Municipal Vulnerability Preparedness





Winter Webinar Series 2023 **#2: Heat Waves in a Changed Climate** 

# **MVP Program Updates**

- Winter webinar series
  - Webinar #2: Heat Waves in a Changed Climate: Planning for and Addressing Heat Islands
    - Wed, Jan 25 @ 10AM
    - https://MVP2023WinterWebinar2.eventbrite.com
  - Webinar #3: Findings of the 2022 MA Climate Change Assessment
    - Wed, Feb 1 @ 10AM
    - https://MVP2023WinterWebinar3.eventbrite.com
- Expression of Interest for FY24 action grant round now open
  - Final deadline Fri, Feb 3: <u>click here</u>to submit
- FY23 MVP Planning & Action grant round expected to open March 2023
  - \$21 million budget anticipated
  - Scheduling pre-RFR sessions soon, sign up for the newsletter to be notified
- <u>Sign up for our newsletter to stay up-to-date</u> on all this and more









# **MVP 2.0 Pilot**



#### We are excited to pilot a new MVP planning program starting this Spring! The new

MVP 2.0 program will provide communities with guidance and funding to:

- Expand their Core Team membership to center community members who will be most impacted by climate change
- Receive innovative virtual training on climate resilience best practices, equity, and environmental justice
- Reset priorities in their current MVP plans based on this new knowledge and engagement, and
- Receive technical assistance and guaranteed funding to develop and implement an action project.

Indicate interest on your municipality's Expression of Interest form for FY24 Action Grants or email your Regional Coordinator. Your RC will be happy to talk to you more about the opportunity and let you know when the application for the pilot round is open (expected April 2023).









- Housekeeping
- We're recording



• <u>Submit questions</u> <u>for presenters in</u> <u>our chat box</u>





- Call-in number:
- <u>+1-646-741-5292 (US)</u>





# Agenda for the Day

Introductions – Carolyn Meklenburg (MVP)

#### 1. MAPC Metro, Science-based regional heat adaptation planning

- \* Sasha Shyduroff, Senior Clean Energy and Climate Planner, MAPC
- \* Q&A

#### 2. Heat Resilience Solutions for Boston

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#### 3. Chelsea Heat Island Mitigation Project

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- Alan S. Manoian, Director of Community and Economic Development, Town of Ayer
- \* Beth Suedmeyer, Associate Planner, Devens Enterprise Commission



# Keeping MA Cool

#### **Preparing and Adapting for Climate Driven Heat**

Tuesday, January 25th, 2023, 10:30am EST





#### Metropolitan Area Planning Council (MAPC)



Sasha Shyduroff (She/her) Senior Clean Energy and Climate Planner, MAPC <u>Sshyduroff@mapc.org</u>



## Agenda

- Massachusetts is getting hotter and warmer- why should we care?
- State-wide and regional heat data
- Metro Mayors Climate Taskforce "Keeping Metro Boston Cool: A Regional Heat Preparedness and Adaptation Plan"



#### Climate Change is Happening Now

- Global temperatures are rising, causing local weather patterns to shift and become more unpredictable.
- "Climate Driven Heat" describes both the increase in extreme heat and the average warming of other seasons due to climate change.



Credit: Barcelona Supercomputing Center

### **Coastal Northeast is warming at a faster rate**

- The current that brings warm water from the tropics to Greenland is slowing down, increasing our offshore sea surface temperatures.
- This temperature change drives more weather from the warming ocean toward the coastal Northeast.



#### Extreme Heat Will Continue to Get Worse

- Average # of days over 90° historically: 11 days
- Average # of days over
  90° by 2030: 20 to 40
  days
- Average # of days over 90° by 2070: 90 days



Question: In what ways does extreme heat and rising temperatures impact your life or work?

#### **Impacts of Extreme Heat**

#### Health and Safety

- · Increase in illness and death
- · Exacerbate existing health conditions (particularly cardio-vascular diseases)
- $\cdot$  Increase in vector borne diseases

#### Infrastructure

- · Damage to bridges, roads, and public transit/rail
- · Overload of electricity grid to meet cooling needs
- $\cdot$  Damage and stress to natural systems including water, air, green space

#### Economy

- $\cdot$  Loss of work hours/worker health
- $\cdot$  Reduced performance for workers and school children







# What We've

#### Seen

Ninety degree days occurring earlier and more often. A rising toll of health effects. What does this say about climate change?

Ninety degree days are occurring earlier and now number twice the historical average

By Sabrina Shankman Globe Staff, Updated June 7, 2021, 7:46 p.m.



Cooling centers were open but few came. Are they the best way to deal with scorchers? and Camille Caldera Globe Correspondent, Updated June 8, 2021, 6:55 p.m.



Building manager Bill Miller at the Nazzaro Community Center cooling center on Tuesday, SUZANNE KDEITED/O

WEATHER We're likely experiencing a fourth heat wave of 2021 this week



Boston's 'heat islands' turn lower-income neighborhoods from hot to insufferable By David Abel Globe Staff. Updated June 22, 2021, 12:01 a.m. 🛛 f y 🖶 🗩 🛤

Four-year-old Jenasis Raper (left) ran into Rings Fountain wit Five Drownings Reported In Massachusetts Since Friday Kennedy Greenway Monday. JESSICA RINALDI/GLOBE STAF





ting." Richard Parritz said of his Hyde Souare neighborhood. "This is a health and equity issue." SUZANNE KREITER/GLOBE STAFF

'Sitting On A Time Bomb': Cambridge Housing Authority **Residents Sound Alarms About Lack Of AC** 

y Louisa Moller June 7, 2021 at 11:39 pm Filed Under: Cambridge News, Louisa Molle



Residents Await Relief From Heat After State Clarifies Law **Regarding AC In Public Housing** 





# Extreme Heat is a "Silent Killer"

- Extreme heat is deadly- causing more deaths than any other natural disaster in the US.
- Recent study showed that 37% of heatrelated deaths (globally across 732 locations studied) could be attributed to climate change.
- While everyone is impacted by extreme heat, some are more at risk than others from heat related illnesses and death.



#### **Existing Efforts to Address Heat**

# With extreme heat increasingly in the forecast, how can we adapt?

By Sabrina Shankman Globe Staff, Updated June 29, 2021, 8:30 p.m.



It's been a rough week for many in Chelsea, an urban heat island with plenty of pavement and little greenery. ERIN CLARK/GLOBE STAFF





## Mapping and Understanding Heat in Massachusetts

Legend

RPA Bou

Municipal Boundarie

Major Roads

#### **Urban Heat Island Effect**

## Heat impacts everyone- but not everyone is impacted the same.

**Urban Heat Island Effect:** Highly developed areas absorb more heat during the day and re-emit it overnight, which causes temperatures to be much hotter.

While urban areas experience this more, large developments and parking lots in suburban communities can have a similar effect.



### **Creating a Land Surface Temperature (LST) Index**



We created a Land Surface Temperature (LST) index that reflects persistent patterns in surface temperature- and the strength of urban heating by location.

- 1. Normalizing temperatures on single dates so that they fall across the same range and
- 2. Synthesizing the spatial patterns in surface temperature across many dates,
- 3. By Regional Planning Agency



### Urban Heat Data Sources



Landsat 8 illustration (credit: USGS)



Air Temperature WunderMap (credit: Weather Underground)



Measured Air Temperature



Satellite-derived surface temperature



Modeled Air temperature (credit: Wicked Hot Boston)

#### Land Surface Temperature (LST) is not Air Temperature



egrees F 87.25 - 81.65 88.82-88.95 88.87 00.94 90.87 - 91.75 64 77 - 92 66 67.67-93.95 13.57 94.82 94.85 - 98.44 96.45.99.90 08.07 - 102.0

Air temperature: 88F – 102F (14 Degrees)

Surface temperature: 66F – 140F (74 Degrees)

### How municipalities can use Land Surface Temp data

- ✓ Evaluate how prevalent urban heating effects are within the city or town
- Identify locations likely to produce elevated temperatures as a result of land cover composition
- Combine with indicators of greater heat sensitivity, health impacts, and limited adaptive capacity to prioritize locations for heat mitigation

# What can municipalities NOT learn from LST data?

Identify air temperature or exact air temperature patterns





**Keeping Metro Boston Cool: A Regional Heat Preparedness** and **Adaptation** Plan

## Building Resilience to Climate Driven Heat Driven Heat

- Intended to guide the heat- resilience work of municipalities, the Climate Taskforce, and partners.
- Public Health and Land Use Planning
- 2- year Municipal Vulnerability Preparedness (MVP) Action Grant to City of Cambridge and MMC.



CLIMATE SKFORCE



#### **Goals of the Plan**



Metro Mayors Climate Taskforce Metropolitan Area Planning Council

September 2022

- Manage and Reduce Risks Associated with Climate Driven heat
- 2. Improve Preparedness for Extreme Heat Events and Emergencies
- 3. Advance Climate Equity and Reduce Disparities within the Region
- Inform and Build Capacity to Prepare and Response to Climate Driven Heat at Municipal, Regional, and State Level

### **Roadmap for Action: Priority Strategies and Actions**

- Cool Communications
- Cool Communities
- Cooling Our Homes and Buildings
- Cooling Our Blocks
- Cooling Our Region
- Emergency Response



# Appendix

#### **Heat Definitions**

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4	5	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
5	0	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
5	5	81	84	86	89	93	97	101	106	112	117	124	1.30	137			
6	0	82	84	88	91	95	100	105	110	116	123	129	137				
6	5	82	85	89	93	98	103	108	114	121	128	136					
7	0	83	86	90	95	100	105	112	119	126	134						
7	5	84	88	92	97	103	109	116	124	132							
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Caution					Extreme Caution					<b>—</b> (	Danger		E)	treme	Dange	er	

- Air Temperature: describes how hot or cold the air is.
- Humidity: how much water vapor is in the air.
- Heat Index: describes how hot it feels based on air temperature and humidity combined.
- Land Surface Temperature: The temperature of surfaces including land, pavement, rooftops.
- Extreme Heat: In MA, days where temperature is over
   90 degrees F or heat index over 105.
- Heat Wave: In MA, three or more days over 90 degrees.

# Creating an up-to-date, composite surface temperature index

Surface Temperature Index: 20180719

We normalize pixel temperature in terms of where it stands between the highest and lowest surface temperature in MAPC on that day.

For the kth pixel, the surface temperature index is the average of this normalized value calculated for each day i across n total days meeting the criteria:

The Terrane Aller and a 20200505

Index at pixel 
$$k = \frac{1}{n} \sum_{i=1}^{n} \frac{(T_{i,k} - T_{i,min})}{(T_{i,max} - T_{i,min})}$$

Index = 0: Pixel temperature is identical to lowest pixel temperature on that day.

Index = 1: Pixel temperature is identical to highest pixel temperature on that day.

Index = 0.5: Pixel temperature is halfway between highest and lowest pixel temperatures on that day.

#### Creating a Land Surface Temperature (LST) Index

#### Why? Surface temperatures vary from day to day.



...and sometimes, pieces are missing.

#### Creating a Land Surface Temperature (LST) Index



By (1) normalizing temperatures on single dates so that they fall across the same range and (2) synthesizing the spatial patterns in surface temperature across many dates, we create a Land Surface Temperature (LST) index that reflects persistent patterns in surface temperature- and the strength of urban heating by location.



#### Using the LST index



#### Massachusetts LST index limitations:

#### Massachusetts LST index benefits:

- Reflects current (2018-2020) land cover effects on LST
- Captures persistent surface temperature patterns in space
- Covers all of Massachusetts
- Demonstrates urban heat effects generated by large urban areas through smaller concentrations of impervious cover
- Appropriate for heat mitigation work across a broad range of community types
- Each RPA region's LST index is created from a different set of satellite image dates
- LST index not directly comparable across RPA boundaries
- LST index is not a perfect guide to where air temperatures tend to be hottest



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## HEAT RESILIENCE SOLUTIONS FOR BOSTON

Preparing for the near-term and long-term impacts of extreme heat

В



**Climate Ready Boston** is our initiative to ensure that the residents of Boston can thrive in the face of climate change, both today and in the years to come.


## **BOSTON FACES MULTIPLE CLIMATE HAZARDS**



**CITY OF BOSTON** 



Heat Resilience Solutions for Boston (the Heat Plan) is a citywide framework to prepare Boston for hotter summers, with particular focus on Boston's environmental justice neighborhoods.

#### **CITY OF BOSTON**

## Provide framing for heat vulnerability and extreme heat risk in Boston

- Existing, ongoing, and related programs, policies, and projects
- Historical context for current day extreme heat conditions
- Future climate projections and mapping current extreme heat conditions

## Focus Neighborhoods

- Chinatown, Dorchester, East Boston, Mattapan, Roxbury
- Neighborhood context and community perspectives

## Citywide heat resilience strategies

- Vision for heat resilience in Boston
- Heat resilience goals and principles
- Implementation roadmap

## **CONTEXT OF EXTREME HEAT IN BOSTON**

#### A framework for factors of extreme heat risk



#### Climate modeling and heat mapping to inform strategies at multiple scales





### CONTEXT OF EXTREME HEAT IN BOSTON

Today, redlined areas face more extreme urban heat



#### **CITY OF BOSTON**

### CONTEXT OF EXTREME HEAT IN BOSTON

#### History shapes current day experiences



**CITY OF BOSTON** 

B

### COMMUNITY ENGAGEMENT AND STORYTELLING

#### Co-mapping surveys to identify characteristics of high heat areas



### COMMUNITY ENGAGEMENT AND STORYTELLING

The Heat Stories Comic Builder: a tool for sharing and learning about extreme heat experiences.

#### Welcome to the Boston Heat Resilience Open House

Spanish, Mandarin, and Cantonese interpretation is available for this meeting. Please select your preferred language option at the bottom of the screen by clicking on the globe symbol.



Join in the fun



https://experience-comic.web.app

Unlock

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Developing a Community Advisory Board (CAB)

- **Purpose and role** within the project
- **Composition** of the CAB
- **Compensation** of CAB Members
- Keeping the CAB **engaged throughout** the planning process

### **HEAT RESILIENCE STRATEGIES**

Boston's heat resilience strategies address three critical factors of heat risk

#### **HEAT EXPOSURE**

The amount of heat people, the environment, systems, or other elements experience or are subject to. Exposure considers both heat intensity and duration.

#### **HEAT SENSITIVITY**

The degree to which people, the environment, systems or other elements are affected by exposure to heat.

#### **ADAPTIVE CAPACITY**

The ability to adjust to climate change, to moderate potential damages, to take advantage of opportunities, or to cope with consequences.

### **DEVELOPING THE HEAT RESILIENCE STRATEGIES**

25 heat resilience strategies to increase access to resource and reduce localized extreme temperatures.



## **PLANNING FOR ACTION**

Implementing projects during the planning process and catalytic projects

- Cool Spots Cooling outdoor community spaces
- Extreme Temperatures Response Task Force
- Cool Roof Grant Program
- Water mister and fountain installation at Chin Park
- A/C and fan distribution
- Pop-up Cooling Kit Program



Cool Spot at East Boston Public Library





## Zoe Davis

Climate Resilience Project Manager for the City of Boston

zoe.davis@boston.gov

Please feel free to reach out by email if you have any questions or thoughts you want to share.

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### URBAN HEAT MITIGATION PILOT PROJECT CITY OF CHELSEA DEPARTMENT OF HOUSING & COMMUNITY DEVELOPMENT

ONLY BIKE BUS R



## Chelsea- A Melting Pot for Over a Century

THE SQUARE, CHELSEA, MASS.

## Social and Environmental Inequity- Stressors on a Gateway City





# Preparing for Extreme Heat



In fiscal year 2020, the City of Chelsea sought funding to advance a city-wide urban heat island mitigation initiative through the Executive Office of Energy & Environmental Affairs, Municipal Vulnerability Preparedness Action Grant Program.

## Urban Heat Mitigation Pilot Project



### **Objectives of Project:**

- complement ongoing regional efforts by analyzing ambient air & land surface temperatures
- perform a social vulnerability assessment
- prioritize corridors for public and private heat mitigation interventions
- devise and carry out a pilot heat mitigation projects on public properties

## URBAN HEAT ISLAND ANALYSIS RESULTS

The City of Chelsea procured a consultant to assist with the development, design and implementation of UHI mitigation strategies in collaboration with local community-based organization, GreenRoots. Data from the ongoing C-HEAT project sensor network were used as part of the urban heat island analysis.





## Heat Variability Index across Chelsea for a 90 degree. 95 degree and 100 degree Day



## IDENTIFIED HEAT ISLANDS THROUGHOUT CHELSEA



Figure 3. Known (red boudaries) and emerging (orange boundaries) "hot spots" in the City. Locations marked with green are chosen to be the high priority areas to employ heat mitigation strategies.



## URBAN HEAT MITIGATION IMPLEMENTATION

## Cool Block Project





## Heat Mitigation Strategies Utilized

Planted Shade Trees along Cool Block

Installation of several bioswales

Renovated Sidewalks with lightly colored aggregates

Blast treatment of Roadway





## Roadway Blast Treatment

 Pavement around the cool block area was blast treated to remove the top layer of asphalt, to decrease pigment, in order to decrease absorption of solar energy.



Next Steps....

- Negotiating the installation of a white roof at the Boys and Girls Club, to complement Cool Block Project.
- Design and creation of new open space within the Cool Block.
- Replicate Urban Heat Mitigation strategies in other identified heat islands throughout the City.

## **Questions**?

Contact Information: City of Chelsea Department of Housing and Community Development

Hilary Dimino Senior Planner/Project Manager & City Tree Warden hdimino@chelseama.gov 617-466-4193



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## **Ayer + Devens Pocket Forest Project**

MVP Winter Webinar #2: Heat Waves in a Changed Climate

## Ayer + Devens Pocket Forest Project Team





#### Layer: Hotspots

A statewide Land Surface Temperature (LST) Index was created by combining estimates of surface temperature from days in 2018, 2019, and 2020 where the high air temperature exceeded 70 degrees Fahrenheit. Hot spots are areas with the 5% highest LST Index values within each RPA region.

https://eeaonline.eea.state.ma.us/ResilientMAMapViewer/



# Project Location














P7521 East Main Street, Ayer, Mass.

Photo Underwood & Underwood. N. Y

















































Urban Heat island Severity for US Cities (2019): Trust for Public Land



## Municipal Vulnerability Preparedness Program Planning to Action



#### CLIMATE CHANGE

Harvard, Bolton, Devens

Nashua Watershed Basin Hurved Ridde Nakar Anthu, Aw Boten, Boyaton, Onton, Dunatakin, Fetcharg, Gender, Hurved Ridde Nakaratin, Lancater, Leonstrate, Lancharg, Patra Propend, Proston, Raiter Alban, Sheng, Bernard, Waterbarg, Waterbarg, Waterbarg, Karl

More Annual Precipitation and Inland Flooding

Global warming is caused by the accumulation of greenhouse gases within the atmosphere. Gases that contribute to the greenhouse effect include water vapor, carbon dioxide, methane, and nitrous oxide. On earth, human activities such as burning fossil fuels, land deforestation and wetland loss/conversion have altered the delicate balance of atmospheric conditions that regulate our climate. The effect of these changes cause global climate change that are likely to be significant and to increase over time.

#### **EXTREME TEMPERATURES**



#### What can we expect as CLIMATE CHANGES?

Climate change has already had observable effects on the environment. Rising temperatures, changes in precipitation patterns, droughts and heat waves, sea-level rise, and extreme storm events have altered the distribution of risk and



| APPLE COUNTRY                                                                                                   | The following are a list of Nature Based Solution types (NBS) that may be ap-<br>plicable to the locations, or parts there of, identified in the public outreach and                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | The following Data layers are shown on the a<br>included here to identify physical and political                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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|                                                                                                                 | Ecosystem Enhancement/ Restoration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | The second second second second second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| DEVENS)                                                                                                         | <ul> <li>Invasive species managment (identification, removal and replacement of harmful species)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Apple Country Study Areas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                                                                 | <ul> <li>River/ pond bank revegetation (creation of slopes features and preferred vegetation)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                 | <ul> <li>Grasslandimeadow management restoration (introduction and maintenance practices)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                 | <ul> <li>Forest Smuthane neath management resteration (Species additions and removals)</li> <li>Wolfand management indecation (Emrine control microdemented and connectated)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| JVERVIEW NOTES & LEGEND:                                                                                        | <ul> <li>Medine manufactore Strin (buffering organ aroun with birth value trans or forbur)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 11 A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                                                                                 | <ul> <li>Habitat onhancements (nesting foraging and hunting features)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Hydrography                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| he goal of this section of the report is to locate sites                                                        | <ul> <li>New wetland or flood plain construction/ expansion (micro damming and chanaling)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| or potential Nature Based Solutions. As you examine                                                             | <ul> <li>Pond creation/ alteration (creation expansion or shaping of ponds)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| no stas crime or what opportunities for improvement                                                             | <ul> <li>River flow alteration (adding smuosity, erosion control, planting and aeration teatures)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| al outcomes.                                                                                                    | <ul> <li>Species monitoring protocol (scaming and technical support for inventory and monitoring)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Protected & Permational Onen Cosco                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                                                                 | Built Environment Best Management Dractice (BMD)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | ribucted a Recreational Open Space                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Catogories of NBS Approaches to consider:                                                                       | <ul> <li>Stormwater treatment wefands (temporary impoundment and treatment of storm water)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Mairial Owner Once Seaso                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| a de la compansión de la c | <ul> <li>Upstream BMPs (Rain garden, bio-swale vogetated buffer, swale, etc.)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | manicipal comiter open space                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| cosystem restoration approaches                                                                                 | <ul> <li>Shade-habitat/intitration tree plantings (Canopy shade trees over lawn and pavement)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Onen Spare                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Ecological resolution                                                                                           | <ul> <li>MSCS culvert improvement (Higher wider culverts with passable banks and chanel)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | and appropriate the second sec |
| Forest landscape restoration                                                                                    | <ul> <li>Dam wer smart controls (Channel modifications for gradual passage of water)</li> <li>Denious parking walking sense (Stabilized paganus access and activity in the erit</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                 | <ul> <li>Almel aniatic investigations treatment (Chemical cultural mechanical solutions)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Assessor's Parcels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ssue-specific ecosystem-related approaches                                                                      | <ul> <li>Species crossing protections (Signage, light, fences, audible surfacing)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ecosystem-based adaptation                                                                                      | <ul> <li>Beaver Deceiver Premoter (structures to prevent fixed damage or improve flood plain)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ecosystem-cased mitigation                                                                                      | b Metal Marcola Marcola Marcola Marcola Developer and Marcola Marcola<br>Marcola Marcola Marcol<br>Marcola Marcola M<br>Arcola Marcola M<br>Arcola Marcola Marc |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Ecosystem based disaster risk reduction                                                                         | Ecological Awareness & Access Projects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                 | <ul> <li>Educational interpretation (Signage, events, digital media, arts and other ecological into)</li> <li>Exemptional endocrine among (Bublic extension among for any mental approximate)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | MADEP Wetlands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| nfrastructure-related approaches                                                                                | <ul> <li>Soft trail (Stabilized satural surface and terrain trails)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Natural infrastructure                                                                                          | <ul> <li>Paved Trail (Durable universal access surface trails or other access)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | MADEP Open Water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Green intrastructure                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| countern based management areasochan                                                                            | Related Regulatory Actions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | MADEP Wetlands                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Integrated coastal zone management                                                                              | <ul> <li>Conservation Purchase/restiction (Conservation trust, direct purchase)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Integrated water resources management                                                                           | <ul> <li>Public - private partnership (Sponsored managed private plantings)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | COMPANY AND A DESCRIPTION OF A DESCRIPTI |
| S                                                                                                               | <ul> <li>Land swap rand bank (biwekepmentingits transfer Use detertal)</li> <li>Tenting configure allow consistence (Development limits, estimate limits)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FEMA Floodplain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| convision protection approaches                                                                                 | <ul> <li>Design and provide the regulation (contraction of the regulation contraction)</li> <li>Design and provide the regulation of the regulation of the regulation contraction of the regulation of the regilation of the regulation of the</li></ul>        | and the second state of the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| renterted area management                                                                                       | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 100yr Hoodplain                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| h-mmm man manakangan                                                                                            | Related Architectural Projects to Consider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Story Devidelate                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| risit IUCN.org for more detailed descriptions and fur-                                                          | · Green architectural enhancements (green wall, green roaf, white roof, water harvesting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | and another and an and an                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| her resources                                                                                                   | etc.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                 | Course another best and the billing the developing the many the of the best second                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |



bown on the area mans al and political boundwer) for more detail.



## Ayer + Devens Pocket Forest Project

## Ayer + Devens Neighborhood Pocket Forest Project Overview & Goals

#### Year 1:

Community engagement

- Design & Construct a FY23 Pilot Pocket Forest Project
- Select Potential Neighborhood Sites for FY24 Project Phase II
- Establish monitoring and maintenance Team and documentation
- Outreach/Engage ongoing education and community participation

### Year 2 & 3:

- Design & Install additional Pocket Forests on selected neighborhood sites
- Development of additional Local Community Educational Materials
- Neighborhood Pocket Forest monitoring & maintenace program



PROJECT

# What is a Pocket Forest?

A small designed, curated, and managed patch of forest in an urban or suburban space.



#### Composition:

- **Trees**: seed, nectar, and larval host, and soil building species
- **High Forage**: understory trees, shrubs, and woody groundcover
- Wild annuals/biennials
- **Soil**: fungal inoculation

# Composition of a Pocket Forest: Small but powerful!

- Dense Plot: ~600 trees/plants in a small area (~2,800sf), maximizing benefits per SF of land.
- **Nutrient-rich soils:** supporting accelerated forest development.
- **Pesticide-free:** No chemicals or fertilizers
- Low management and maintenance: after first 2 years.
- **Rich biodiversity:** capable of attracting over 500 animal and plant species within the first 3 years.
- Green space/outdoor classroom: for people to reconnect with nature.
- Climate benefits: enhanced carbon capture through plants and soils.



## What are the Benefits of a Pocket Forest?



Danehy Park Miyawaki Forest. Cambridge, MA. Photo: D. Kuznik
### **Benefits of Urban Trees**

Research has linked the presence of urban trees to ...





# Choosing Neighborhood Pocket Forest Sites

#### Criteria:

- $\rightarrow$  Air Quality
- ightarrow Water Quality
- $\rightarrow$  Cooling
- Demographic/Neighborhood Climate Vulnerability
- → Mental/Physical Well-Being
- → Community Engagement

#### AYER-DEVENS POCKET FOREST DATA VIEWER https://bit.ly/Pocketforestdataviewer





#### Layer: Land Surface Temperature Index - MRPC



This **LST Index Data Layer**, covering the area served by the Montachusett Regional Planning Commission, illustrates **patterns in surface temperature** within each Regional Planning Agency region. Areas with LST Index values below 0.5 tend to be cooler while areas with LST Index values over 0.5 tend to be warmer. The LST index was constructed in thirteen separate pieces, each corresponding to a Regional Planning Agency (RPA) region. Index values should not be compared across different RPA regions.





#### <u>Ayer Prospective Locations – Pilot Pocket Forest</u>

- St Mary's Church Surface Lot, Shirley Street
- Depot Square, Main Street Downtown Ayer
- East Main Street/Railroad Bridge Green Slope



Nashoba Associated Boards of Health

### Ayer Potential Pocket Forest Locations:



### Ayer Potential Pocket Forest Locations:



### **Devens Potential Pocket Forest Locations:**





## How to Pocket Forest

- 1. Site Clearing
- 2. Landwork and Site Access
- 3. Soil Building
- 4. Water and Ground Cover Planting
- 5. Monitoring and Maintenance







## Next Steps

- 1. Finalize Pilot Project location, design, and installation
- 2. Develop local Outreach and Education Tools
- 3. Future Neighborhood Site Selection process (finalize)
- 4. Conduct Permitting Assessments
- 5. Design Plans and Plant Lists for prospective sites

#### **Opportunities to Participate**

- 1. Pilot project design and construction
- 2. Harvesting/planting days
- 3. Educational activities
- 4. Monitoring and maintenance



#### For More Information:



climate resilience and increase the quality of life by planning, designing, and installing pocket forests through the Ayer Devens Main Streets Regional Pocket Forests project. These forests will better connect people with nature and reduce impacts of climate change by reducing urban heat-Island impacts, improving air quality, reducing flooding through increased rainfail capture and inititation, and providing accessible greenspace.

The Ayer Devens project is funded through the Massachusetts Municipal Vulnerability Preparedness (MVP) Action Grant program The project implements recommendations from the Apple Country Natural Climate Solutions Project, (a previous MVP Action Grant project) to support long term resilience to the impacts of climate change in the region



Pocket Forest Project Website <u>https://climateresilient.wixsite.com/ayerdevens</u>



### Thank You!

Alan S. Manoian, Town of Ayer Director of Community and Economic Development <u>amanoian@ayer.ma.us</u> (978) 772-8220

Beth Suedmeyer, Devens Enterprise Commission Associate Planner <u>bethsuedmeyer@devensec.com</u> (978) 772-8831 Ayer-Devens POCKET FORESTS PROJECT

Pocket Forest Project Website https://climateresilient.wixsite.com/ayerdevens