder House". Mr. Bragan further stated "The main purpose for your Commission is to protect the character of the Historic Districts and you are responsible for community-wide historic preservation planning". Mr. Lando stated HHC is waiting for a response to their original letter to the Select Board on this matter. Jim Burns asked what the desire of those in Shaker Village. Mr. Lando thinks he some would like to see it go away. Mr. Burns asked if the building has it been a source of trouble over the years or has it just been sitting there? Mr. Lando stated there have been no issues.

Request for Determination of Applicability Hearing - Town of Harvard, West Main Street, Harvard, between the Ayer and Shirley town lines, Harvard#1022-02. Opened at 7:49pm

Approve Minutes
This item was passed over this evening

Approve Invoices
There no invoices for approval this evening

Proposal for 400 Beaver Brook, Boxborough (former Cisco property)
Joanne provided an overview of some bylaw amendments being proposed for the Town of Boxborough. Ms. Ward suggested if members of the Commission know anyone in Boxborough they should encourage them to vote for the proposed bylaws.

Continuation of a Notice of Intent Hearing – John Iacomini, 310 Ayer Road, Harvard#0922-05. Opened at 8:00pm

Ayer Road Meadow Access Improvements
There was no update on this item this evening.

Pine Hill Village Update
Liz Allard noted there has been a lack of including the invasive work in the weekly report from the developer; she has reached out to him to remind him that all work on the site should be included within the weekly report.

Adjournment
Paul Willard made a motion to adjourn the meeting at 8:45pm. Jim Burns seconded the motion. The vote was unanimously in favor of the motion by a roll call, Jim Burns, aye; Jaye Waldron, aye; Joanne Ward, aye; Paul Willard, aye; Eve Wittenberg, aye; and Don Ritchie, aye.

Respectfully submitted,

Liz Allard,
Land Use Administrator/
Conservation Agent

DRAFT

EXHIBITS & OTHER DOCUMENTS

- Conservation Commission Agenda, dated October 20, 2022
- Sewage Disposal System Holding Tank Paul Cavicchio 39 Turner Lane Harvard, MA, Job No.: 34066, Plan No.:L-14582, prepared David E. Ross Associates, Inc., 10/3/2022
- Site Plan John Iacomini #310 Ayer Road Harvard, MA, Job No.: 32614, Plan No.: L-14610, prepared David E. Ross Associates, Inc., September 2022

DRAFT

Harvard Conservation Commission
Request for Determination of Applicability Hearing
Paul Cavicchio, 39 Turner Lane, Harvard#1022-01
October 6, 2022

The public hearing was opened at 7:34pm by Chair Don Ritchie under MGL Chapter 131 §40 Wetland Protection Act and the Code of the Town of Harvard Chapter 119 Wetland Protection Bylaw virtually, pursuant to Chapter 107 of the Acts of 2022, An Act Relative to Extending Certain COVID-19 Measures Adopted during the State of Emergency, and signed into law on July 16, 2022.

Members Present: Don Ritchie, Eve Wittenberg, Paul Willard, Jaye Waldron, Joanne Ward, Jim Burns and John Iacomini (Associate Member)

Others Present: Liz Allard (Land Use Administrator/Conservation Agent) and Dan Wolfe (Ross Associates, Inc.)

This hearing is for a Request for Determination of Applicability filed on behalf of Paul Cavicchio for the installation of a sewage disposal system holding tank within the 200' of Bare Hill Pond at 37 Turner Lane, Harvard.

Dan Wolfe, of Ross Associates, stated the application before the Commission is for the replacement of an old system that may be a cess pool. The proposed holding tank will be as far as possible from Bare Hill Pond, while maintaining other regulatory offsets. A well is proposed on the parcel across the roadway. All work will be outside of the 75' wetland buffer zone. An erosion control barrier has been proposed around the existing house to encompass the area of work.

Jim Burns made a motion to close the hearing and issue a Negative #3 Determination of Applicability with the condition that the erosion control barrier is to be inspected by the Conservation Agent or a member of the Commission prior to activity commencing. Jaye Waldron seconded the motion. The vote was unanimously in favor of the motion by a roll call, Jim Burns, aye; Jaye Waldron, aye; Joanne Ward, aye; Paul Willard, aye; Eve Wittenberg, aye; and Don Ritchie, aye.

Respectfully submitted,

Liz Allard,
Land Use Administrator/
Conservation Agent

DRAFT

Harvard Conservation Commission
Request for Determination of Applicability Hearing
Town of Harvard, West Main Street, Harvard, between the Ayer and Shirley town lines
Harvard#1022-02
October 17, 2022

The public hearing was opened at 7:49pm by Chair Don Ritchie under MGL Chapter 131 §40 Wetland Protection Act and the Code of the Town of Harvard Chapter 119 Wetland Protection Bylaw virtually, pursuant to Chapter 107 of the Acts of 2022, An Act Relative to Extending Certain COVID-19 Measures Adopted during the State of Emergency, and signed into law on July 16, 2022.

Members Present: Don Ritchie, Eve Wittenberg, Paul Willard, Jaye Waldron, Joanne Ward, Jim Burns and John Iacomini (Associate Member)

Others Present: Liz Allard (Land Use Administrator/Conservation Agent) and Dan Van Schalkwyk (Ayer Department of Public Works Director)

This hearing is for a Request for Determination of Applicability filed on behalf of the Town of Harvard for the replacement of an existing sidewalk within the 100' wetland buffer zone on West Main Street, between the Ayer and Shirley town lines, Harvard.

Dan Van Schalkwyk, Ayer Department of Public Works Director, stated the proposed work will take place along West Main Street in Ayer, with a small section (the bridge over the Nashua River) being within the Town of Harvard. The Town of Ayer is managing this project as part of improvements along West Main Street. The existing sidewalk, that is in need of repair, will be replaced with a Shared Use Path that will connect with the Shared Use Path in Shirley. All work is being paid for by MassDevelopment. Straw waddles on the slope to the Nashua River, along with silt sacks in the existing catch basins, will be utilized to control erosion.

Jim Burns made a motion to close the hearing and issue a Negative #3 Determination of Applicability with the condition that the erosion control barrier is to be inspected by the Conservation Agent or a member of the Commission prior to activity commencing. Eve Wittenberg seconded the motion. The vote was unanimously in favor of the motion by a roll call, Jim Burns, aye; Jaye Waldron, aye; Joanne Ward, aye; Paul Willard, aye; Eve Wittenberg, aye; and Don Ritchie, aye.

Respectfully submitted,

Liz Allard,
Land Use Administrator/
Conservation Agent

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Harvard Conservation Commission
Continuation of a Notice of Intent Hearing
John Iacomini, 310 Ayer Road, Harvard#0922-05
October 20, 2022

The public hearing was opened at 8:00pm Chair Don Ritchie under MGL Chapter 131 §40 Wetland Protection Act and the Code of the Town of Harvard Chapter 119 Wetland Protection Bylaw virtually, pursuant to Chapter 107 of the Acts of 2022, An Act Relative to Extending Certain COVID-19 Measures Adopted during the State of Emergency, and signed into law on July 16, 2022.

Members Present: Don Ritchie, Eve Wittenberg, Paul Willard, Jaye Waldron, Joanne Ward and Jim Burns

Others Present: Liz Allard (Land Use Administrator/Conservation Agent), Dan Wolfe (Ross Associates) and John Iacomini

This hearing was continued from October 6, 2022 for a Notice of Intent filed on behalf of John Iacomini for the construction of an in-ground swimming pool and patio area, surrounded by a security fence within the 100' wetland buffer zone to a wetland resource area 310 Ayer Road, Harvard

Dan Wolfe, of Ross Associates, stated an issue at last meeting of a number of the members that had not seen the site, so an additional site walk was conducted. Mr. Wolfe sated the proposed pool is within an area that was previously disturbed. Mr. Wolfe reviewed the other suggested areas for locating the pool and why they are not optimal. Jaye Waldron stated her comments from the previous meeting remain the same; suggesting the 50' buffer zone be allowed to return to its natural state by eliminating mowing in that zone. Ms. Waldron is concerned as coming across as arbitrary in allowing structures within the 75'. Eve Wittenberg understands there are limitations on the property, but there needs to be a compelling reason for issuing a waiver to a regulation. Ms. Wittenberg stated the Commission just had an application before them with some similar aspects in which the Commission did not desire to issue a waiver. Ms. Wittenberg does not see a compelling reason to issuing waiver. Paul Willard stated his comments would be the same for any waiver and with alternatives on the site he would not be in favor of a waiver.

Mr. Wolfe reviewed the language with §147-2B of the Wetland Protection Bylaw Regulations; he does not see a pool and patio impacts as enumerated under this section. Mr. Wolfe feels this affords his client a waiver to §147-12 Setbacks, as requested. John Iacomini stated the encroachment within the setback area is in an area of fill that was recently approved, some of it, by this Commission to be re-graded. Don Ritchie felt a pool area is a much different impact then a lawn area. Ms. Waldron noted she abstained from voting on the previous application. Mr. Ritchie asked if the impacts to the 50' wetland buffer zone could be removed. Mr. Iacomini stated the patio area could be shifted outside the 50' wetland buffer zone. Mr. Iacomini asked what impacts would there be to the wetlands? Paul Willard objected to it being suggested that harm will or will not result from this. For Mr. Willard it is just a question of the rules. Mr. Iacomini wondered why the Commission would accept an application and the associated fees if it has hard and fast rules. Mr. Willard reiterated its about the ability to look at the alternative locations for the pool. Jim Burns and Joanne Ward agreed with Mr. Willard pertaining to exploring the alternative locations.

After briefly discussing not wanting to cause undue cost to an applicant, the ability to continue the hearing and perhaps moving the pool closer to the house, Eve Wittenberg made a motion to deny the requested waiver to allow for the pool within 75' of a wetland resource area. Joanne Ward seconded the motion. The vote was unanimously in favor of the motion by roll call vote, Jim Burns, aye; Jaye Waldron, abstained; Joanne Ward, aye; Paul Willard, aye; Eve Wittenberg, aye; and Don Ritchie; abstained.

With the suggestion of exploring alternative locations for the pool, a Department of Environmental Protection File Number not yet received and permission of the applicant, Joanne Ward made a motion to

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continue the hearing to November 17, 2022 at 7:30pm. Jim Burns seconded the motion. The vote was unanimously in favor of the motion by a roll call, Jim Burns, aye; Jaye Waldron, abstained; Joanne Ward, aye; Paul Willard, aye; Eve Wittenberg, aye; and Don Ritchie; abstained.

Respectfully submitted,

Liz Allard,
Land Use Administrator/
Conservation Agent

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The following Code does not display images or complicated formatting. Codes should be viewed online. This tool is only meant for editing.

Chapter 39
Hunting, Trapping, Firearms, and Explosives

[HISTORY: Adopted by the Annual Town Meeting of the Town of Harvard 3-7-1970 by Art. 31; amended 3-29-1975 by Art. 24. Subsequent amendments noted where applicable.]

§ 39-1 **Consent required for hunting, trapping or discharge of firearms or explosives on public or private property.**
[Amended 10-22-2018 STM by Art. 1]

A. No person shall hunt, trap, or snare game, fire or discharge any firearms or explosives of any kind within the limits of any highway, park or other public property, or Bare Hill Pond, without the permission of the Select Board; or on any private property, without the written a consent of the owner or legal occupant thereof; and such consent shall be carried at all times by such person and, upon request, it shall be shown to any police officer, game warden, or to any other local or state law enforcement official or to the property owner, legal occupant, or his/her agent.

B. For the purposes of this bylaw, regulations promulgated by state agencies having jurisdiction over public property within the Town specifically authorizing hunting and/or fishing thereon shall constitute written consent.

§ 39-2 **Exceptions**

A. This bylaw shall not apply to the lawful defense of life or property nor to any law enforcement officer acting in the discharge of their duties.

B. Person(s) legally licensed under MGL Chapter 131 hunting on public land owned or maintained by the Town, so long as written permission of the Town is granted; said written permission shall be carried with the person hunting at all times and, and, upon request, it shall be shown to any police officer, game warden, or to any other local or state law enforcement official or Town official.

§ 39-3 **Violations and penalties.**

A. Any police officer authorized to serve criminal process may arrest, without a warrant, any person found in violation of this section or any person whom said officer has probable cause to believe is in violation.

B. The penalty for violation of this section shall be a fine of not less than $250, nor more than $500, or imprisonment for not more than 30 days, or both.

Commented [WE1]: Specified written consent so that it can be carried on one's person

Commented [WE2]: Standard practice is to use "their" in place of "his/her" but I don't want to fight that battle

Commented [WE3]: I think town sentiment supports this though I have no data to prove that. Does raise question of shotguns as I think they're permitted for hunting by state on specific lands during specific seasons--maybe need to specify exceptions for specific activities permitted on state and federally-owned land (worded better than that). I'm not sure if C. covers all this already.

Commented [EA4R3]: C covers it and I will add shotguns to B

Commented [WE5]: I think this is unnecessary since the bylaw only specifies handguns and rifles (and potentially added shotguns). Town permission is for archery only which is not included in bylaw. So I'd omit B.

Commented [EA6R5]: 39-1A states hunting with permission of SB, which would include archery. My though here was for permission from the ConCom – I'll re-word. I also think it is stated again in other bylaws to hit home just because you have a hunting license doesn't mean you can hunt on town-owend land

Commented [WE7]: I prefer this option as it gives police more latitude, as the requested. I'd also raise penalty to $250 for first offence and $500 per offense thereafter--police specifically said the fine needs to be high to act as deterrent, and for a low fine such as $50 or $100 some will simply incur it as a cost of illegal hunting.

Commented [EA8R7]: Agreed – wait to hear what others have to say before making any edits.

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NATURAL RESOURCES

NATURAL RESOURCES

Climate Consideration

The Harvard Climate Action Plan will implement recommendations from the 2021 Apple Country Report. That report noted that the preponderance of land in Harvard in its natural state of forests, fields, and especially wetlands is the town's greatest asset in terms of sequestering and storing carbon. By far the greatest impact we can have in nature-based solutions to climate change and increasing resilience is to retain as much of this ecologically functioning land as possible and to minimize conversion to pavement, buildings, septic systems,or traditionally landscaped areas.

Harvard's Select Board, Planning Board, Zoning Board of Appeals, Conservation Commission, Open Space Committee, Parks & Recreation Commission, Board of Health, Water and Sewer, and Bare Hill Pond Watershed Management committees each have jurisdiction and a role in the oversight of land use in town and can have a significant impact on climate mitigation. Harvard Conservation Trust, Sudbury Valley Trustees and Nashua River Watershed Association also play a very significant role in the purchase and protection of major undeveloped lands. All of these entities working together should find ways to identify and significantly protect important carbon sequestration parcels as well as parcels that can meet the needs of agriculture and recreation.

Many of the town bylaws that protect these valuable resources are outdated and were not developed at a time when the impact of climate change needed to be reflected in the bylaws. The Conservation Commission's Wetland Protection bylaw and Planning Board's Open Space bylaw are places to start in order to conserve natural landscapes. Many surrounding towns are reviewing all of their bylaws in light of climate change and there is the ability for Harvard to learn from and utilize what they have developed.

NATURAL RESOURCES

Climate Goals & Actions

NATURAL RESOURCES

Municipal:

Goal: Increase the resilience of Harvard's ecosystems and community through the coordinated implementation of nature-based solutions.

Actions to Date:

- MVP Prioritization Plans
- 2021 Apple Country Report
- 2016 Open Space and Recreation Plan
- 2016 Master Plan, Chapter 3
- The Conservation Commission, Harvard Conservation Trust, Sudbury Valley Trustees and other local partners have helped to protect over 1,900 acres of conservation land directly and an additional 523 acres under conservation restrictions and agriculture preservation programs. In 2022, 75 acres was added to land holdings for the Community Harvest Project and surrounding land.

Climate Goals & Actions

Priority Actions to Implement	Target	Lead Committee/Entity
Preserve Harvard wetlands through the following: • Update the Harvard Wetlands Protection Bylaw and/ or regulations to reflect and adapt to changing climate conditions • Educate and advise residents on the management of private land near/in wetlands • Work with DPW to protect wetlands from road run-off	2025	ConCom
Amend erosion control by-law to include tree clearing	2025	PB
Address Invasive plants and insects: • Develop or expand programs for Bare Hill Pond, Town conservation land, and other municipally controlled lands where invasives are a risk • Educate and provide resources to residents to manage invasives on private land	2024	ConCom/BHPWM/DPW
Improve soil health through education and best management practices	2024	AAC
Improve habitat for pollinators and beneficial insects with protection and cultivation of native plants	2023	HCIC
Implement flood control through ranking and prioritization of town-owned culverts replacement and upgrades	2024	DPW
Monitor for water health, algae blooms and biodiversity of waterways. Provide education and outreach to the public regarding these issues.	ongoing	BoH/BHPWM

Land Use Goal: The Town's plans, policies, bylaws, and regulations encourage sustainable land use and development.

Actions to Date:

- Established an Open Space Residential Development Bylaw in response to 2002 Master Plan.
- Created a mixed-use overlay zoning district to facilitate smart growth.
- Land purchases by Conservation Commission, Harvard Conservation Trust and Sudbury Valley Trustees.
- Erosion Control Bylaw approved by Town Meeting 2021.

Climate Goals & Actions

Priority Actions to Implement	Target	Lead Committee/ Entity
Rewrite the Protective (Zoning) Bylaw and include • Local resilience and carbon reduction • More zoning districts that are sustainable and smart growth models • An updated Open Space Residential Development Bylaw that promotes open space and natural resource protection	2026	PB
Educate and inform the public about sustainable land use patterns	2025	PB
Include climate change and sustainability as a consideration in all future Planning Board, Zoning Board of Appeals, Parks and Recreation Commission, Conservation Commission, and Open Space Committee proposals and decisions	2023	SB
Ensure land use and transportation planning are coordinated	2028	SB/PB/TAC

Residential:

- **Goal: Reduce the climate impact of our homes and yards on the local environment.**

Actions to Date:

- HarvardEnergize information on native plantings
- Harvard Press Garden Column on environmentally friendly options

Climate Goals & Actions

NATURAL RESOURCES

Priority Actions to Implement	Target	Lead Committee/ Entity
Educate residents on sustainable practices for lawn care, landscaping, tree care, invasive species management, and water management during drought conditions	2024	HCIC/ConCom/BoH
Encourage the conversion of lawn care equipment from gas-powered to electric.	2025	HEAC

CLIMATE GOALS & ACTIONS

NATURAL RESOURCES

Measuring Progress

Measure	Baseline	Baseline Year	Target	Target Year
Wetlands updated bylaws complete	Existing bylaws	2022	Updated bylaws	2025
Amend bylaw re: tree clearing	Existing bylaw	2022	Updated bylaw	2025
Programs and education on invasives	Yearly garlic mustard pull	2022	Reduction in invasives	2026
Improved soil health	Current soil health – identify how to measure	2022	Improved soil health	2026
Improved habitat for pollinators	Current habitat- identify how to measure	2022	Increase in acres for pollinators	2026
Flood control via culverts	Current culverts status	2022	Culverts replaced where needed	2030
Protective bylaw rewrite	Existing bylaw	2022	Reviewed/updated bylaw	2026
Climate change part of decision-making	Not part of current decision-making	2022	Environmental assessment process and climate inclusion	2023
Land use and transportation coordination	Not currently coordinated	2022	Formal interactions in place	2023
Education of residents on sustainable practices	Some through HCIC newsletter	2022	Educational campaign	2024
Residential lawn-care electric equipment	Some in use. Volume unknown	2022	Capture and monitor growth in electric equipment	2025