



# Vermont Hazard Mitigation Planning and Nature-based Strategies

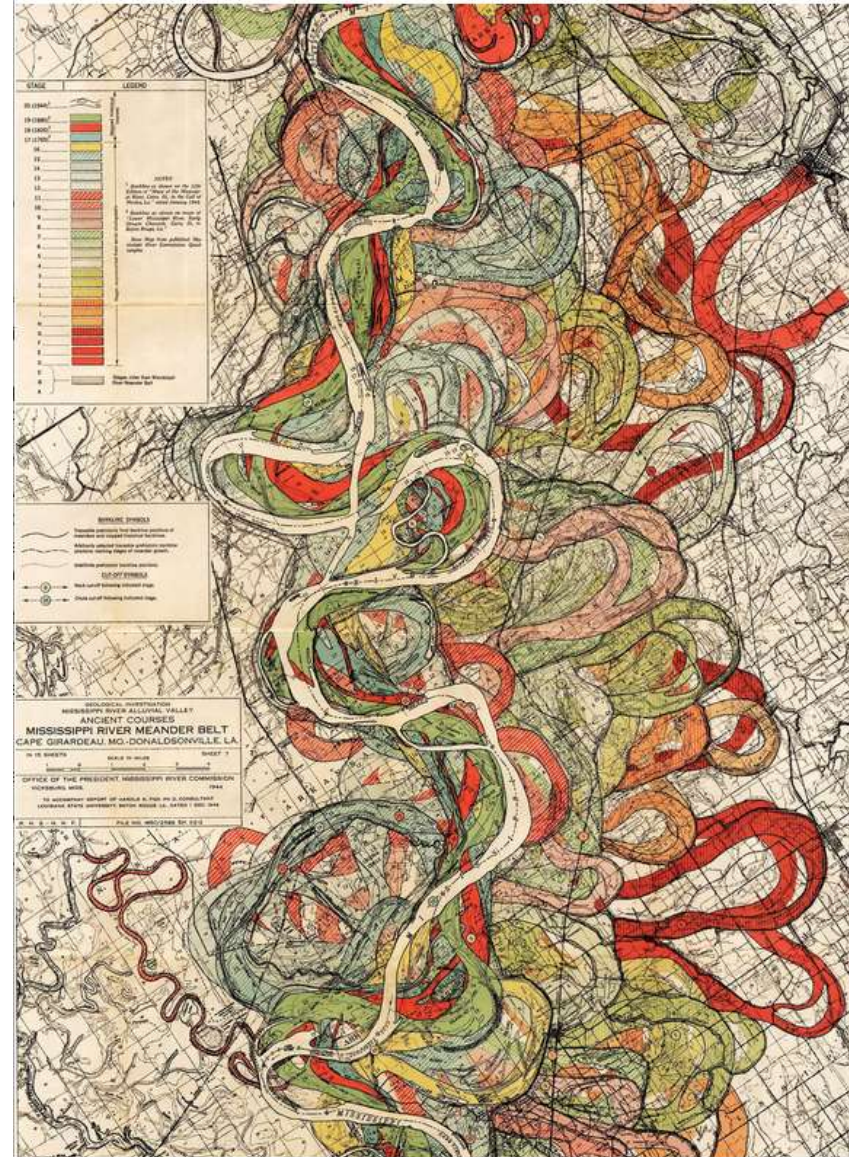
with Caroline Paske, State Hazard Mitigation Planner  
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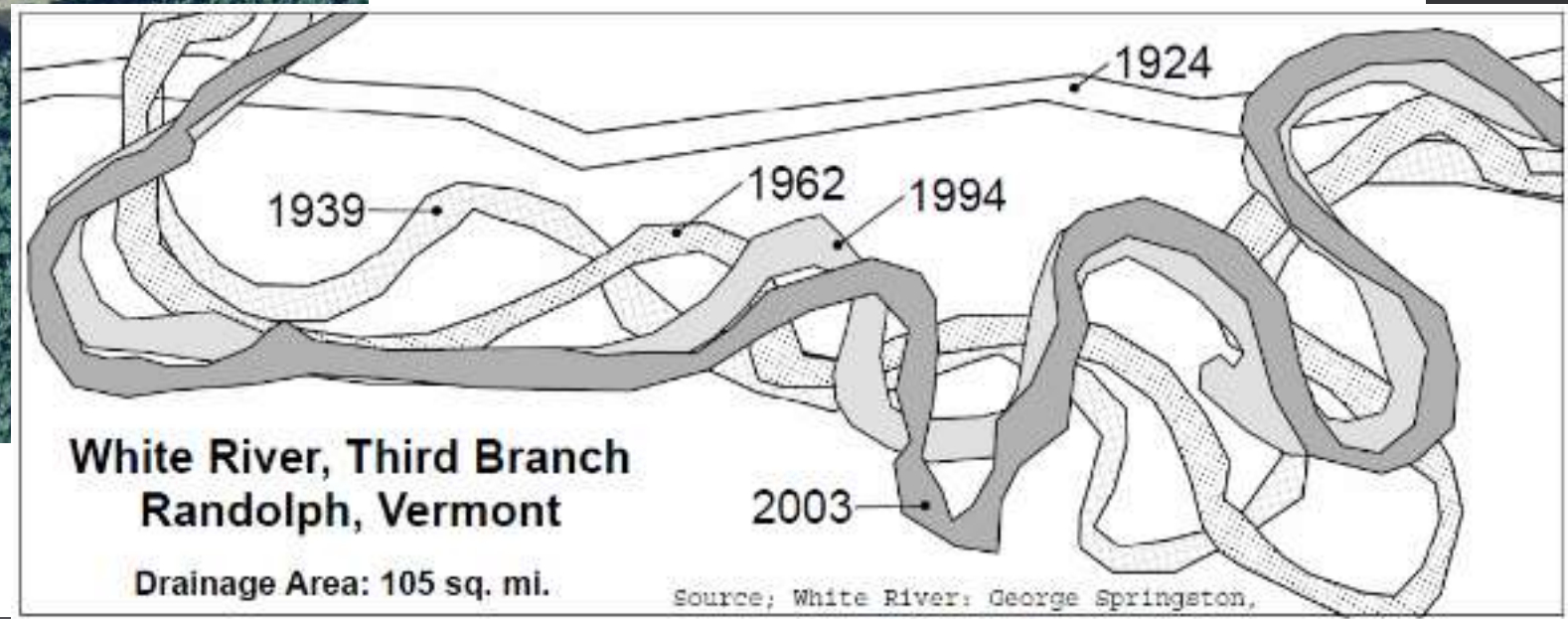
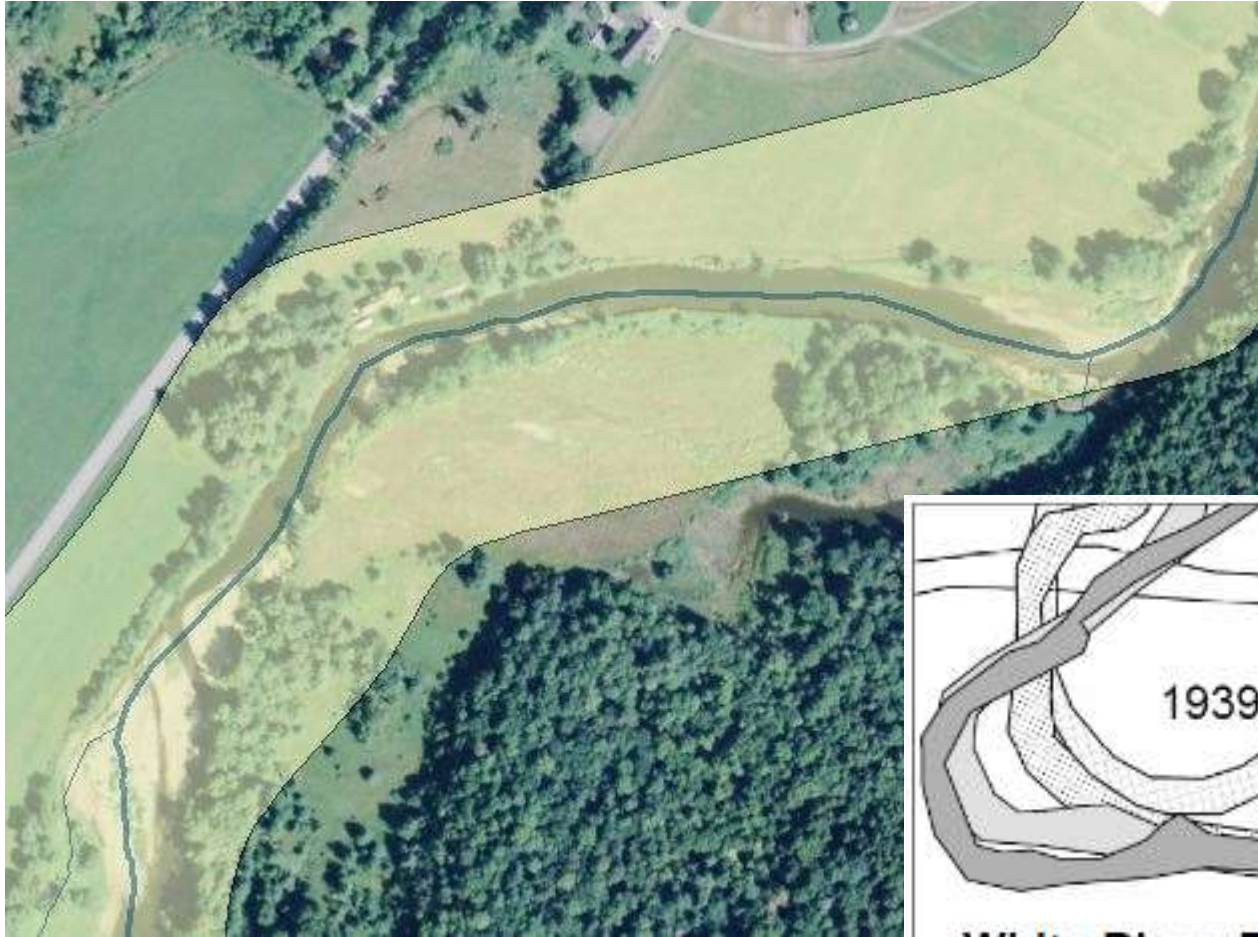




# River Corridors

- Image: Geologist Harold Fisk charted a 40-mile stretch of the Mississippi River from Friars Point to Gunnison, Mississippi. Fisk used aerial photos and maps to estimate the past and then-present channels.
- This is the idea behind river corridor protections in Vermont. We must give the river room not only to flood its banks and utilize the natural floodplain, but also to move depositing sediment and eroding it too.





# River corridors and hazard mitigation planning?

- River Corridor bylaws are an important planning tool in Vermont. Learn more: [https://floodready.vermont.gov/flood\\_protection/river\\_corridors\\_floodplains/river\\_corridors](https://floodready.vermont.gov/flood_protection/river_corridors_floodplains/river_corridors)
- Communities that adopt river corridor bylaws qualify for more funding after declared disasters to help with local match requirements.
- Hazard mitigation plans are a first step in Vermont's ERAF program for additional assistance from the state. Learn more: [https://floodready.vermont.gov/find\\_funding/emergency\\_relief\\_assistance](https://floodready.vermont.gov/find_funding/emergency_relief_assistance)
- River corridors protect natural hazard mitigation systems including floodplains and wetlands.
- Protecting natural systems is more cost effective than engineering nature-based ones!

# Conservation is Planning

- Communities need to account for and celebrate the natural assets they already have through planning and inventory processes.
- Priority areas must be protected to avoid development.
- Consider both properties along waterways and other hazard prone areas, and properties that support the whole system – think headwater storage and intact forest blocks.



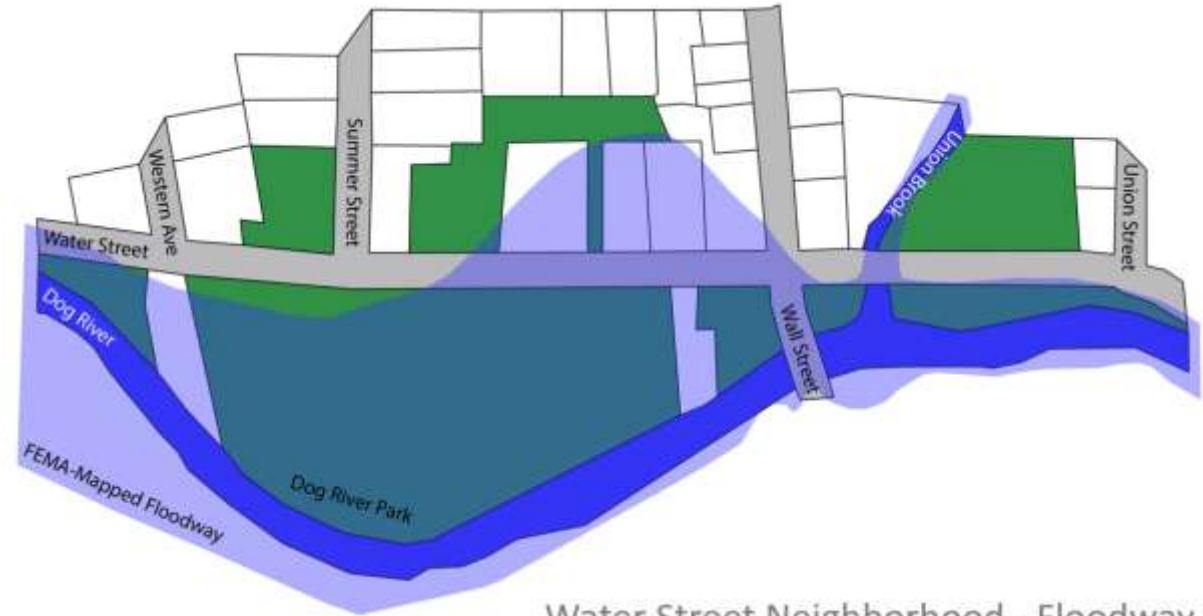
# Removing Existing Development

- FEMA provides funding for buyouts, however only properties in the SFHA are eligible.
  - To close the gap we created the FRCF.
- If you would like to know more about this program visit our website:  
<https://vem.vermont.gov/flood-resilient-communities-fund>

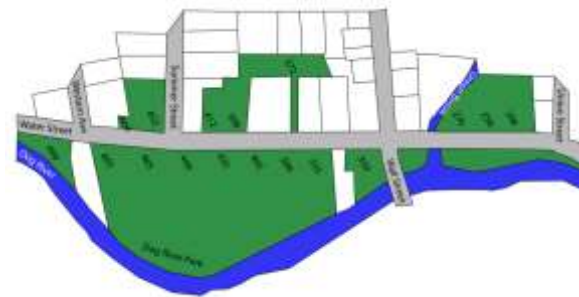




# Buyouts at Dog River Park, Northfield, VT



Water Street Neighborhood - Floodway



Property Buyouts and Floodplain Restoration



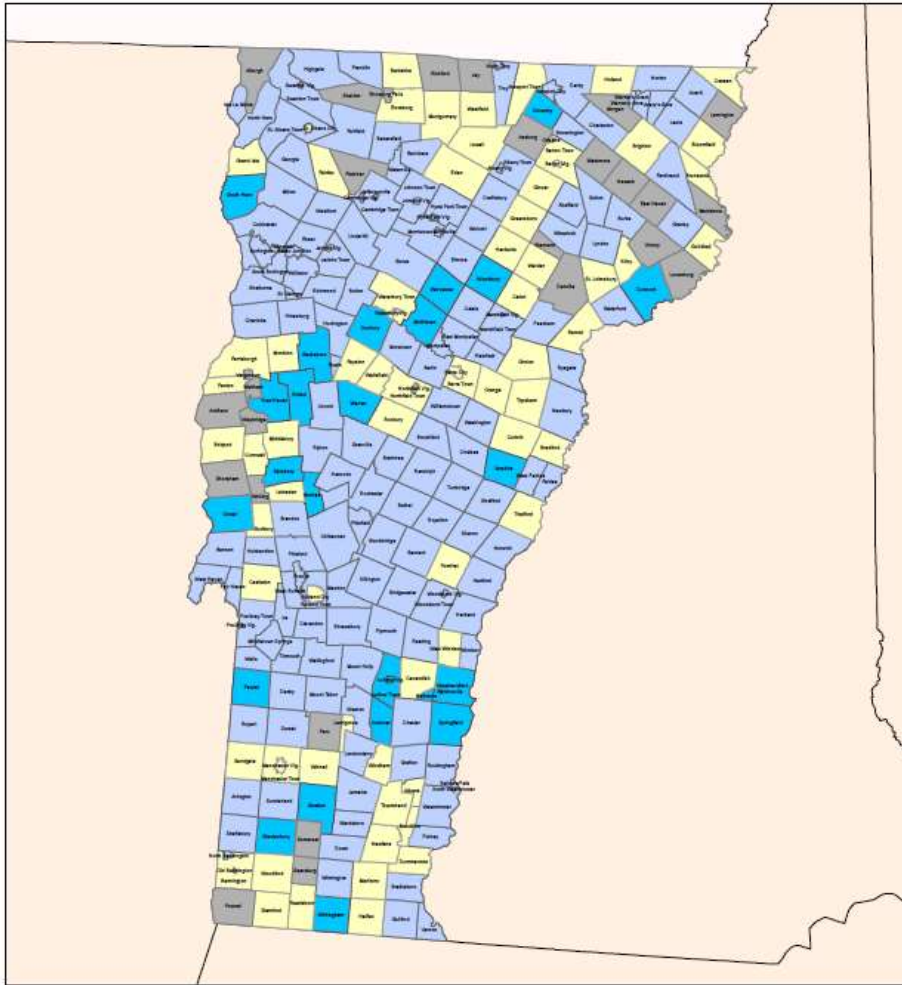
# FRCF Eligible Projects:

- Flood-vulnerable structure and buyout projects
- Vacant at-risk parcel buyout/conservation
- Natural resource projects to improve floodplain access/function
- Project scoping, planning, education and outreach initiatives

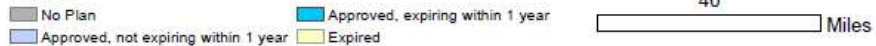


# Local Hazard Mitigation Plans (LHMP)

- Each state across the nation has a SHMP that is updated every 5 years, and each local government does as well.
- LHMPs are a huge lift for our small towns!
- Natural resource and wetland professionals can make a huge impact by getting involved.
- Think you have a good project idea? Get it in the local hazard mitigation plan to get it funded!



#### Legend



Data sources: FEMA Community Data Layer, US Census TIGER Polygons, Statistics Canada

# 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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# Planning Process

- Include natural resource professionals as part of the planning team
- Integrate natural resource planning documents and data sources
- Reach out to natural resource stakeholders for input



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# Risk Assessment

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



**Table 3: Hazard Assessment**

Hazard Impacts	Probability	Potential Impact					Score*:
		Built Environment	People	Economy	Natural Environment	<u>Average:</u>	
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

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# 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.



**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**

**Soil Health**

**Stormwater  
Retention**

**Water  
Quality**

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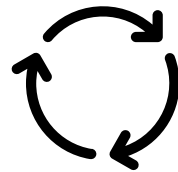
# Plan Maintenance and Update

## Maintenance

- Monitor
  - What progress have you made in implementing mitigation projects?
- Evaluate
  - Have you been able to implement projects?
  - What have barriers been?
  - What needs to change?

## Update

- Formally update the plan for FEMA-approval every five years
- One and half years is recommended for the time it takes to update a plan.
- Add about another year if you want FEMA funding through your state hazard mitigation office.



***It is not too late  
to get involved!***



# Thank you!

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