

Winooski River Basin  
***Draft*** Co-Benefits Assessment Methodology  
26 January 2023

# Co-Benefits Categories

- 1) Environmental Justice
- 2) Ecological Benefits
- 3) Ecosystem Services
- 4) Community Building
- 5) Education

# Environmental Justice

- ◆ An Environmental Justice Co-Benefit is realized when a project is situated in a Census Block Group where one or more demographic conditions exist to warrant the identification of that area as an Environmental Justice Focus Population.
- ◆ S.148 (Act 154) – signed by the Governor on 31 May 2022
- ◆ § 6002. DEFINITIONS
  - ◆ (3) “Environmental justice” means all individuals are afforded equitable access to and distribution of environmental benefits; equitable distribution of environmental burdens; and fair and equitable treatment and meaningful participation in decision-making processes, including the development, implementation, and enforcement of environmental laws, regulations, and policies. Environmental justice recognizes the particular needs of individuals of every race, color, income, class, ability status, gender identity, sexual orientation, national origin, ethnicity or ancestry, religious belief, or English language proficiency level. Environmental justice redresses structural and institutional racism, colonialism, and other systems of oppression that result in the marginalization, degradation, disinvestment, and neglect of Black, Indigenous, and Persons of Color. Environmental justice requires providing a proportional amount of resources for community revitalization, ecological restoration, resilience planning, and a just recovery to communities most affected by environmental burdens and natural disasters.



# Environmental Justice

- ◆ S.148 (Act 154) – signed by the Governor on 31 May 2022
- ◆ § 6002. DEFINITIONS
  - (4) “Environmental justice focus population” means any census block group in which:
    - (A) the annual median household income is not more than 80 percent of the State median household income;
    - (B) Persons of Color and Indigenous Peoples comprise at least six percent or more of the population; or
    - (C) at least one percent or more of households have limited English proficiency.
  - (5) “Limited English proficiency” means that a household does not have a member 14 years or older who speaks English “very well” as defined by the U.S. Census Bureau.
  - (6) “Meaningful participation” means that all individuals have the opportunity to participate in energy, climate change, and environmental decision making. Examples include needs assessments, planning, implementation, permitting, compliance and enforcement, and evaluation. Meaningful participation also integrates diverse knowledge systems, histories, traditions, languages, and cultures of Indigenous communities in decision-making processes. It requires that communities are enabled and administratively assisted to participate fully through education and training. Meaningful participation requires the State to operate in a transparent manner with regard to opportunities for community input and also encourages the development of environmental, energy, and climate change stewardship.

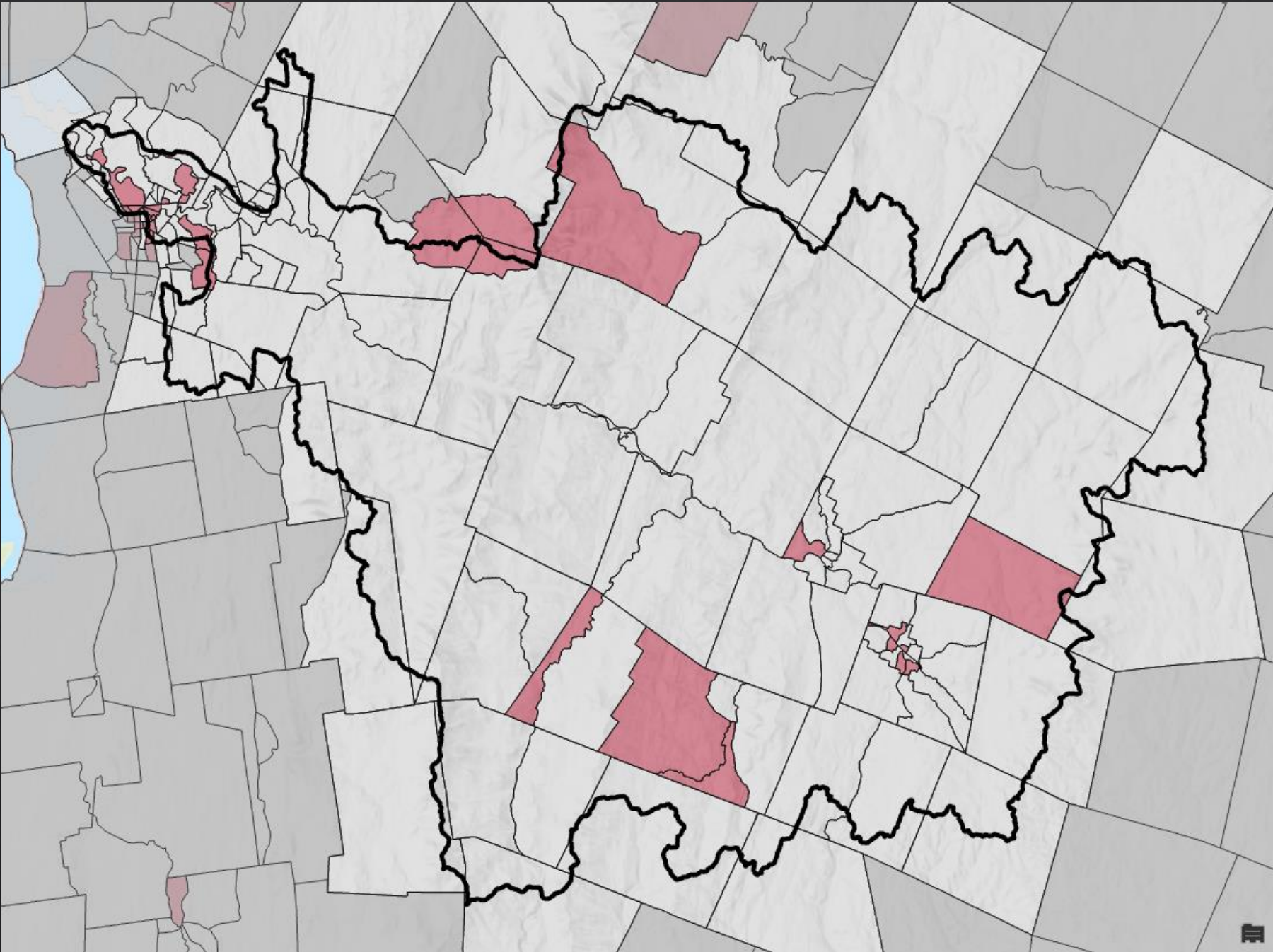


# Environmental Justice: Data Resources

- ◆ Vermont Center for Geographic Information
  - ◆ [Block Group Boundaries](#)
  - ◆ [Town Boundaries](#)
- ◆ US Census American Communities Survey (2021)
  - ◆ [Median Household Income \(B19103\)](#)
  - ◆ [Race \(B02001\)](#)
  - ◆ [Language \(C16002\)](#)

# EJ: Income

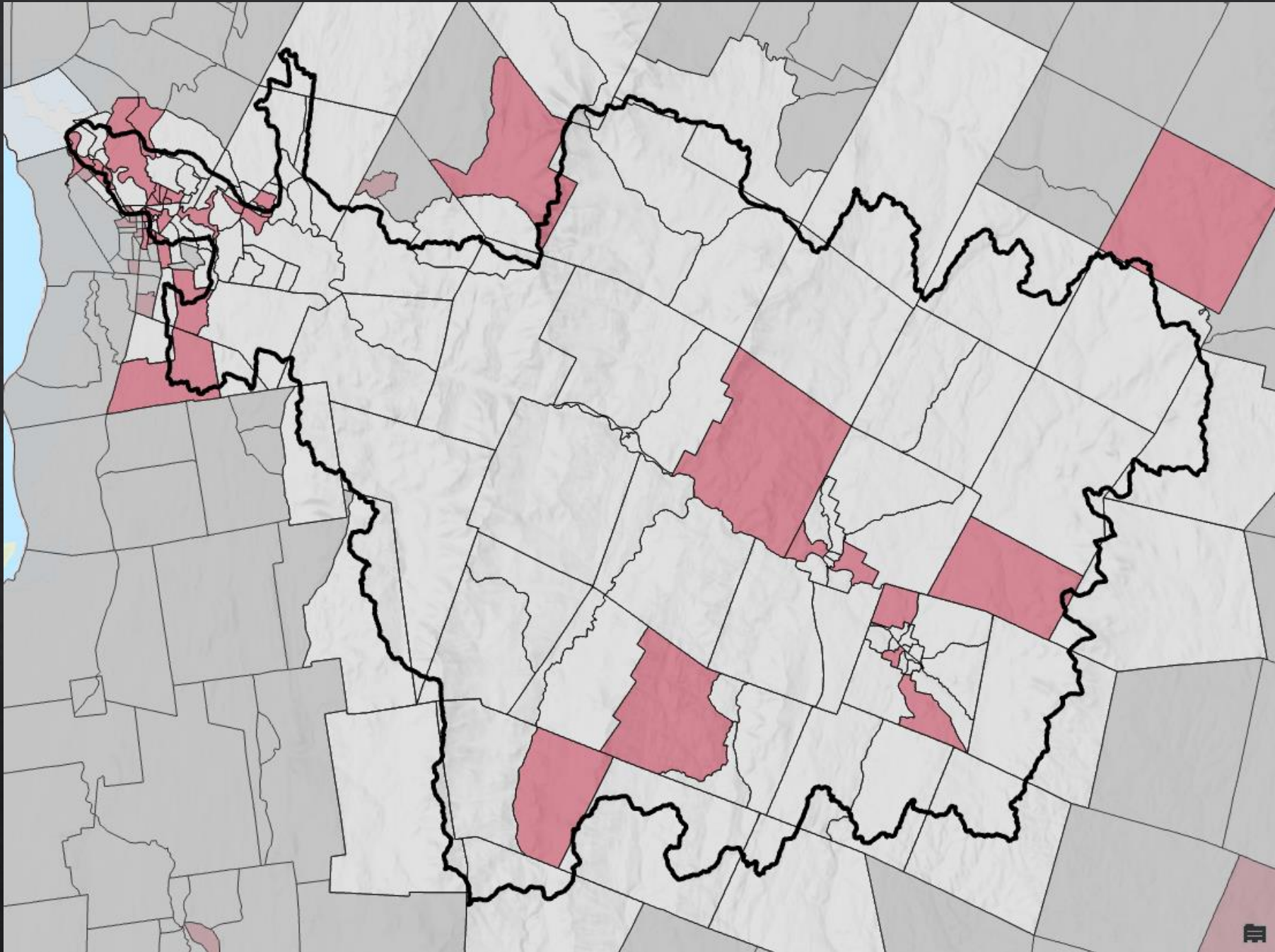
Municipality
Barre City
Bolton
Burlington
Colchester
Jericho
Montpelier
Northfield
Plainfield
S Burlington
Stowe
Underhill
Waitsfield
Winooski





# EJ: Language

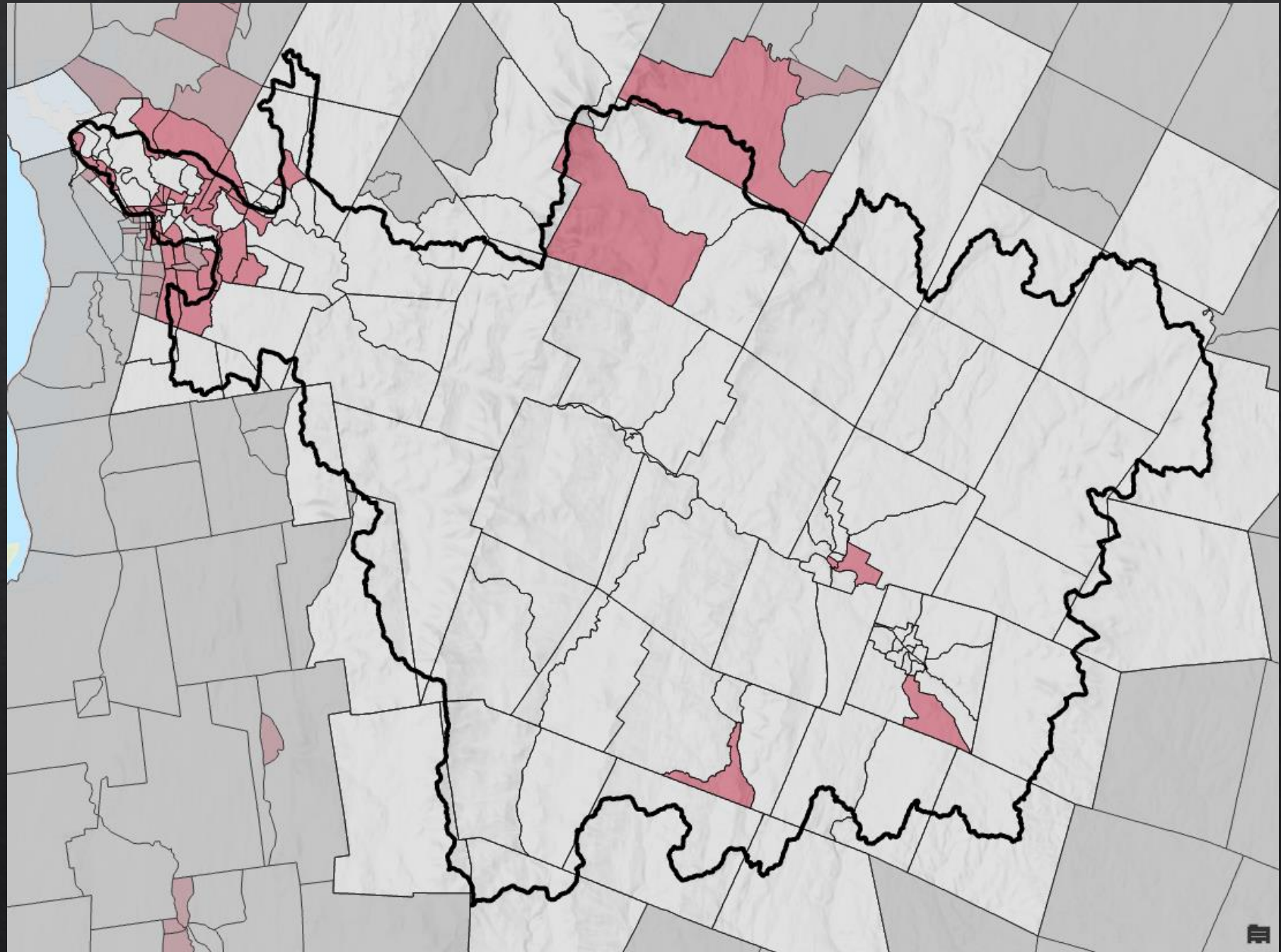
Municipality	
Barre City	Northfield
Barre Town	Plainfield
Burlington	Shelburne
Colchester	S Burlington
Essex	Underhill
Jericho	Walden
Middlesex	Warren
Montpelier	Winooski





# EJ: Race

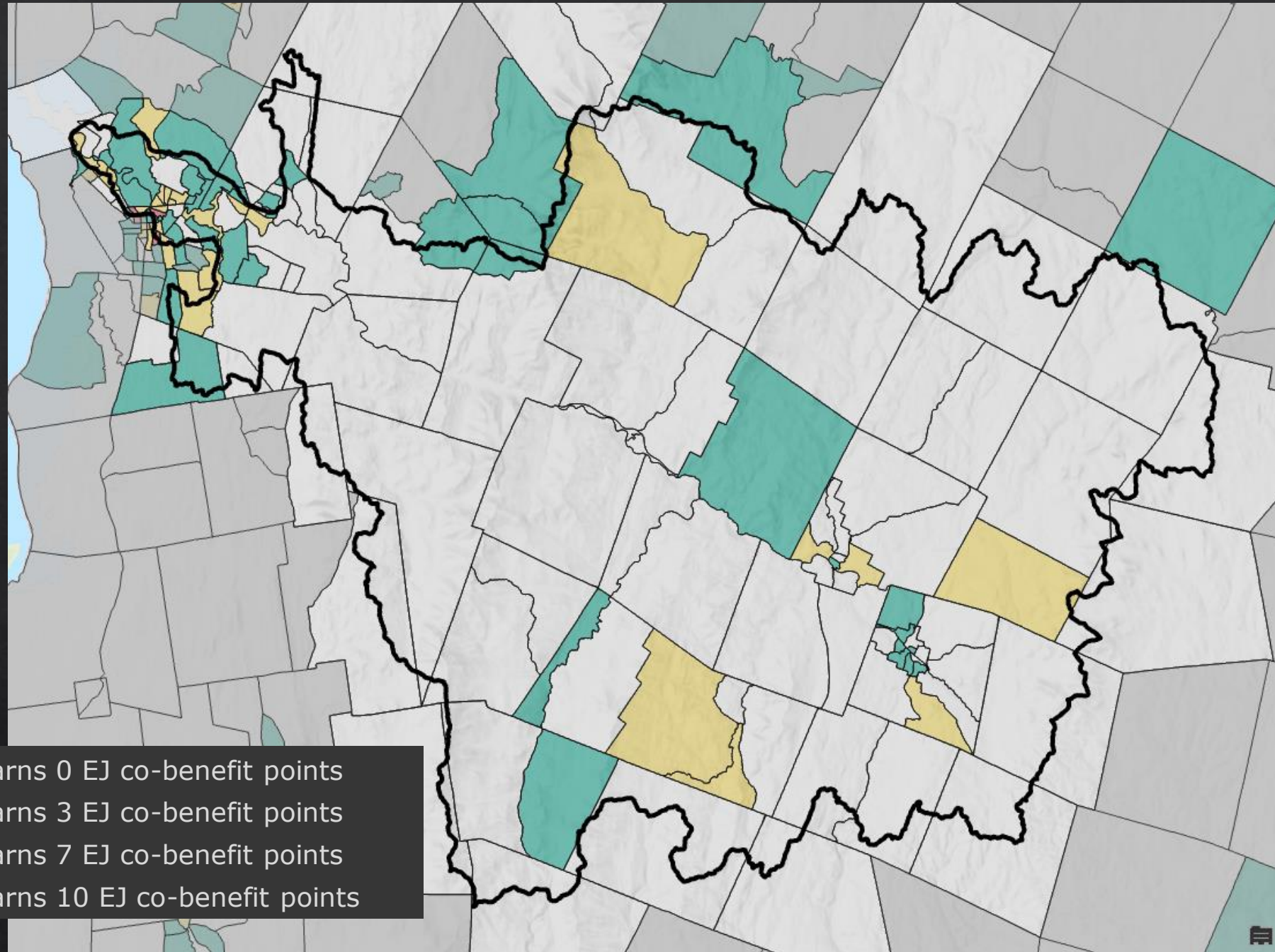
Municipality
Barre Town
Burlington
Colchester
Essex
Montpelier
Morristown
Northfield
S Burlington
Stowe
Williston
Winooski



# Environmental Justice: Scoring

10 points (max)

- ◇ Income – 3 points
- ◇ Race – 3 points
- ◇ Language – 3 points
- ◇ Projects in block groups that meet more than one target criteria – 1 point





# Ecological Benefits




- ◇ An Ecological Co-Benefit is realized when a project: 1) reduces a stressor; 2) protects priority water resources; or 3) enhances critical habitat.
- ◇ Reduction of stressors (3 points max)
  - ◇ A project located within a listed / impaired watershed or hydrologically connected to a 303(d) listed river, stream, lake or pond earns 3 points
  - ◇ Data resources
    - ◇ [303\(d\) listed rivers & streams](#)
    - ◇ [303\(d\) listed lakes & ponds](#)
    - ◇ [303\(d\) listed watershed](#)
    - ◇ [Stormwater impaired watershed](#)
- ◇ Protection of priority water resources (3 points max)
  - ◇ A project located within a region which is hydrologically connected to a priority river, stream, lake or pond earns 3 points
  - ◇ Data Resources
    - ◇ [Priority rivers & streams](#)
    - ◇ [Priority lakes & ponds](#)
- ◇ Enhancement of key habitat & species (4 points max)
  - ◇ A project located within a significant natural community earns 2 points
  - ◇ A project located in the vicinity of a rare, threatened or endangered species earns 2 points
  - ◇ Data Resources
    - ◇ [Significant natural communities](#)
    - ◇ [Rare, threatened & endangered species](#)

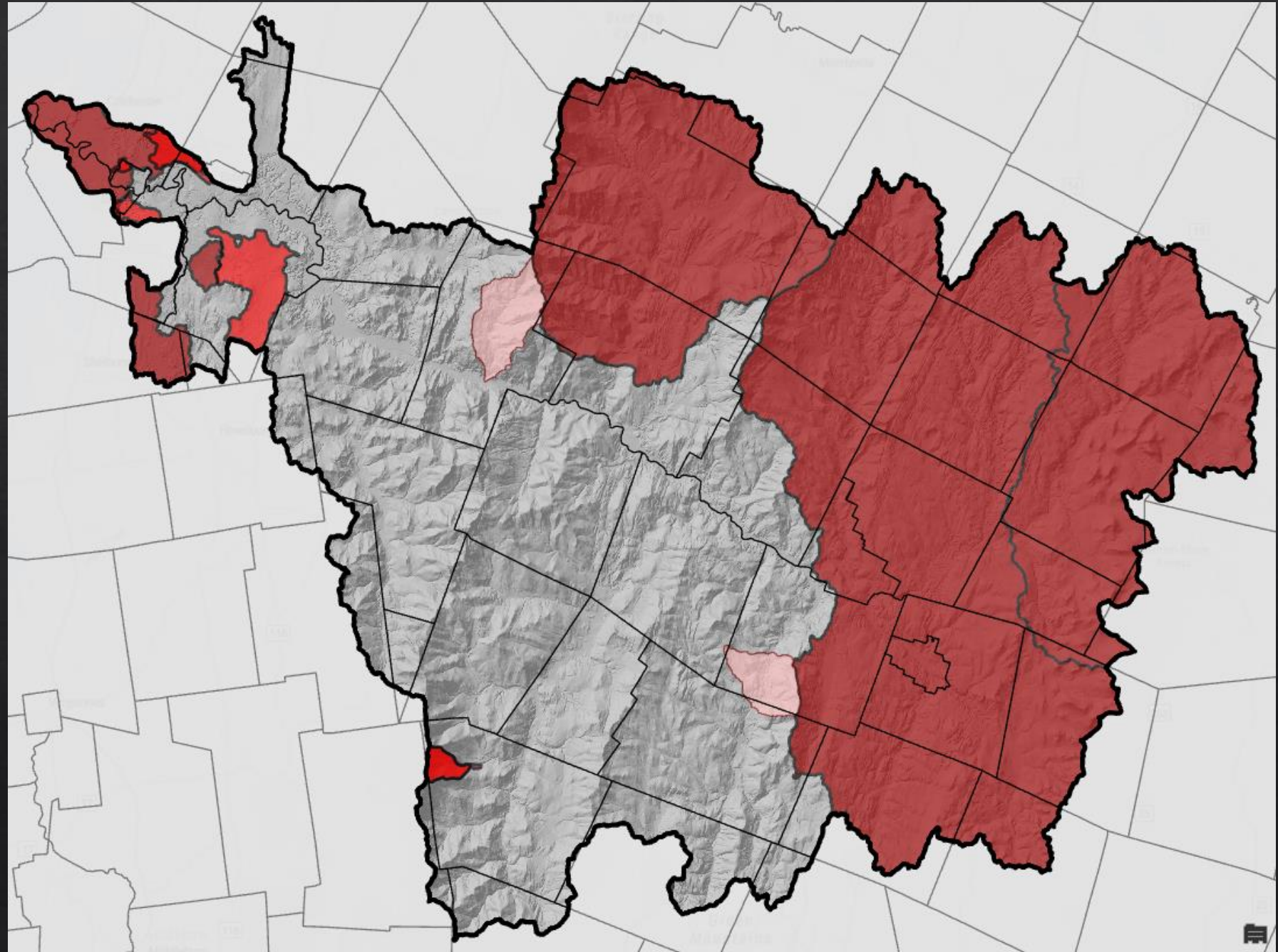


# Ecological Benefits

- ◆ An Ecological Co-Benefit is realized when a project: 1) reduces a stressor; 2) protects priority water resources; or 3) enhances key habitat.
- ◆ Reduction of stressor
  - ◆ Stressor: a phenomenon with quantifiable damaging effects on surface waters resulting from the delivery of pollutants to a waterbody, or an increased threat to public health and safety (Winooski TBP, 2018)
  - ◆ Stressed, Altered & Impaired Waters: waters that do not support uses and do not meet standards are included in the 303(d) List of Impaired Waters
    - ◆ [Vermont Water Quality Monitoring Program Strategy 2011 - 2020](#)
    - ◆ [2016 DEC Assessment & Listing Methodology](#)
- ◆ Protection of priority waters
  - ◆ Water supply, aquatic habitat, swimming, fishing & boating (see Winooski Tactical Basin Plan Chapter 4 (pages 121 – 130))
  - ◆ Outstanding Resource Waters – there aren't any currently in Basin 8 but the last TBP suggested two (Huntington River from gorge to confluence w/ Winooski & North Branch of the Winooski from the Worcester / Middlesex town line upstream to the headwaters)
- ◆ Enhancement of key habitat & species
  - ◆ The Vermont Fish and Wildlife Department's Natural Heritage Inventory records are most commonly created for current or historically known occurrences of natural communities or native species of conservation interest

# Stressors

- ▴ ☒ Stressed Sub-basins  

- ▴ ☒ Stormwater Impaired Watershed  

- ▴ ☒ 303(d) Listed Watershed  






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# Priority Waters

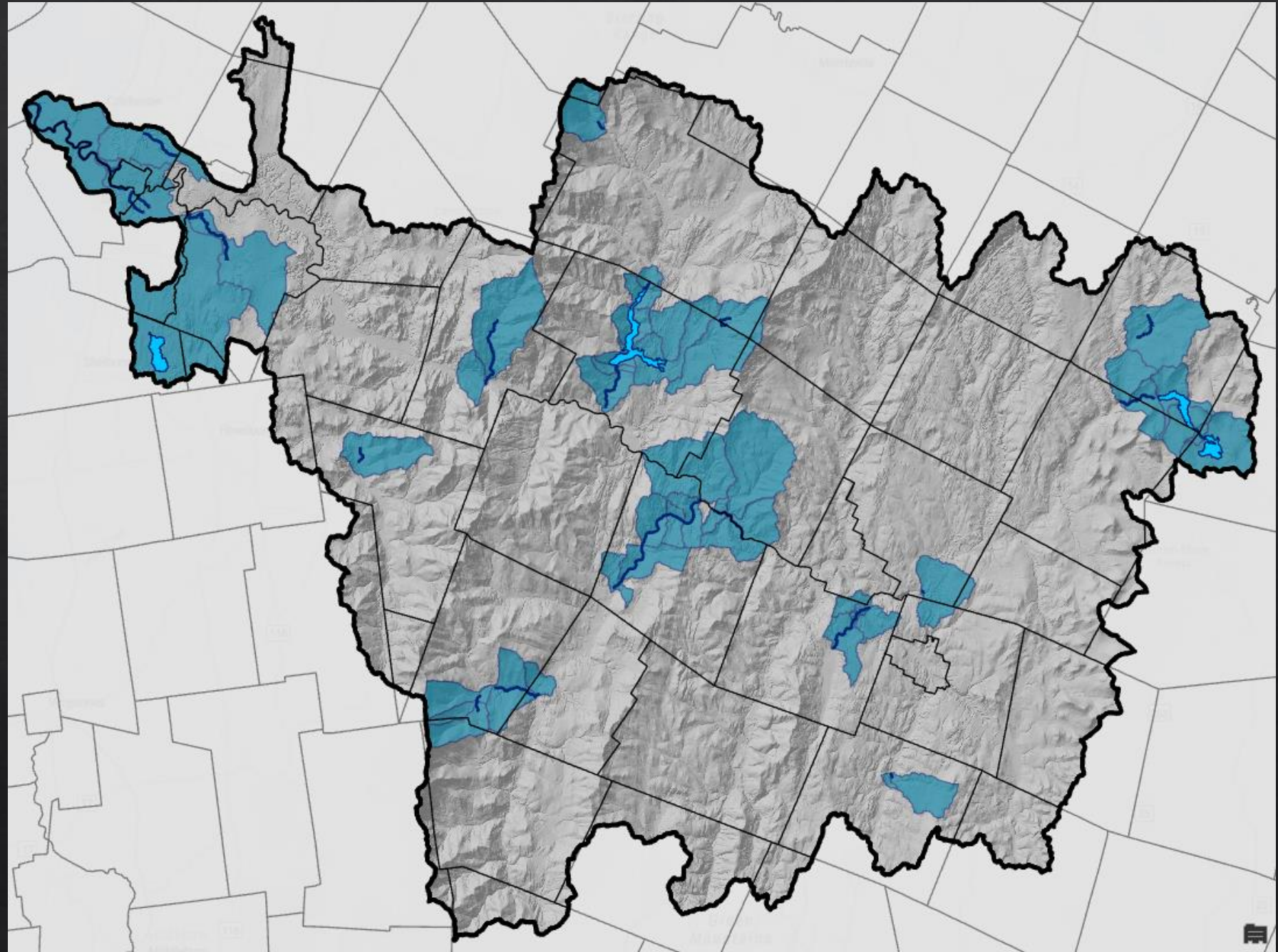
▴ ☒ Priority Rivers & Streams



▴ ☒ Priority Lakes & Ponds



▴ ☒ Priority Sub-basins



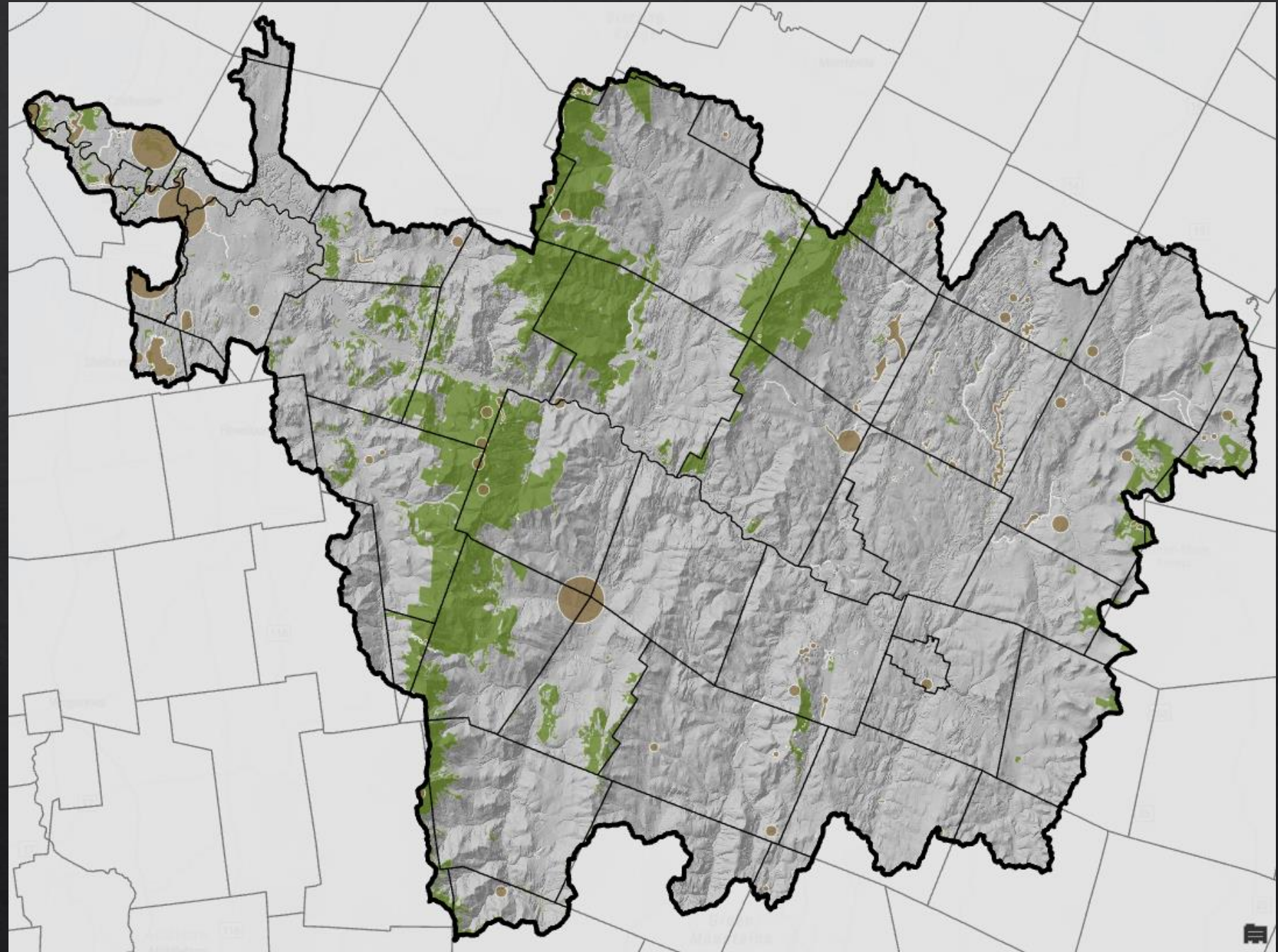
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# Rare, Threatened & Endangered Species + Significant Natural Communities

- ▲ ☒ Rare, Threatened & Endangered Species  
■
- ▲ ☒ Significant Natural Communities  
■





# Ecologically Significant Target Areas

▲ ☒ Stressed Sub-basins



▲ ☒ Stormwater Impaired Watershed



▲ ☒ 303(d) Listed Watershed



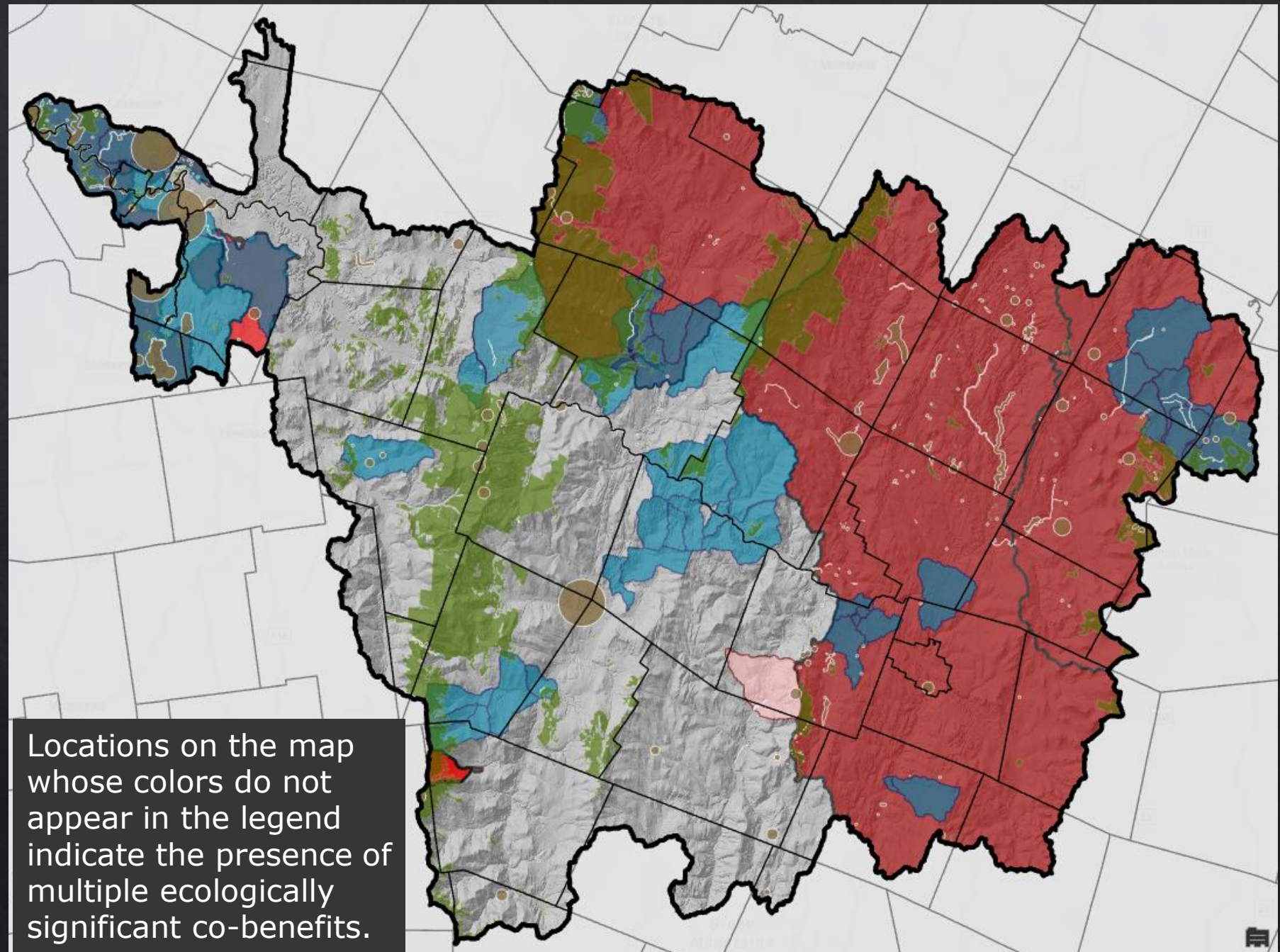
▲ ☒ Priority Sub-basins



▲ ☒ Rare, Threatened & Endangered Species



▲ ☒ Significant Natural Communities



# Ecosystem Services: Categories

- ◇ Provisioning Services: any type of benefit to people that can be extracted from nature
  - ◇ Food
  - ◇ Fiber
  - ◇ Natural Medicines
- ◇ **Regulating Services: the benefit provided by ecosystem processes that moderate natural phenomena**
  - ◇ Carbon Sequestration: the process of capturing and storing atmospheric carbon dioxide with the goal of reducing global climate change
  - ◇ Flood Resilience: minimizing damage during flooding to reduce the risk to people and infrastructure and ensure there is ample room for flooding and river adjustment to occur where the opportunity may exist
  - ◇ Air Quality
- ◇ Cultural Services: non-material benefit that contributes to the development and cultural advancement of people
  - ◇ Ethical Values
  - ◇ Existence Values
  - ◇ Recreation & Tourism
- ◇ Supporting Services: the processes which allow the Earth to sustain basic life forms
  - ◇ Nutrient & Water Cycling
  - ◇ Soil Formation
  - ◇ Photosynthesis



# Community Building

- ◆ A Community Building Co-Benefit is realized when a project involves the community in data collection and decision-making, enhances the working landscape and provides recreational benefits.
- ◆ Community (4 points max):
  - ◆ Are there proposed efforts to meaningfully involve community members in planning, **project development**, decision-making **and implementation**? (2 points)
  - ◆ Does the project involve data collection by community members (e.g. citizen science initiative)? (2 points)
- ◆ Working Landscape (3 points max):
  - ◆ Is the project located on a parcel that is enrolled in the Use Value & Appraisal Program (aka the Current Use Program)?
- ◆ Recreation (4 points max):
  - ◆ Does the project maintain / improve an existing recreational space? (2 points)
  - ◆ Will the project result in new / expanded recreational opportunities? (2 points)



# Education

- ◊ An Education Co-Benefit is realized when a project includes aspects of public outreach designed to educate community members about the importance of phosphorus reduction and watershed health
- ◊ Scoring (10 points max)
  - ◊ No educational component: 0 points
  - ◊ Interpretive signage: 5 points
  - ◊ Educational meetings / workshops: 5 points

# Co-Benefit Scoring Examples: Scenario

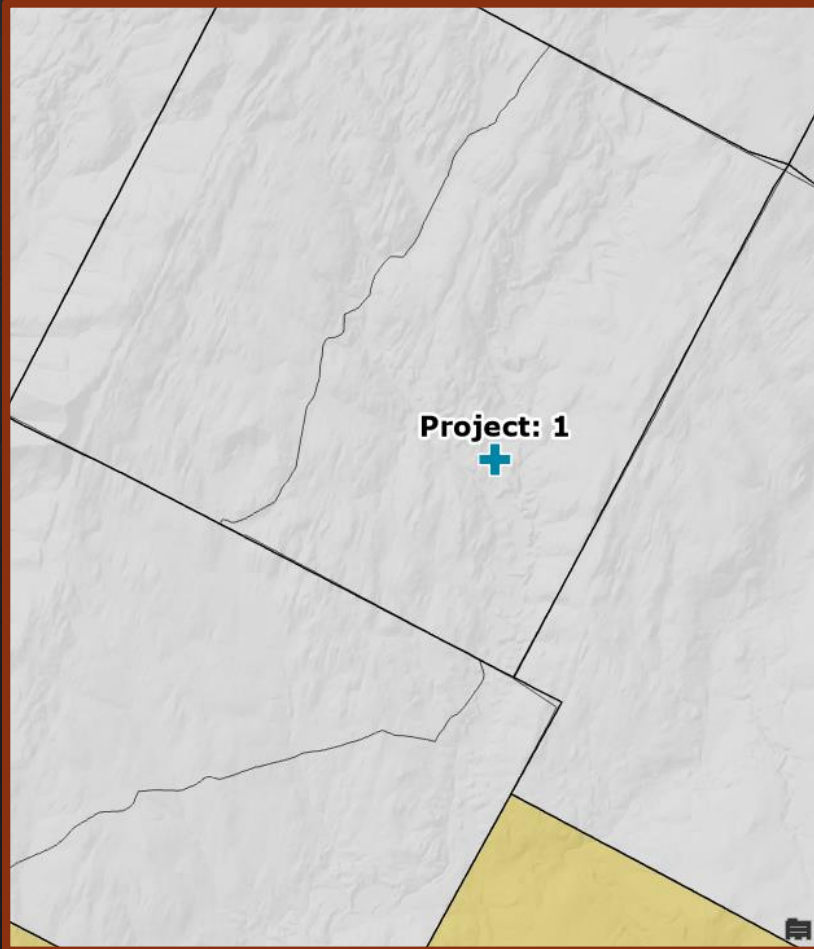
- ◆ Project 1
  - ◆ Riparian buffer planting
- ◆ Project 2
  - ◆ Sand filter & gravel wetland





# Co-Benefit Scoring Examples: Environmental Justice

## Project 1



## Project Scoring

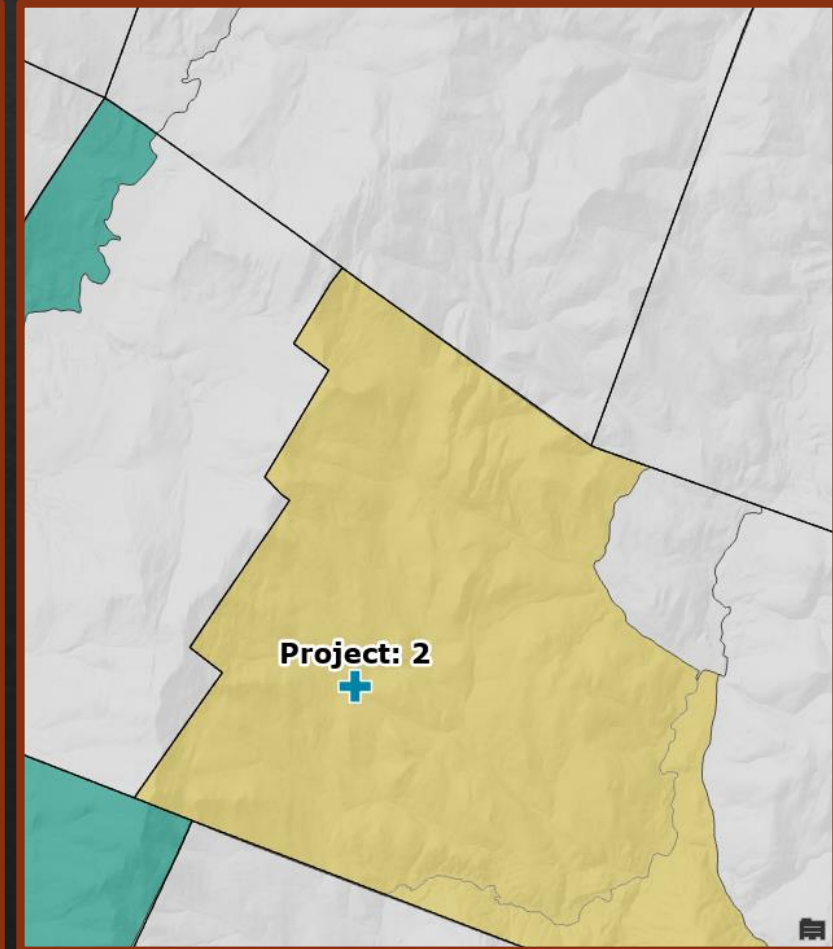
### Environmental Justice Indicators



Project 1: is situated in a block group with 0 Environmental Justice Indicators, earning 0 points.

Project 2: is situated in a block group with 2 Environmental Justice Indicators, earning  $3 + 3 + 1 = 7$  points

## Project 2



# Co-Benefit Scoring Examples: Ecological Benefit

## Project 1



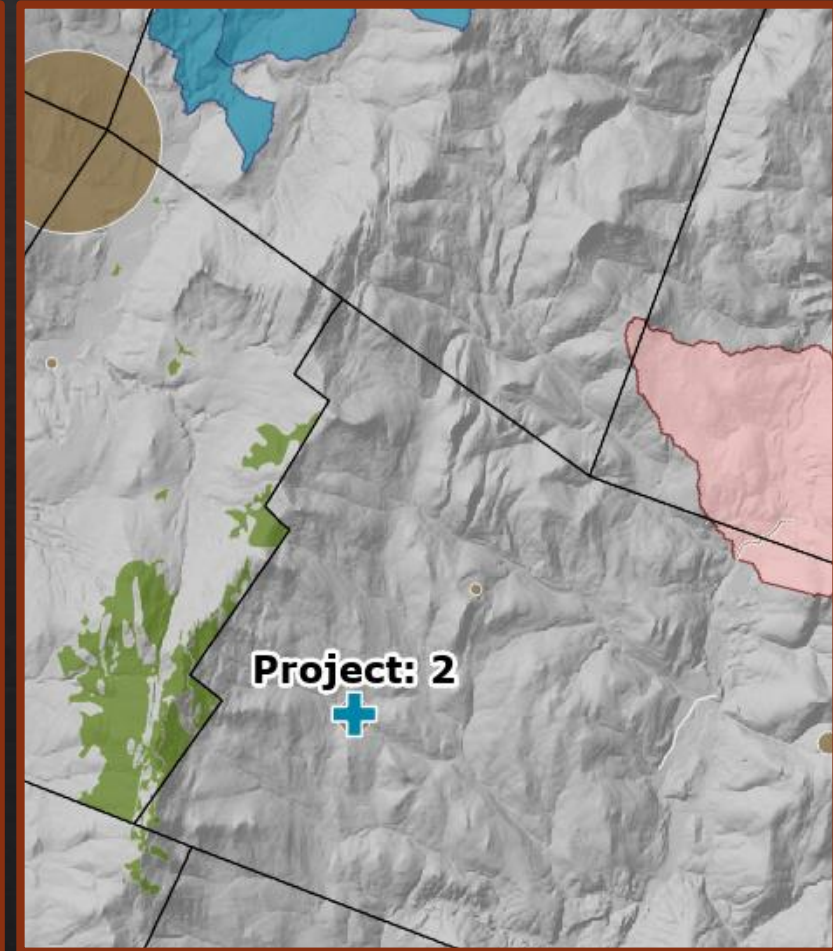
## Project Scoring

Project 1 is located: 1) on a site with Rare, Threatened or Endangered species (2 points); 2) on a significant natural community (2 points); 3) in a 303d listed watershed (3 points)

Score:  $2 + 2 + 3 = 7$

Project 2 is located: 1) on a site with Rare, Threatened or Endangered species (2 points)  
Score: 2

## Project 2





# Co-Benefit Scoring Examples: Ecosystem Services

## Project 1

Description: the riparian buffer planting is expected to provide carbon sequestration & flood regulation benefits.

Score: 10 points

## Project 2

Description: due to the design capacity of the sand filter and gravel wetland complex, the project is expected to provide flood regulation benefits.

Score: 5 points

# Co-Benefit Scoring Examples: Community Building

## Project 1

Description: the riparian buffer came about following extensive community conversation, including participation by local educators (2 points); the Conservation Commission is assisting with project implementation and will monitor the site (2 points); the project is located on parkland and is expected to improve the existing recreational space (2 points)

Score:  $2 + 2 + 2 = 6$

## Project 2

Description: the sand filter and gravel wetland project was identified via the stormwater master planning process which featured extensive involvement by the Selectboard, the Conservation Commission and local residents (2 points); the project is located on a parcel that is enrolled in the Current Use Program (3 points)

Score:  $2 + 3 = 5$



# Co-Benefit Scoring Examples: Education

## Project 1

Description: the project is located on parkland adjacent to the local elementary school and the science teacher has developed instructional material related to the project, including visits to the project to understand the range of benefits provided (5 points); interpretive signs describing the importance of native vegetation and the impact of invasive species will be posted at the project site (5 points)

Score:  $5 + 5 = 10$

## Project 2

Description: an interpretive sign will be posted at the project site to explain the project goals, why it is needed & the expected benefits (5 points)

Score: 5

# Co-Benefit Scoring Examples: Computing the Co-Benefit Score

Project 1

Project 2

Co-Benefit	CWSP Score	BWQC Weight	Project Score
Environmental Justice	0	33%	0
Ecological Benefits	7	30%	2.1
Ecosystem Services	10	15%	1.5
Community Building	6	17%	1.02
Education	10	5%	0.5
Total Score			5.12

Co-Benefit	CWSP Score	BWQC Weight	Project Score
Environmental Justice	7	33%	2.31
Ecological Benefits	2	30%	0.6
Ecosystem Services	5	15%	0.75
Community Building	5	17%	0.85
Education	5	5%	0.25
Total Score			4.76



# To Do List

- ◆ Review draft co-benefits methodology & provide feedback (DEADLINE: 6 February 2023)
  - ◆ Any feedback appreciated, but solutions to potential issues / shortcomings are especially welcome
  - ◆ Ecological Benefits – this is the co-benefit whose definition has changed the most – are we there yet?
  - ◆ Ecosystem Services – list the types of projects that are likely to yield carbon sequestration or flood regulation benefits (separate lists for each service type)
- ◆ Consider how you would weight the co-benefits
  - ◆ Once the list of co-benefits is complete (including definitions), they need to be assigned weights (NOTE: The CWSP will distribute a worksheet to facilitate this.)
  - ◆ You have 100 points to distribute among the 5 co-benefits
  - ◆ The more points you assign to a co-benefit, the greater the importance of that co-benefit (relative to other co-benefits)
  - ◆ Each BWQC member submits their scoring preference
  - ◆ The average of all scores for a single co-benefit (e.g. Environmental Justice) will be used as the BWQC weight (for that co-benefit)