

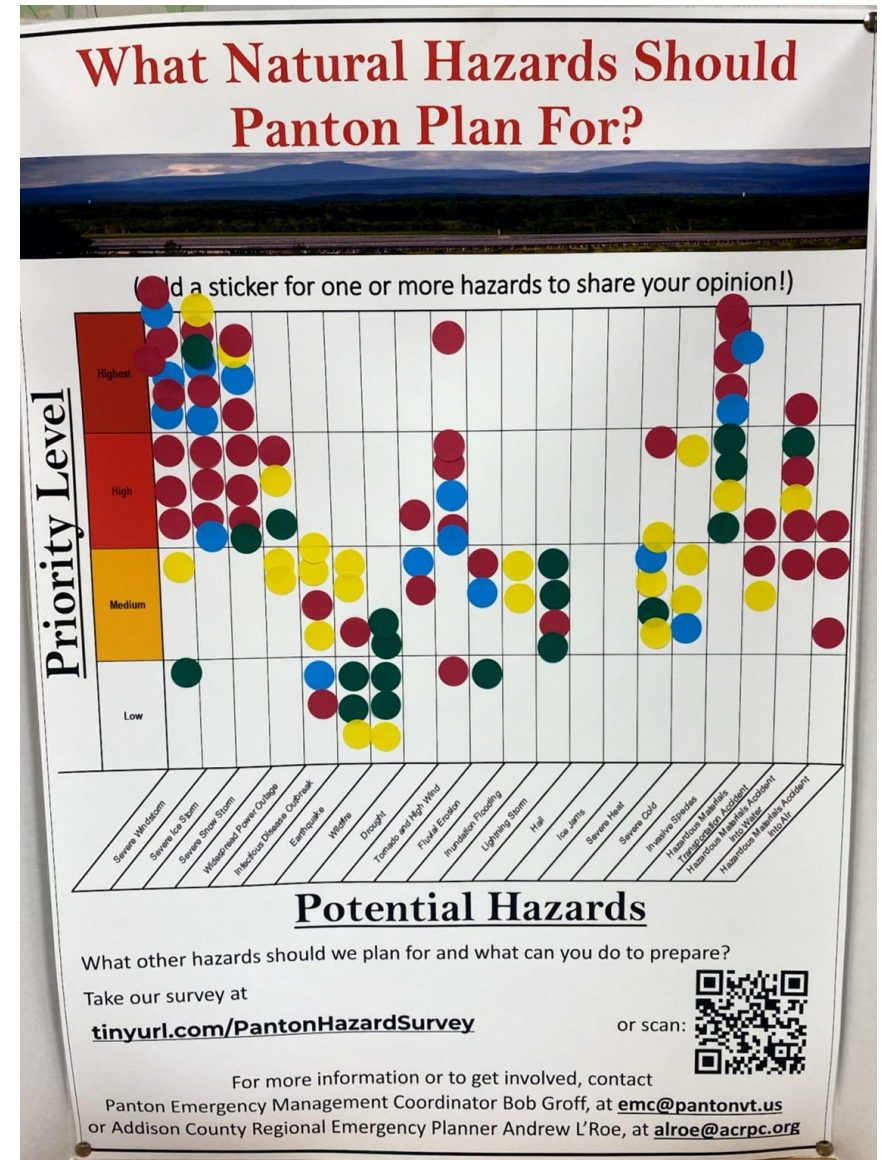
# Hazard Mitigation and Trees: Why you should be involved and opportunities for integration of goals and actions

Caroline Paske  
State Hazard Mitigation Planner  
Vermont Emergency Management



# What is a Local Hazard Mitigation Plan?

- Hazard mitigation is any sustained action taken to reduce or eliminate long-term risk to people and property due to natural or man-made disasters. i.e., adaptation.
- Hazard mitigation planning is assessing potential hazard impacts in your community, making an inventory of existing capabilities, and coming up with a realistic strategy to reduce impacts on the people and community.

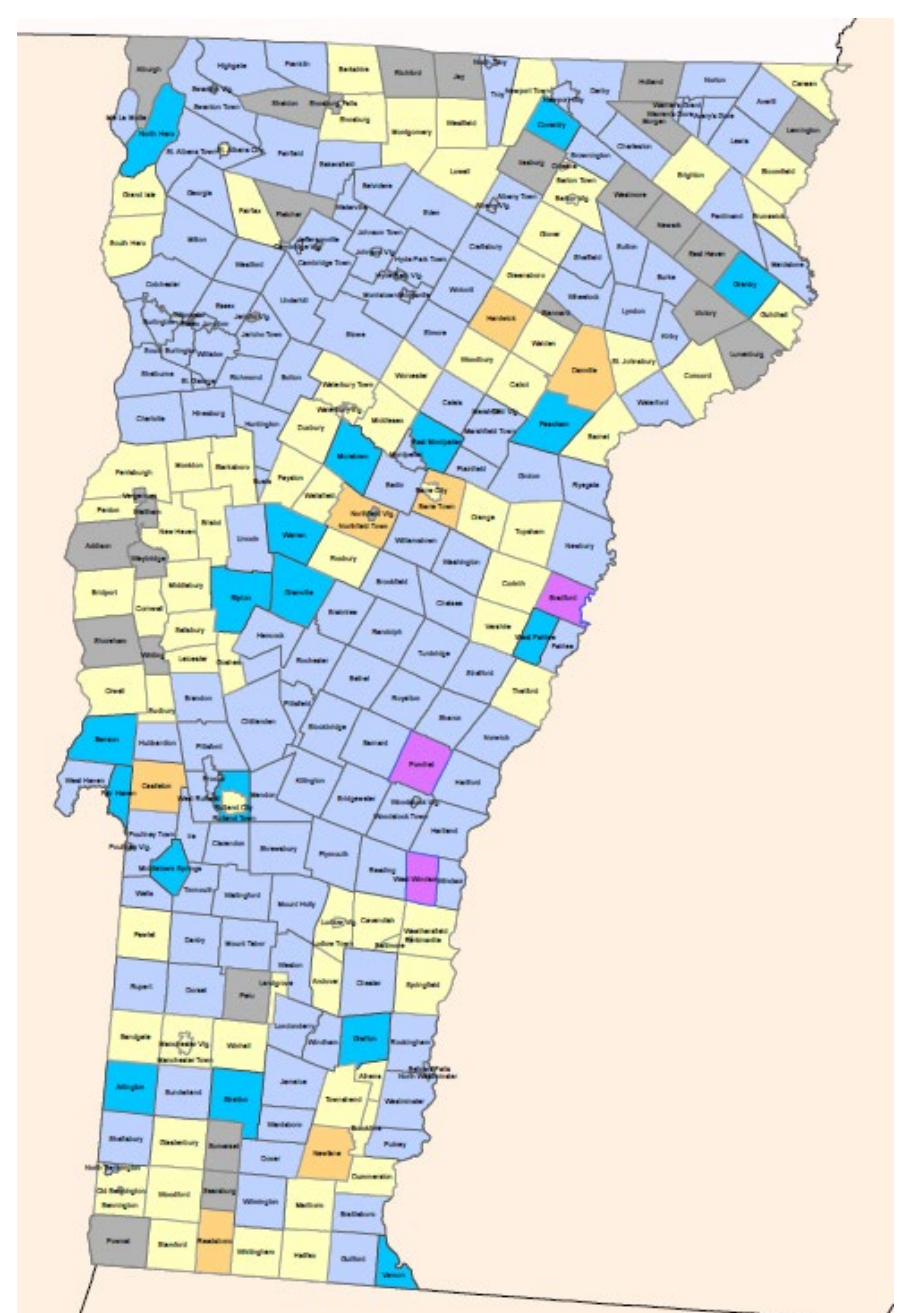


# What is a Local Hazard Mitigation Plan?

- State and local governments are required by FEMA to have a hazard mitigation plan to access hazard mitigation funding.
- Expire after 5-years and must be updated and FEMA-approved.

## Legend

■ No Plan	■ Approved, not expiring within 1 year
■ In Review by FEMA	■ Approved, expiring within 1 year
■ Awaiting Revisions	■ Expired



# Why do communities develop a plan?

- Community Resilience
  - Create the community's "wish list" for projects and initiatives.
  - Build working relationships between the public, all stakeholders, leaders, regulators, and technical experts.
- Access to hazard mitigation grants
- Emergency Relief & Assistance Fund (ERAF) Incentive Program
- Allow for adoption of flood regulations



# Where are trees relevant in the local hazard mitigation plan?



Throughout! Starting with the community profile.

# Structure of the Plan



Planning Process – Documenting who was involved and how it was developed



Risk Assessment – What hazards can impact where we are? What will those impacts be? What can we expect with climate change?



Mitigation Strategy – What actions should we take to mitigate our risk to hazards? (These are the projects you apply for funding to implement)



Plan Maintenance and Update – Is our plan working?

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# Element A Planning Process Requirements

- Who was involved?
  - The Tree Warden and related natural resource experts and stakeholders
- Existing plans, studies, reports, and technical information review in the development of the plan
  - E.g. tree inventories, forest management plans, tree ordinances, ongoing planning and data related to street trees and forested areas.





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# Element B: Risk Assessment Requirements

- The impact of each hazard on the natural environment, including trees, is relevant to the planning process.
  - Wind and ice damage to trees and consequent infrastructure damage or drought affecting health of trees and wildfire risk.
- Consideration of how climate change and land use changes will change the impact of hazards on trees is an important component of communities and the natural environment.



# Hazard Assessment from the 2023 SHMP

**Table 3: Hazard Assessment**

Hazard Impacts	Probability	Potential Impact					Average:	Score*:
		Built Environment	People	Economy	Natural Environment			
Fluvial Erosion	4	4	4	4	4	4	16	
Inundation Flooding	4	4	4	4	2	3.5	14	
Heat	4	2	4	3	2	2.75	11	
Wind	4	3	2	2	2	2.25	9	
Snow	4	2	3	2	1	2	8	
Ice	3	2	3	3	2	2.5	7.5	
Drought	3	1	3	3	3	2.5	7.5	
Infectious Disease Outbreak	3	1	4	4	1	2.5	7.5	
Cold	3	2	3	2	2	2.25	6.75	
Invasive Species	3	2	1	3	3	2.25	6.75	
Landslides	3	3	2	1	2	2	6	
Wildfire	2	3	3	3	3	3	6	
Earthquake	2	2	2	2	2	2	4	
Hail	3	1	1	2	1	1.25	3.75	

\*Score = Probability x Average Potential Impact

# Hazard Impacts:

**Table 13: Hazard Assessment Ranking Criteria**

	<b>Frequency of Occurrence:</b> Probability of a plausibly significant event impacting the community or regional scale based on previous occurrences and climate change projections.	<b>Potential Impact:</b> Severity and extent of damage and disruption to built and natural environments, people, and the economy
<b>1</b>	Unlikely: <1% probability of occurrence per year	Negligible: isolated occurrences of minor built or natural environmental damage, potential for minor injuries, health, or well-being impacts, or minimal economic disruption.
<b>2</b>	Occasionally: 1–10% probability of occurrence per year, or at least one chance in next 100 years	Minor: isolated occurrences of moderate to severe built or natural environmental damage, potential for injuries or health or well-being impacts, minor economic disruption.
<b>3</b>	Likely: >10% but <75% probability per year, at least 1 chance in next 10 years	Moderate: severe built or natural environmental damage on a community scale, injuries, fatalities or impacts to individual and community well-being, short-term economic impact.
<b>4</b>	Highly Likely: >75% probability in a year	Major: severe built or natural environmental damage on a community or regional scale, multiple injuries or fatalities or severe long-term impacts to individual and community well-being, significant long-term economic impact.

# Risk Assessment -> Mitigation Strategy

What impacts will the natural hazards have on the environment?

- Will flooding worsen the spread of invasive species such as knotweed?
- Will heat stress our trees?

How will the environment prevent some of the worst impacts?

- How much potential floodwater will our forests capture and store?
- How will trees make the hottest days more bearable?

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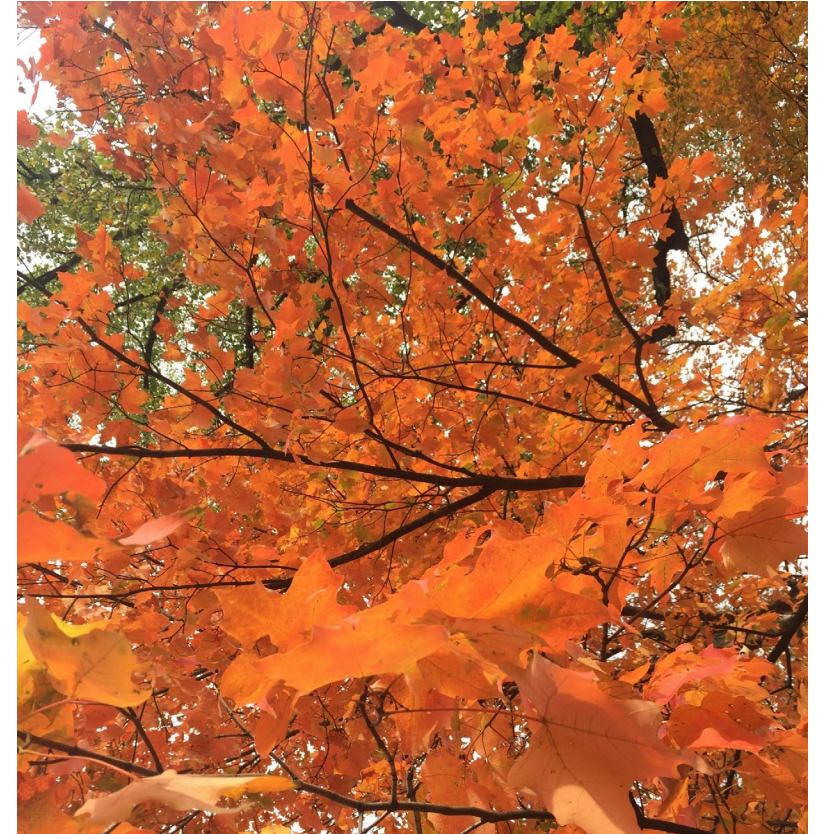
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# Element C: Mitigation Strategy Requirements

- Document the municipality's existing authorities, policies, programs, and resources that relate to implementing hazard mitigation. To include:
  - existing funding sources;
  - land use and development ordinances or regulations
- Must consider natural resources protection actions in the mitigation strategy
- Must consider planning and policy actions in the mitigation strategy (ex. Implementing tree ordinances)



# Mitigation Strategy

- Every LHMP mitigation strategy must have at least one natural systems protection action considered for prioritization.
- There are more resources on utilizing nature-based strategies available to guide the planning team every year:
  - FEMA's [Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities](#) provides mitigation ideas for protecting and better integrating natural systems in our built environment. In March 2023 FEMA released the second guide in the series titled [Building Community Resilience with Nature-Based Solutions: Strategies for Success](#).
  - The [International Guidelines on Natural and Nature-Based Features \(NNBF\) for Flood Risk Management](#) provide practitioners with the best available information concerning the conceptualization, planning, design, engineering, construction, and maintenance of NNBF to support resilience and flood risk reduction for coastlines, bays, and estuaries, as well as river and freshwater systems.



# Mitigation Strategy

- Continued NBS resource list
  - [Floodplain Buyouts: An Action Guide for Local Governments on How to Maximize Community Benefits, Habitat Connectivity, and Resilience](#) publication was produced by the University of North Carolina-Chapel Hill's Institute for the Environment and the Environmental Law Institute.
  - The Environmental Law Institute (ELI) provides guidance based on their studies of utilizing nature-based solutions for hazard mitigation projects, learn more on the [ELI Hazard Mitigation Planning](#) site.
  - [Naturally Resilient Communities](#) is a partnership amongst multiple organizations to produce a guide of nature-based solutions and case studies from across the country. The website contains a number of case studies and related resources on nature-based solutions.
  - [Promoting Nature-Based Hazard Mitigation Through FEMA Mitigation Grants](#) produced by AECOM on behalf of TNC is a publication intended for stakeholders pursuing FEMA HMA grants for nature-based solution to mitigation risks associated with flooding and wildlife.

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# Elements D and E

- Identify the process to integrate the local hazard mitigation plan into other planning mechanisms, such as natural resources management plans and local bylaws.
- The plan must reflect changes in development, land use, and local priorities.
  - Are trees part of your community's priorities?  
Are there development pressures or fear of trees influencing town decisions?



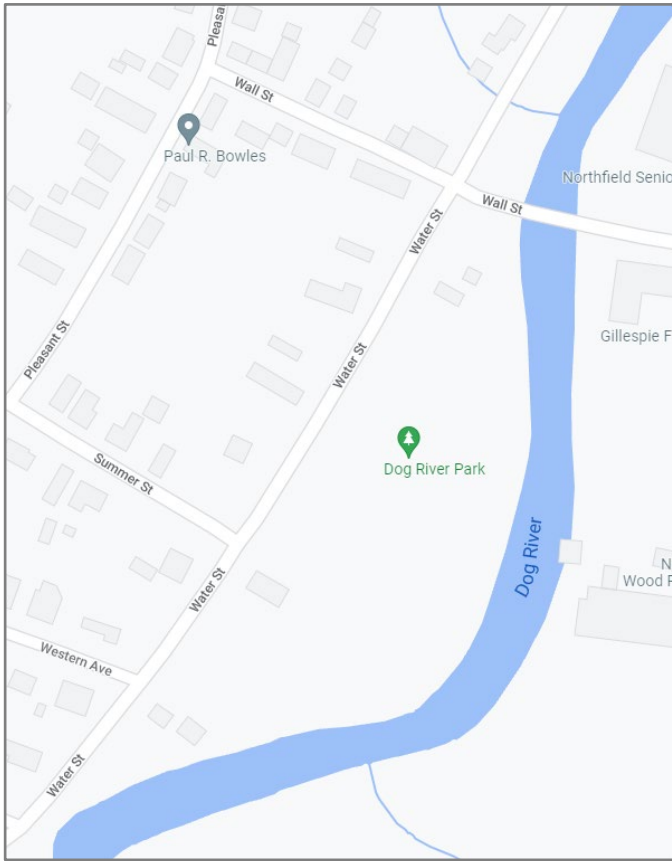
# Hazard Mitigation Funding

## FEMA and Nature-based Solutions Funding

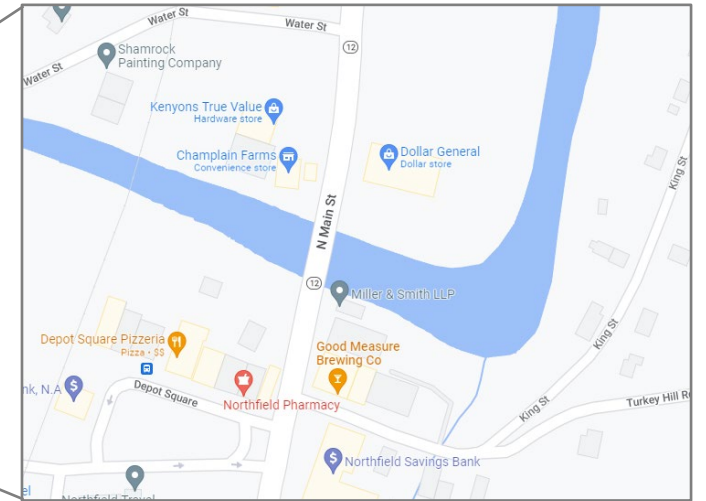
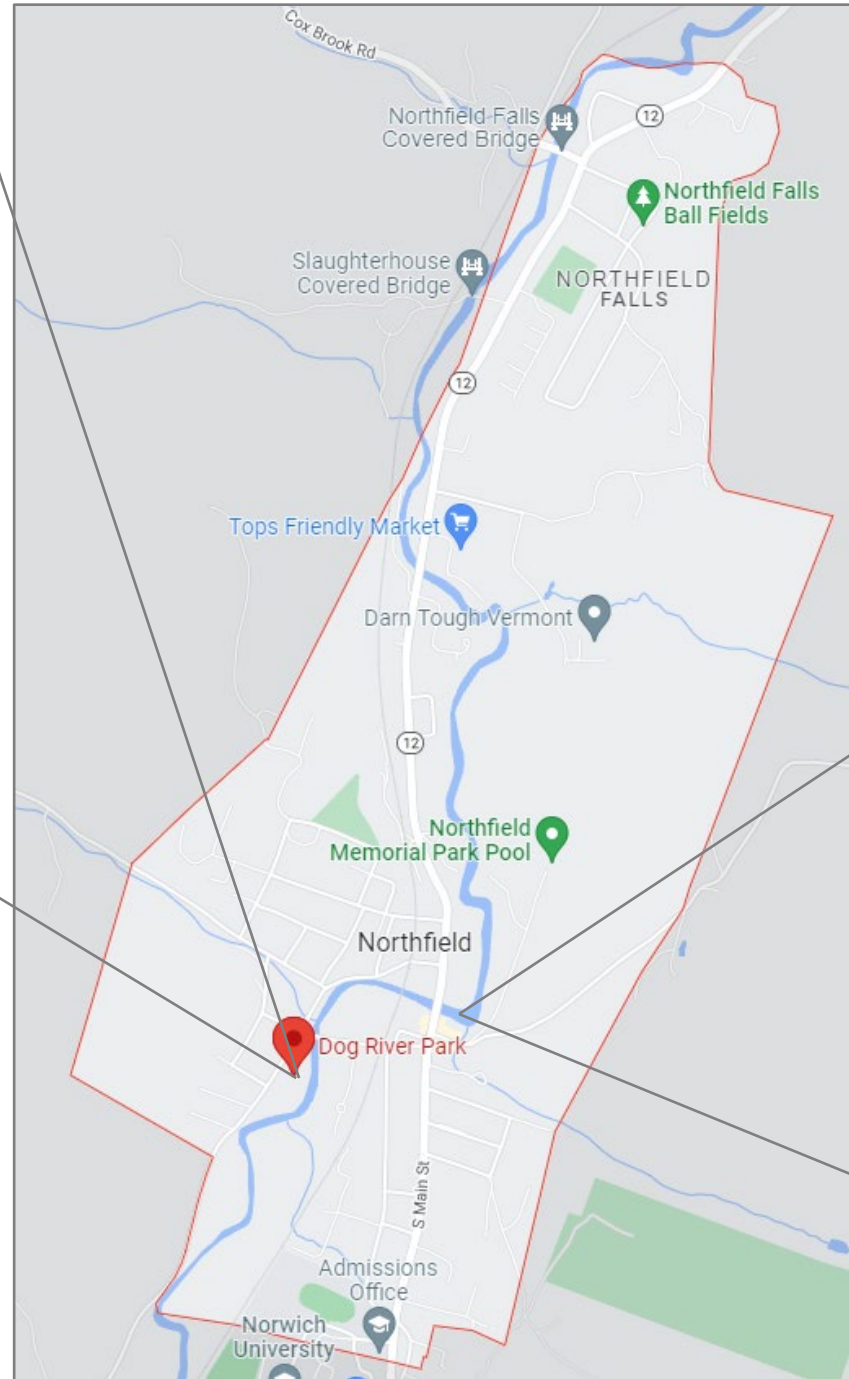
- The **BRIC (Building Resilient Infrastructure and Communities)** program's guiding principles include ... encouraging and enabling innovation, including multi-hazard resilience or nature-based solutions; ... enabling large, systems-based projects;...
- FEMA will prioritize requests that focus or incorporate nature-based solutions
- In the evaluation process of application projects that include nature-based solutions get 5 more points
- Nature-based solutions: FEMA defines nature-based solutions as sustainable planning, design, environmental management, and engineering practices that weave natural features or processes into the built environment to build more resilient communities and mitigate the impact of climate change. Sometimes referred to as green infrastructure.
- Annual application period through VEM

# FEMA and Nature-based Solutions Funding

- The **HMGP (Hazard Mitigation Grant Program)** can be utilized for and floodplain restoration. It is a slightly more restrictive than BRIC.
- Restoring natural floodplain access to improve ecological floodplain function.
- Natural infrastructure and nature-based solutions for flood storage, flood protection, or improved floodplain and river functions.
- Green infrastructure and low-impact development to manage stormwater and reduce future flooding.
- Amount available depends on disaster declarations in Vermont.
- Open now! <https://vem.vermont.gov/disaster-based-funding>
- Towns and other eligible applicants seeking funding for hazard mitigation projects must complete the Pre-Application Form by June 21, 2024.



Water Street Neighborhood  
Buyouts, Restoration &  
Community Park



Cross Brothers Dam Removal &  
Floodplain Restoration

# Northfield



Property Buyouts and Floodplain Restoration



# Dog River Park





Cross Brothers Dam Removal & Restoration



Cross Brothers Dam Removal & Restoration



**Wildlife  
Habitat**

**Local Climate  
Moderation/ Cooling**

**Air  
Filtration**

**Carbon  
Sequestration**

**Wind  
Abatement**

**Beauty/ Sense  
of Place**

**Real Estate  
Value**

**Mental Health**

**Shade**

**Noise  
Abatement**

**Erosion  
Control**

**Stormwater  
Retention**

**Water  
Quality**

**Soil Health**

# Conservation is Planning

- Communities can inventory and celebrate the natural assets they already have through planning processes.
- Highly beneficial natural features and ecosystem services must be protected to avoid development and impairment.
- Consider properties along waterways or other hazard prone areas, and properties that support the whole system – think headwater storage and intact forest blocks.



A photograph of a snowy forest. The ground is covered in a thick layer of white snow, with shadows cast by the trees and bare branches. Several tree trunks are visible, some in the foreground and others in the background. The scene is bright, suggesting a sunny day.

Thank you!

Reach out - [caroline.paske@vermont.gov](mailto:caroline.paske@vermont.gov)