

<b>To:</b>	Tom Barrasso and John Lopez	<b>Date:</b>	January 22, 2019
<b>From:</b>	BSC Group	<b>Proj. No.</b>	89492.46
<b>Re:</b>	January 22, 2018 MVP Natural Resources Infrastructure Assessment Meeting Summary		

**Meeting Attendees:** Tom Barrasso (Director of Energy & Environmental Affairs), John Lopez (Conservation Agent), Peter Manor (DPW), Cory Riley (Amesbury resident/NHF&G), Nipun Jain ((Planning Director), Gillian Davies (BSC Group), Dominic Rinaldi (BSC Group)

**Purpose**

- 1. To briefly review existing natural resources and ecological climate resiliency mapping of the City of Amesbury;
- 2. To review nature-based solutions to climate change;
- 3. To discuss and develop specific ideas for nature-based solutions that will support community and ecological climate resiliency in the town of Amesbury.
- 4. Conduct site walk of Woodsom Farm and Amesbury downtown area to review NBS opportunities. Due to the need for more discussion time and challenging weather (extreme cold and snow), the site walk was not conducted during this meeting.

After briefly reviewing natural resource and resiliency mapping and the concept of nature-based solutions, the bulk of the meeting was focused on evaluating specific ideas for nature-based solutions that could realistically be implemented with either little to no outside funding or would have a good chance of winning grant funding through the MVP Action grant, CZM grant or other grant fund programs. A summary of the meeting discussion is provided below. **Bold** identifies potential actions/solutions that could be pursued.

**Mapping**

- 1. It was suggested that maps showing soils and hydrology be added to the maps.
- 2. MVPC has mapping showing town-owned land and land under conservation restrictions. Seek to obtain these maps from MVPC.
- 3. Develop maps showing major evacuation routes (Rts 495, 95, 110) and where flooding already occurs (Birch Meadow Rd, Newton Rd, Pleasant Valley Rd)

**Proposed Nature-Based Solutions**

- 1. **Pleasant Valley Road Study and NBS Project(s)**
  - a. Hydrologic study and project to replace undersized culverts to meet stream crossing standards
  - b. Coastal storm surge study to assess medium to long term outlook for embankment, road and property viability over the coming decades, development of NBS-based responses
  - c. Address Merrimack River embankment erosion with living shorelines solutions
- 2. **Amesbury Downtown and Commercial Areas Green Infrastructure**
  - a. Replace undersized catch basins, install raingarden tree wells, etc.
  - b. Install stormwater sidewalks (divide width into raingarden and reduced walking area)
  - c. Offer incentives for businesses to implement green roofs & walls
  - d. Assess both areas for flooding and stormwater management, to inform Green Infrastructure design.
- 3. **Zoning Updates and Handbook**
  - a. Change street cross-sections, set performance standards or review requirements for street redevelopment projects as well as new projects, so that street cross-sections include raingardens between sidewalks and roadways, reduce the roadway widths, separate pedestrians & bikes from vehicles, thereby addressing public safety while also increasing infiltration & cooling, snow & ice storage, and reducing flooding.
  - b. Add climate resiliency overlays
    - i. Woodsom Farm zoning overlay

- c. Add Green Infrastructure overlay for downtown area
- d. Develop new zoning requirements for parking lots (X% raingarden and pervious pavement)
- e. Update and complete earlier effort to prepare a Zoning Handbook with performance standards
- f. Update and implement Stormwater Bylaw
  - i. Estimated that it would take about 3 hours to update and complete the draft Stormwater Bylaw
- 4. **Golden Triangle** – last large undeveloped property near Rt 495
  - a. Provides flood storage for Rt 495 as well as surrounding neighborhood
  - b. Conduct hydrologic study that facilitates culvert replacement so that culverts meet stream crossing standards. Undersized culverts are located under Rt 110 and under Elm Street.
- 5. **Bartlett Farm**
  - a. Good flood storage
- 6. **Cider Hill Farm**
  - a. In 61A, zoned R80, they want to add a 2-acre greenhouse
- 7. **Woodsom Farm**
  - a. Located in water supply area (flood zone is the water supply area)
  - b. Conduct study to evaluate for flooding, cooling and water supply services, develop zoning overlay based on these services. City government and residents are not aware of important resiliency services provided by this land. It wasn't purchased for conservation, it was purchased to eliminate odors from piggery that used to be housed there.
- 8. **Assess flood storage and climate resiliency capacity of town-owned or conservation-restricted lands**
  - a. Use MVPC maps

**MVP Ideas**

- 1. Conduct Evacuation Route study
  - a. Utilize maps showing major evacuation routes (Rts 495, 95, 110) and where flooding already occurs (Birch Meadow Rd, Newton Rd, Pleasant Valley Rd)
- 2. MVP Report
  - a. Should include an appendix identifying specific properties and their resiliency strengths and vulnerabilities
- 3. Conduct emergency response study for Pleasant Valley Road area
- 4. Hold evening listening session for general public prior to Amesbury CRB meeting
- 5. Establish long-term body within Amesbury government to address climate challenges and implement resiliency planning & projects
  - a. Address immediate and long-term responses
- 6. Host workshop for City Council so they can better understand climate challenges and importance of resiliency planning
- 7. Address water quality and water quantity issues in MVP process
  - a. Sewage overflows
  - b. Protection of water supply in Woodsom Farm flood zone area
- 8. Aging infrastructure is an issue
- 9. Point out to people that Hazard Mitigation Planning is retroactive, whereas MVP Planning is proactive for future conditions

**Next Steps**

- a. Schedule evening Listening Session before CRB Workshop
- b. Reschedule site visit to Woodsom Farms and downtown area
- c. Amesbury provides documents to BSC
- d. Amesbury compiles contact information for invitees to the CRB meeting and sends invitation out with Community Characterization Survey Questions
- e. Plan for CRB Workshop



# MEMORANDUM

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<b>To:</b>	Tom Barrasso and John Lopez	<b>Date:</b>	February 12, 2019
<b>From:</b>	BSC Group	<b>Proj. No.</b>	89492.46
<b>Re:</b>	February 12, 2018 MVP Natural Resources Infrastructure Assessment Meeting & Site Walk Summary		

**Meeting Attendees:** Tom Barrasso (Director of Energy & Environmental Affairs), John Lopez (Conservation Agent), Robert Desmarais (DPW), Gillian Davies (Sr. Wetland Scientist, BSC Group), Dominic Rinaldi (Engineer, BSC Group), Casey-Lee Bastien (Landscape Architect, BSC Group)

### Purpose

1. To briefly review existing Amesbury natural resources and ecological climate resiliency mapping and the previously-discussed ideas for nature-based solutions at specific locations in Amesbury.
2. Conduct site walk of several Amesbury locations to review NBS opportunities in the field.

After briefly reviewing natural resource and resiliency mapping and previously discussed ideas for nature-based solutions, the group spent the bulk of the meeting visiting several locations that had been discussed as having potential for NBS projects. A summary of the meeting discussion is provided below.

**24 South Hampton Road**

A culvert passes from school property under South Hampton Road and discharges into a ditch with invasive species.

- Culvert replacement study could support replacement of the culvert with a new culvert that meets Massachusetts stream crossing standards.
- The stream and wetlands upgradient and downgradient from the culvert could be restored and invasive species removed.

### Pleasant Valley Road Study and NBS Project(s)

- Hydrologic study and project to replace undersized culverts to meet stream crossing standards.
- Coastal storm surge study to assess medium to long term outlook for embankment, road and property viability over the coming decades, development of NBS-based responses.
- Address Merrimack River embankment erosion with living shorelines solutions.
- Discuss ecological restoration of abandoned road (in Merrimac) with Merrimac.

## Amesbury Downtown, Upper Millyard and Commercial Areas Green Infrastructure

- Assess for opportunities to restore and stabilize Powwow River embankments, including removal of asbestos-lined pipe that runs over and along the Powwow River.
- Assess opportunities to reduce impervious cover and increase tree canopy at parking lot adjacent to Upper Millyard.
- Replace undersized catch basins, install raingarden tree wells, etc.
- Install stormwater sidewalks (divide width into raingarden and reduced walking area).
- Offer incentives for businesses to implement green roofs & walls.
- Work with NGRID to address hazards associated with substation adjacent to Powwow River.
- Assess for flooding and stormwater management, to inform Green Infrastructure design.

### Back River and Clark's Pond

- Plan and design a streambank & wetland restoration project (including invasive species removal) on town-owned land adjacent to Back River.
- Hydrologic study and project to replace undersized culverts to meet stream crossing standards.
- Develop community process and possible plan for Clark's Pond dam removal and river restoration project.

**Golden Triangle** – last large undeveloped property near Rt 495

Provides flood storage for Rt 495 as well as surrounding neighborhood.

- Conduct hydrologic study that facilitates culvert replacement so that culverts meet stream crossing standards. Undersized culverts are located under Rt 110 and under Elm Street.
- Develop plans for streambank and ecological restoration: invasive species removal, potential increase in flood storage capacity, stabilize streambanks.

**Woodsom Farm**

Located in water supply area (flood zone is the water supply area)

- Conduct study to evaluate for flooding, cooling and water supply services.
- Develop zoning overlay based on these services. City government and residents may not be fully aware of important resiliency services provided by this land, and how critical this area is for protecting the downtown area from flooding. It wasn't purchased for conservation, it was purchased to eliminate odors from piggery that used to be housed there.

**Next Steps**

- a. BSC updates maps based on discussions at this meeting
- b. BSC prepares NBS materials for CRB Workshop
- c. BSC prepares Natural Resources Infrastructure Assessment Report
- d. BSC provides Report, including mapping, to Amesbury



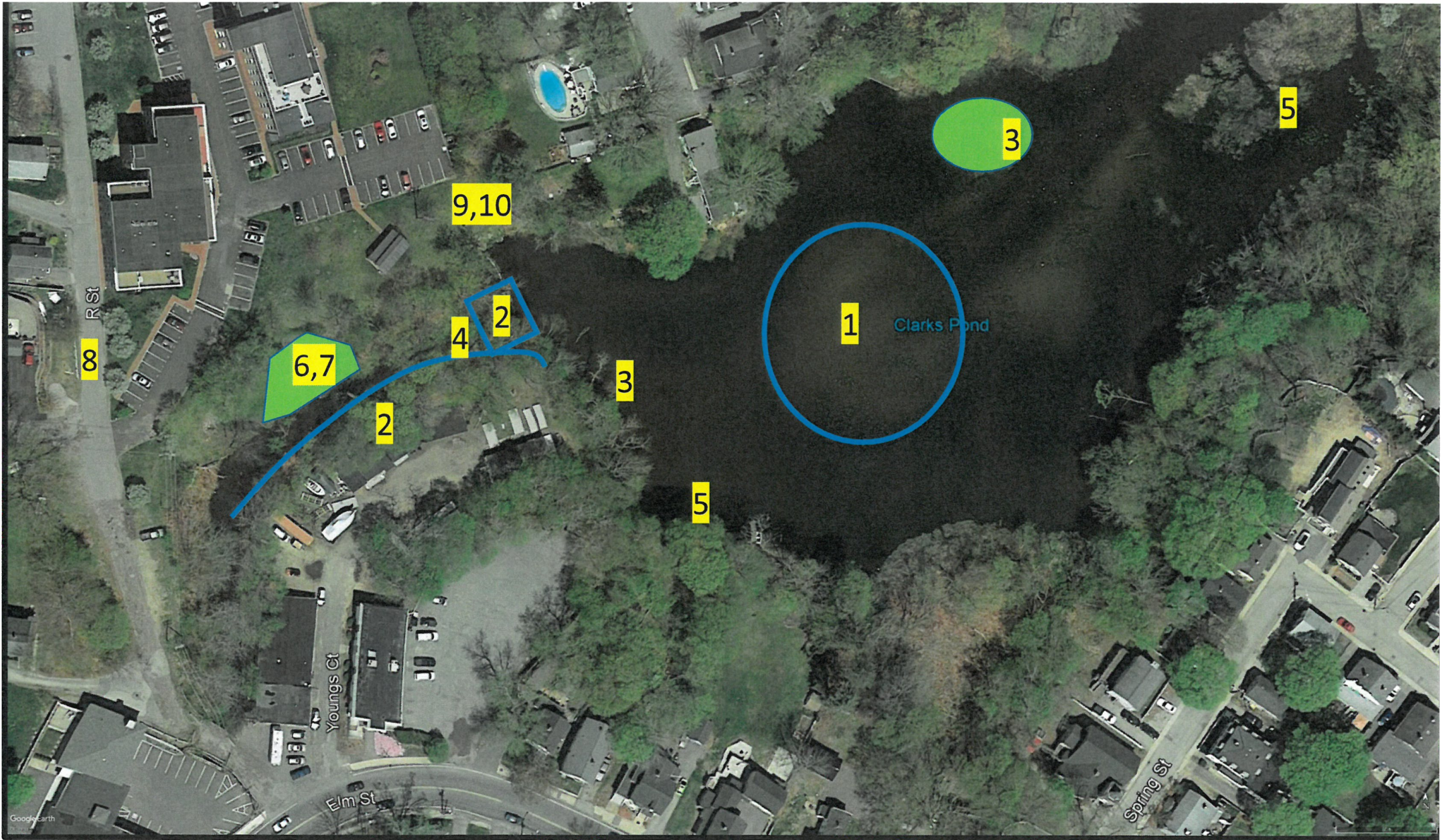
**APPENDIX C:**  
**ECOLOGICAL RESTORATION**  
**AND RESILIENCY**  
**OPPORTUNITIES MAPS, TABLE**  
**AND MEMORANDA**







1. Pond alteration (Dredge) #9
2. River bank revegetation #2
3. Island/ Floating island #18
4. Fish ladder #15
5. Wetland management restoration #5
6. Habitat enhancements #6
7. Stormwater treatment incorporation #11
8. Upstream BMP's #12
9. Educational interpretation #20
10. Accessible Canoe launch #24



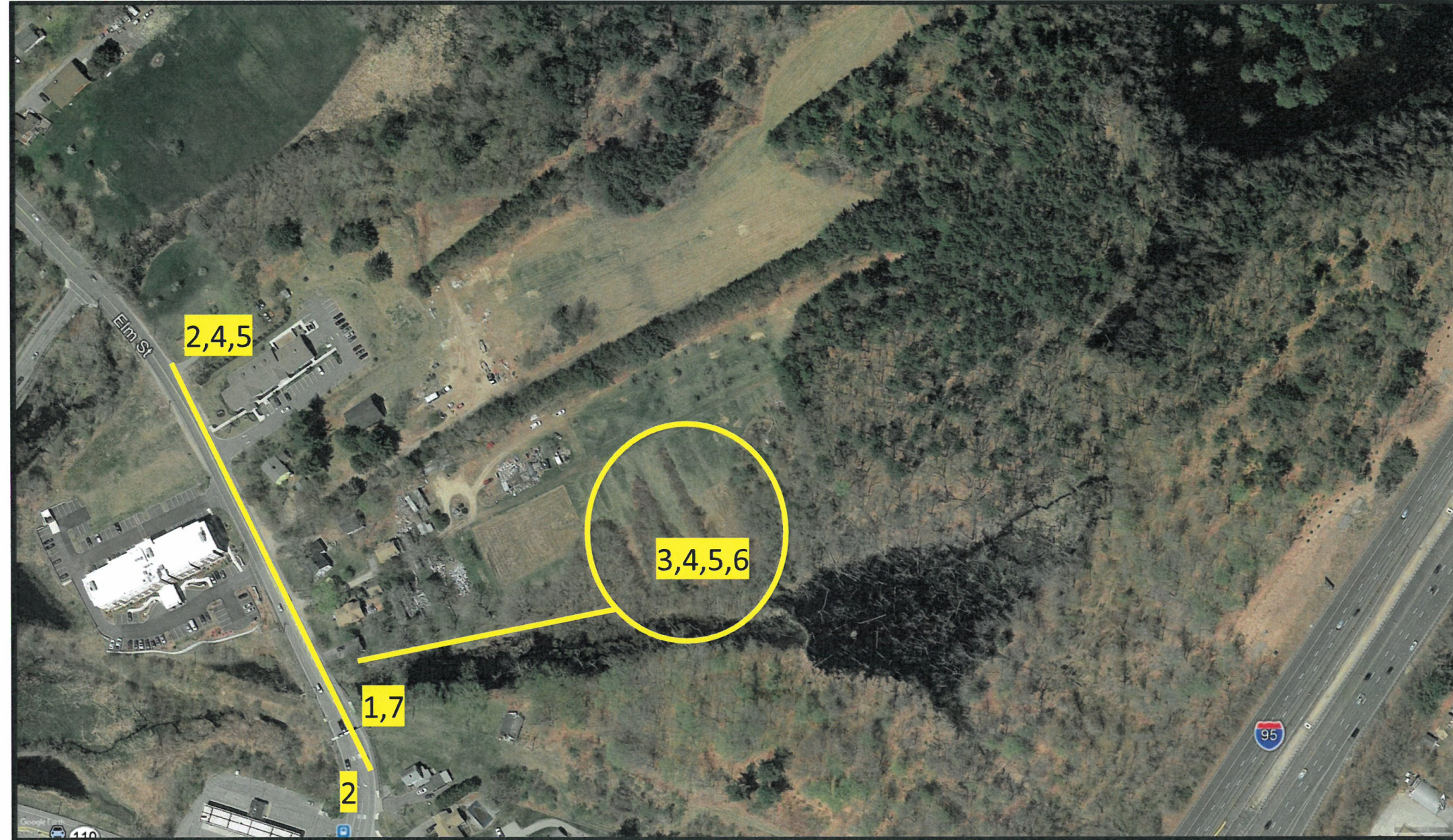
**A: Clark's Pond**

- Related Partnerships and or Regulatory Actions





1. MSCS culvert improvement #14
2. Upstream BMP's #12
3. River Flow Alteration #10
4. Wetland construction #7
5. Floodplain modification #8
6. Invasive species management #1
7. Street tree planting #13



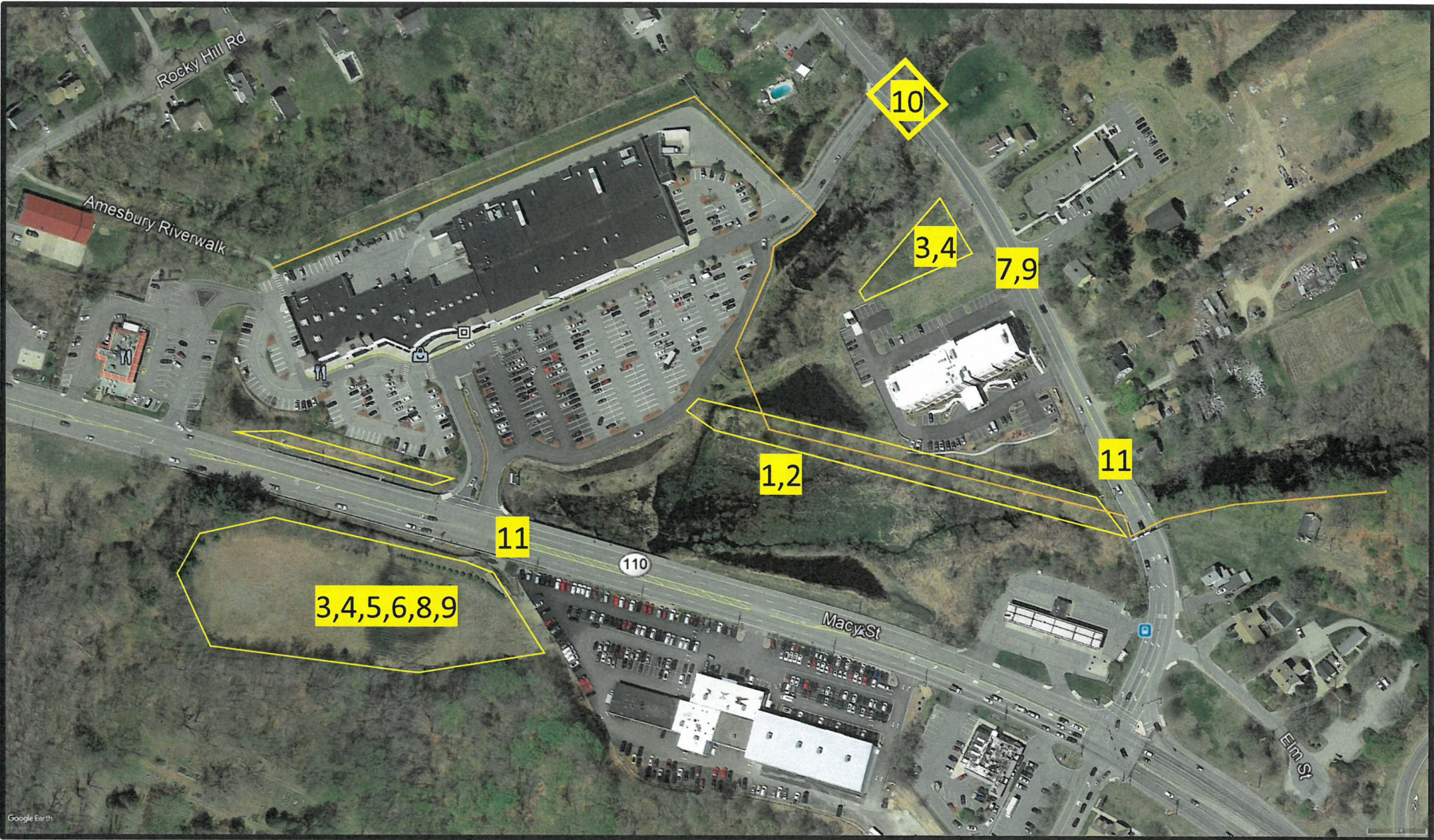
**B: Elm Street**

- Related Partnerships and or Regulatory Actions





1. Pedestrian bridge/ boardwalk #25,#26
2. Paved trail #23
3. Floodplan expansion/ constructed wetland #7,#8
4. Habitat enhancements #6
5. River flow Alteration
6. Grassland meadow management #3
7. Street tree planting #13
8. Pond creation #9
9. Upstream BMPs
10. MSCS culvert replacement #14



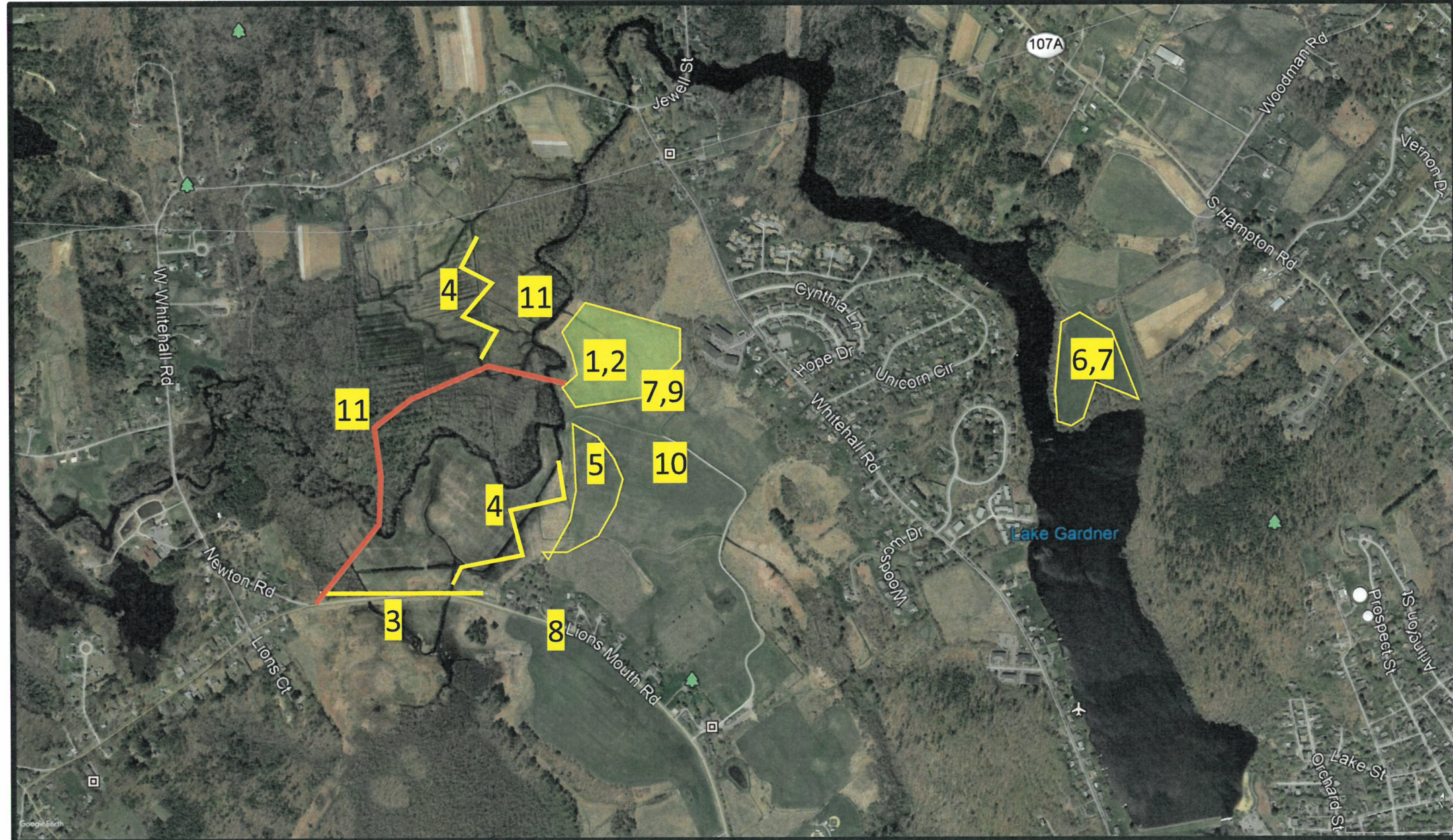
**C: Golden Triangle**

- Related Partnerships and or Regulatory Actions





1. Invasive species management #1
2. Grassland management #3
3. MSCS culvert replacement #14
4. Stream flow alteration, meandering #10
5. Heath establishment #4
6. Wetland construction #7
7. Floodplain modification/ ponding #8
8. Upstream BMPs, street tree planting #12
9. Habitat enhancements #6
10. Educational interpretation #20
11. Soft trails/ boardwalks #22, #25



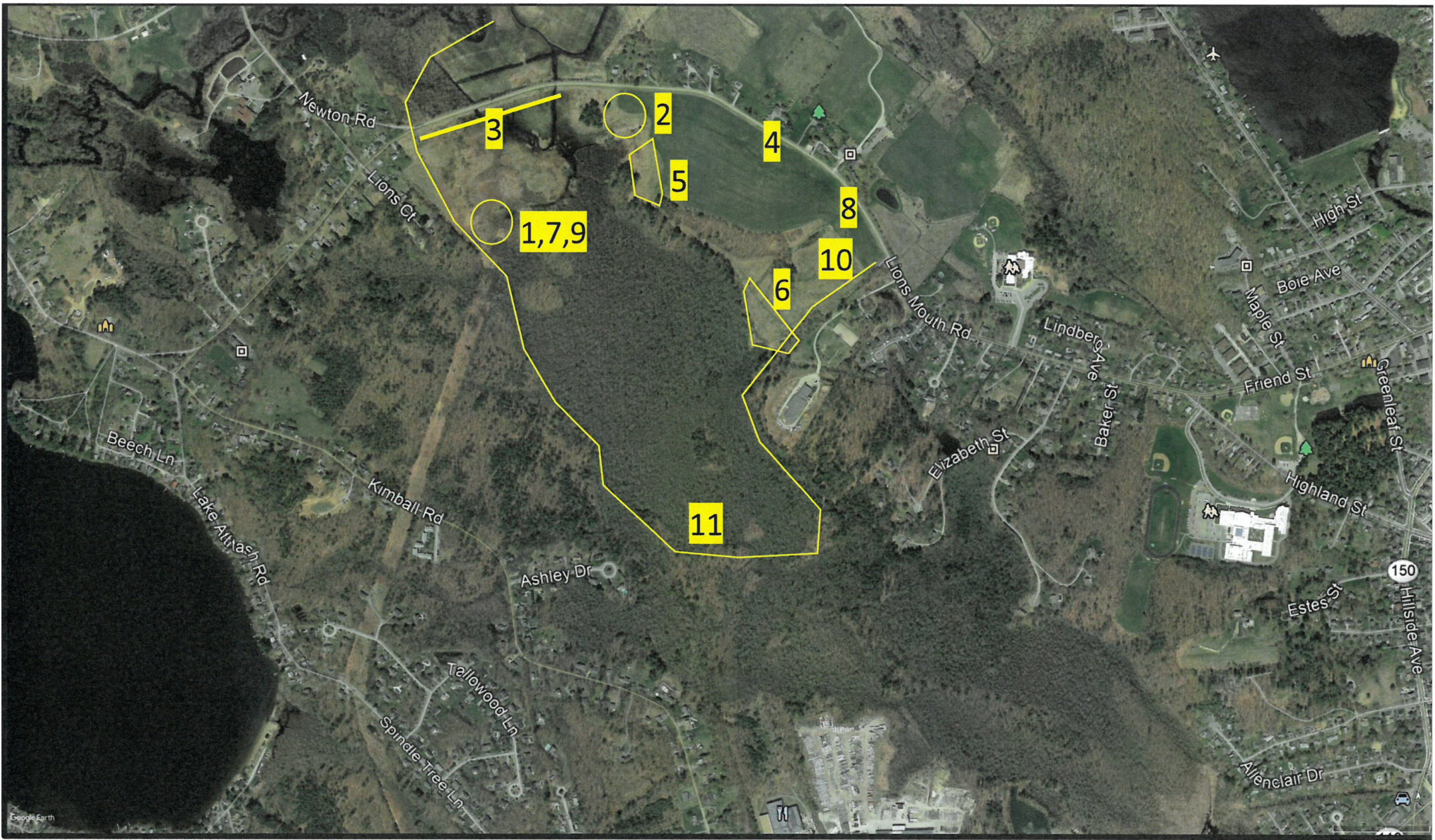
## D: Woodsom Farm North/Lion's Mouth Road/Lake Gardner

- Related Partnerships and or Regulatory Actions





1. Invasive species management #1
2. Grassland management #3
3. MSCS culvert replacement #14
4. Upstream BMP's #12
5. Shrubland Heath establishment #4
6. New Wetland construction #7
7. Floodplain expansion (ponding) #8
8. Street tree planting #13
9. Habitat enhancements #6
10. Educational interpretation #20
11. Soft trails/ boardwalks #22



### E: Woodsom Farm South & Great Swamp

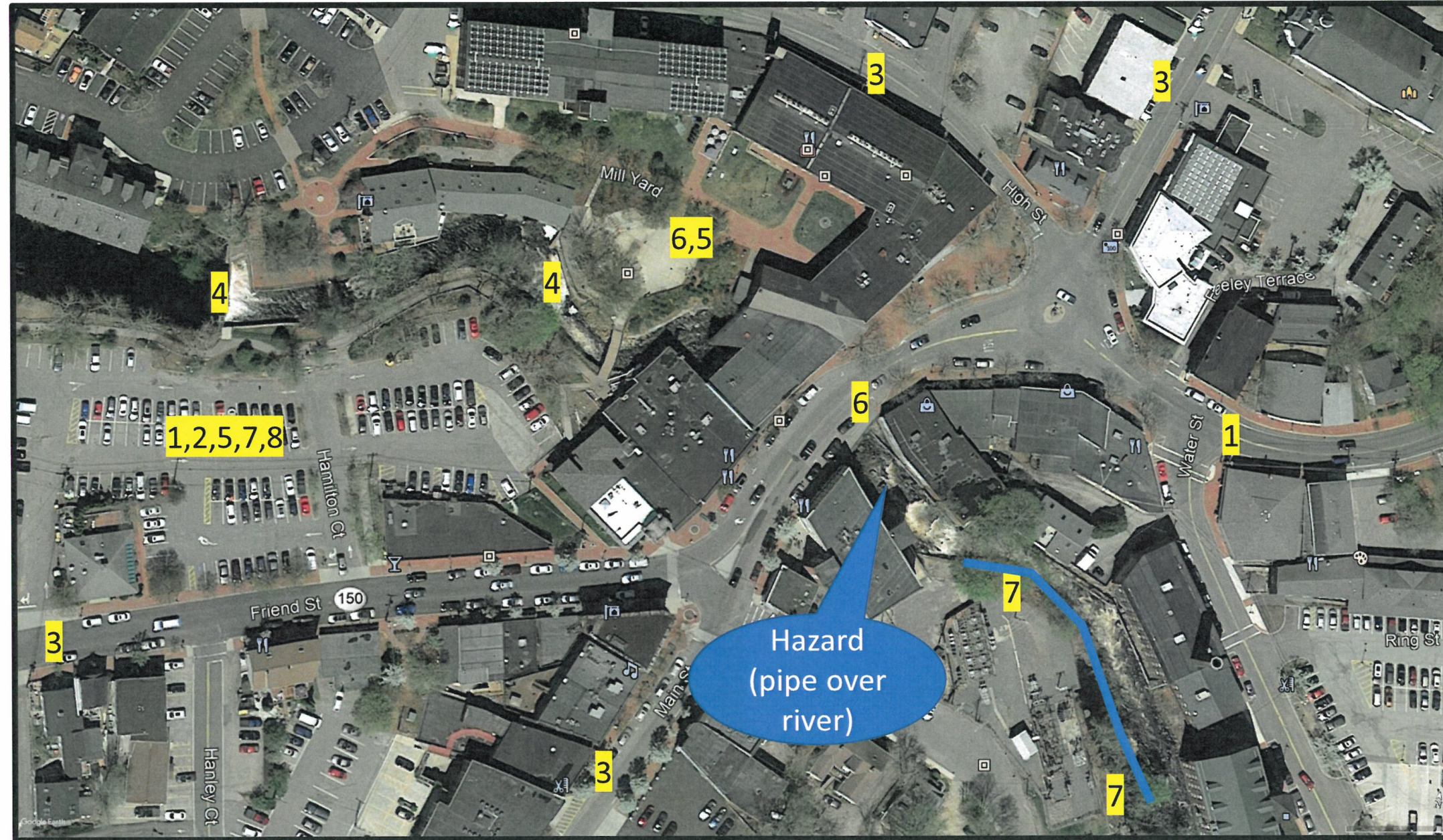
- Related Partnerships and or Regulatory Actions





1. Street tree planting #13
2. Pervious pavement #17
3. Upstream BMP #12
4. Fish Ladder #15
5. Stormwater treatment incorporation #11
6. Educational interpretation #20
7. Bank restoration #3
8. Flood storage subgrade structures#16

- Hazard abatement
- Green architecture
- Green energy features
- Regulatory actions and incentives
- Green infrastructure flood storage



**F: Upper Millyard, Downtown Core, Powwow River**

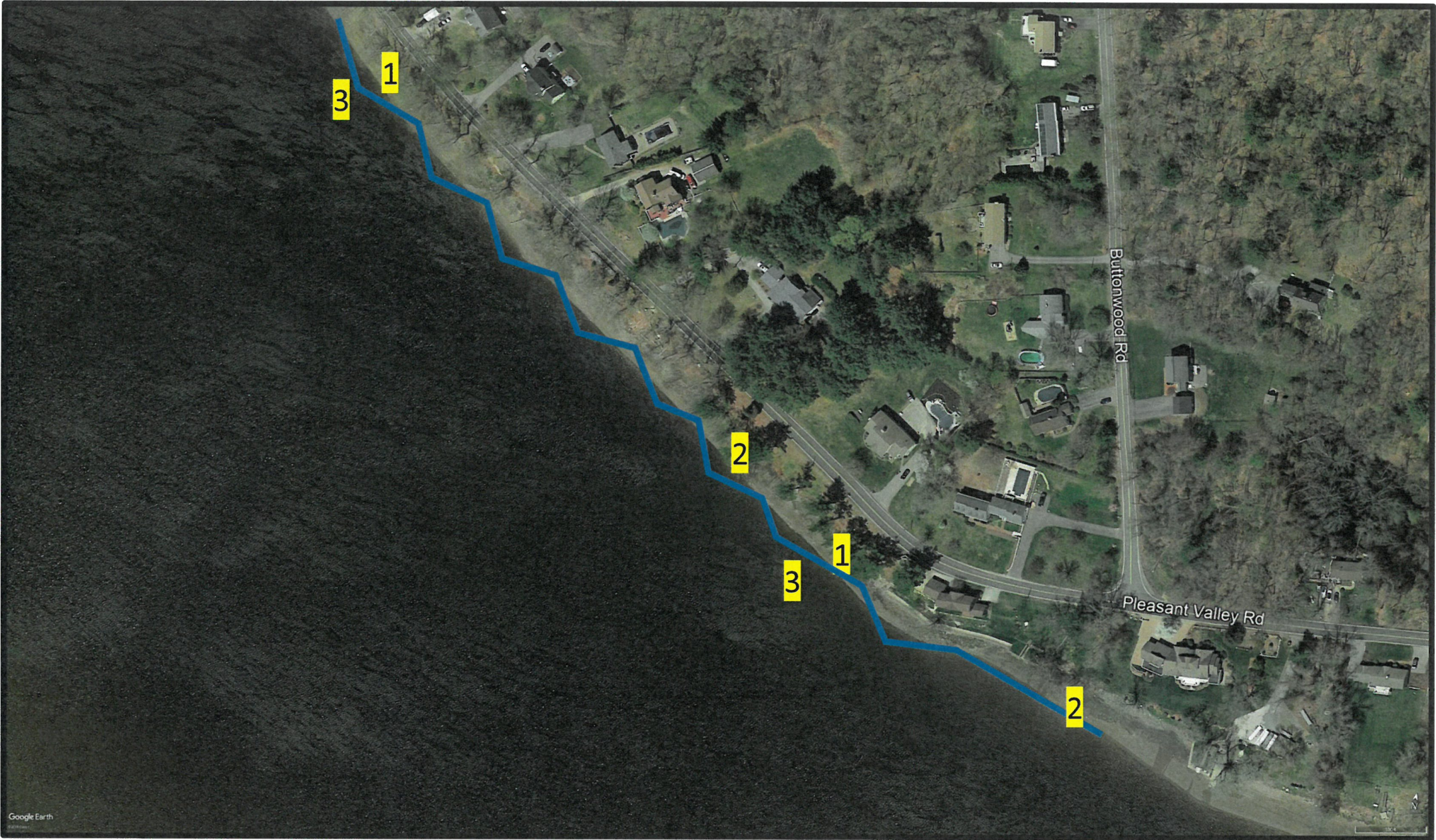
- Related Partnerships and or Regulatory Actions





- 1. Riverbank revegetation #2
- 2. Habitat enhancements #6
- 3. Ice erosion control measures #19

- Coastal storm surge study



**G: Pleasant Valley Rd.**

- Related Partnerships and or Regulatory Actions





1. Riverbank modification #2
2. Habitat enhancements #6
3. Ice erosion control measures #19
4. MSCS culvert replacement #14

- Coastal storm surge study



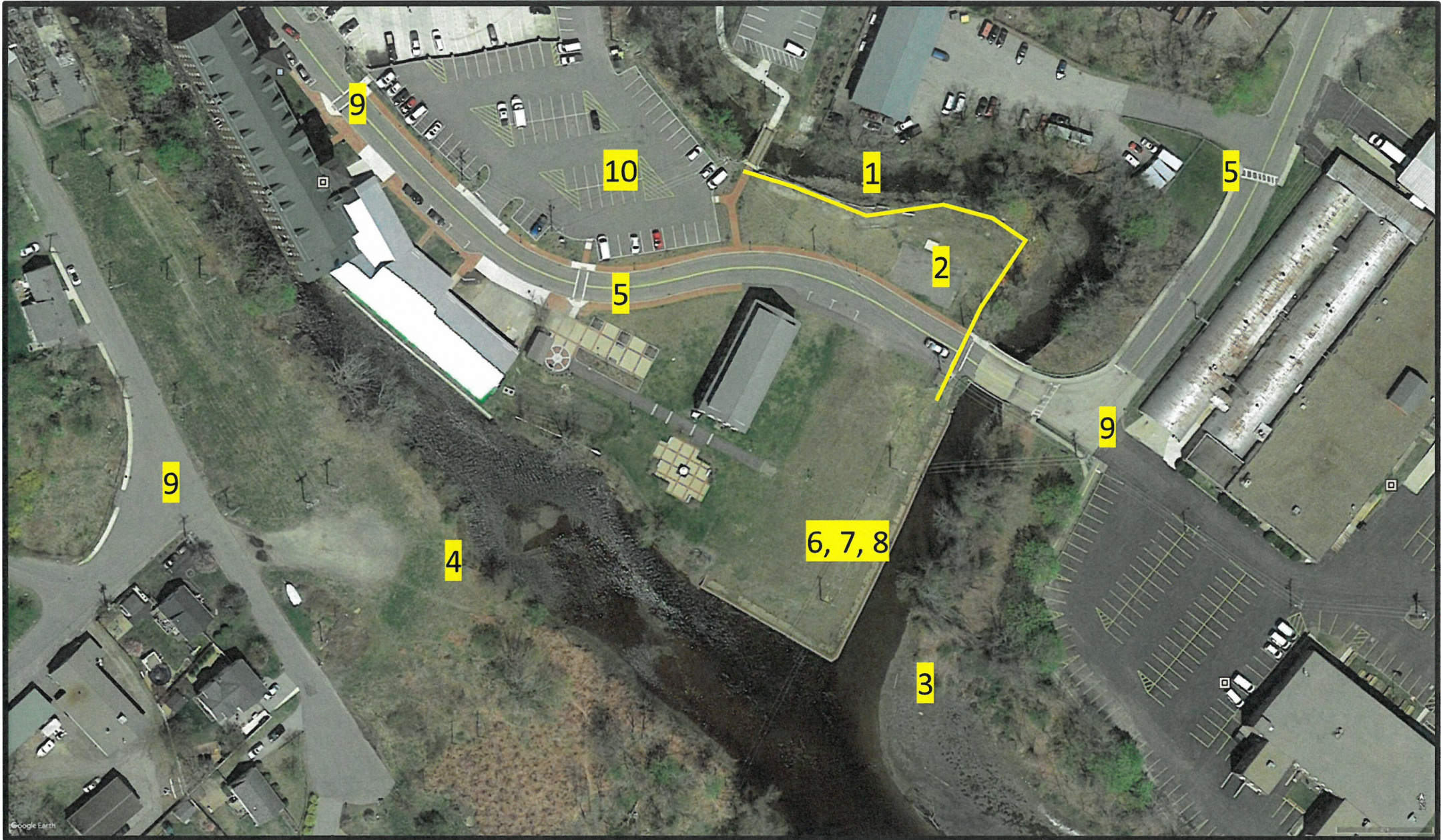
**H:** Pleasant Valley Rd.

- Related Partnerships and or Regulatory Actions





1. Paved trail #23
2. Constructed wetland/ flood storage #16
3. Habitat enhancements #6
4. River Flow Alteration #10
5. Street tree planting #13
6. Accessible canoe launch #24
7. Furnishing gathering space #21
8. Educational interpretation #20
9. Up Stream BMP's #12
10. Pervious parking #17



I: River Walk Downtown

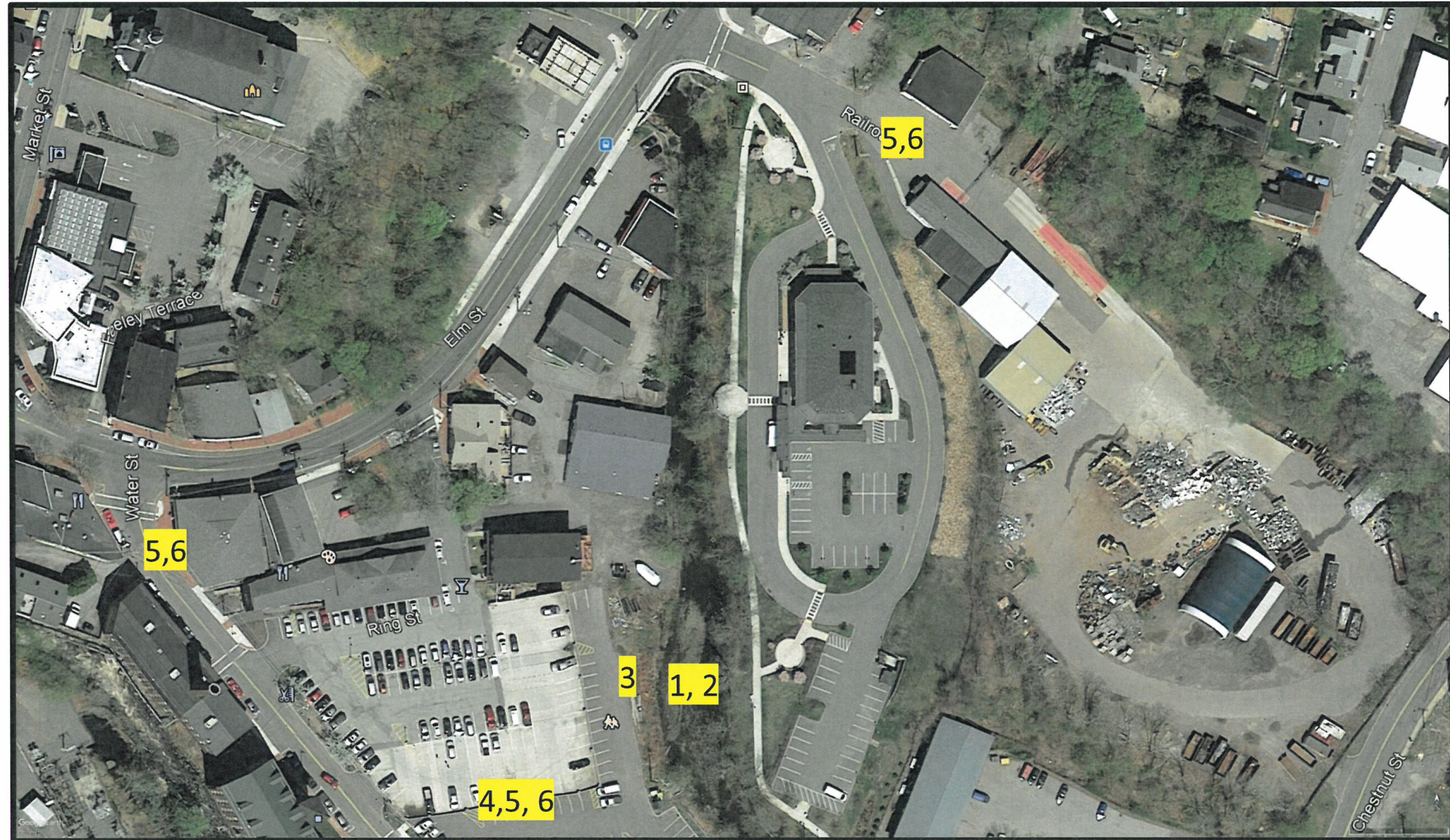
- Related Partnerships and or Regulatory Actions





1. River flow alteration #10
2. Invasive species management #1
3. Educational Interpretation #20
4. Pervious parking #17
5. Street tree planting #13
6. Up Stream BMP #12

- Architectural enhancements
- Green energy



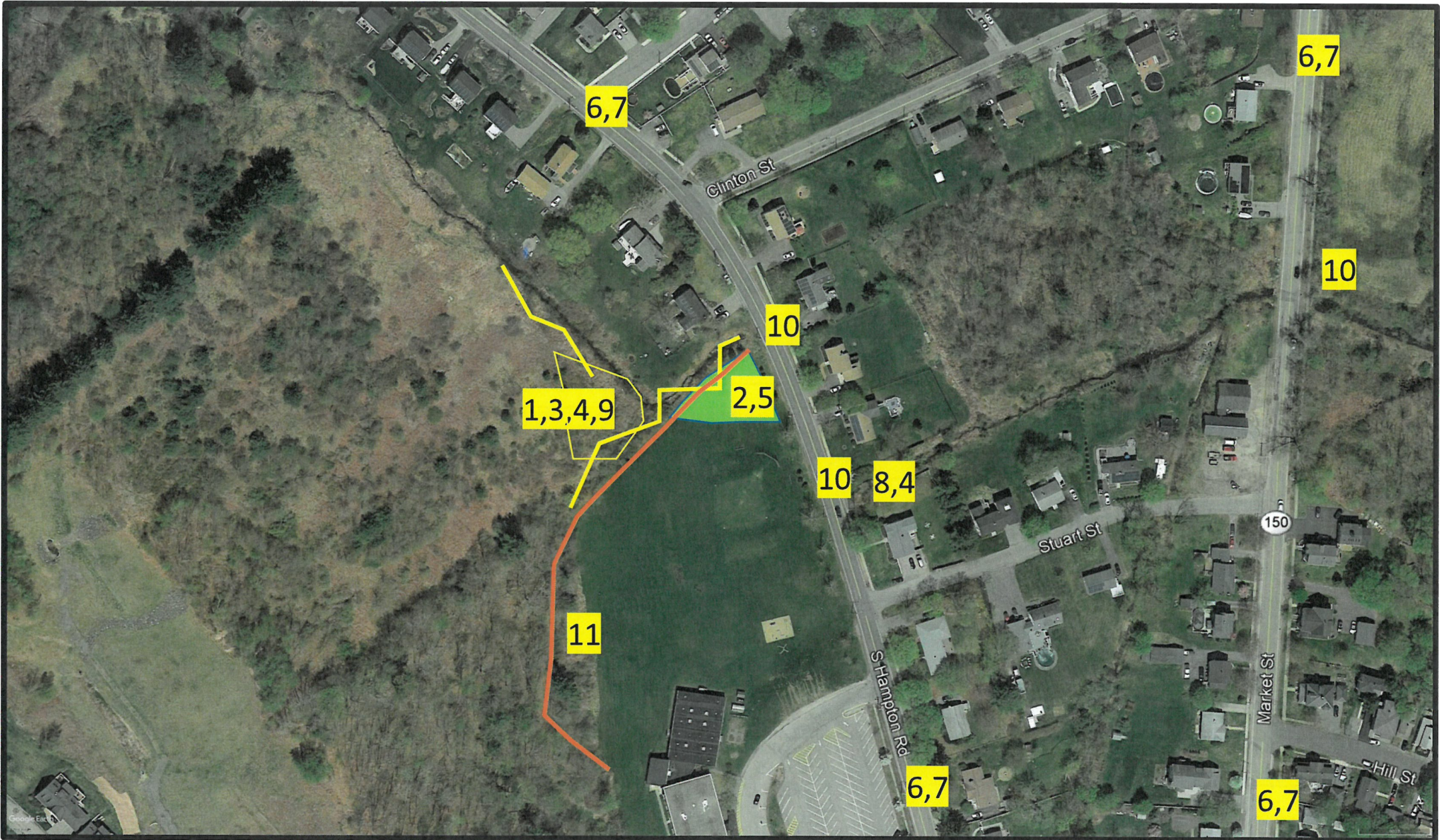
**J: Back River, lower village**

- Related Partnerships and or Regulatory Actions





1. Invasive management #1
2. New wetland/ flood storage #7/#8
3. Habitat enhancements #6
4. Stream flow alteration #10
5. Grassland/ meadow management #3
6. Street tree planting #13
7. Upstream BMP's #12
8. Invasive species management #1
9. Pond creation #9
10. MSCS culvert improvement #14
11. Access paved/ soft trail #22,#23



**K: South Hampton Road**

• Related Partnerships and or Regulatory Actions



## #

## Feasibility

See also CRB Matrix

# = map location, A = regional (X, XX, XXX = LEVEL OF EFFORT)

## AMESBURY MVP ECOLOGICAL RESTORATION AND RESILIENCY OPPORTUNITIES TABLE

Key

Value

## Feasibility

**GOOD**

**BETTER**

**BEST**

See also CRB Matrix

#X

#XX

#XXX

# = map location, A = regional (X, XX, XXX = LEVEL OF EFFORT)

RESTORATION/RESILIENCY OPPORTUNITY																				
24	Accessible Canoe launch															6	X			
25	Boardwalk overlook				1	X														
26	Pedestrian Bridge				1	X														
Related Partnership +/-or Regulatory Actions																				
28	Public private partnership	A	X		9	X					13	XXX	5	XXX			A	XX		
29	Land swap/ land bank																			
30	Zoning overlay	A	X	A	X						14	XXX					A	XX	A	X
31	Resilient redevelopment incentive										15	XXX	4	XXX	5	XXX	A	XX		
32	Coastal storm surge study				A	XXX					15	X	4	XXX	5	XXX	A	XX		
33	City Ordinances - resiliency updates																			
Related Architectural Projects to Consider																				
	Green architectural enhancements: green wall, green roof, white roof, water harvesting etc.										5	X					4	X		
	Green energy features				3	X					7	XX					5	X		
	Hazard abatement (elevated pipe removal)										10	XXX								



