



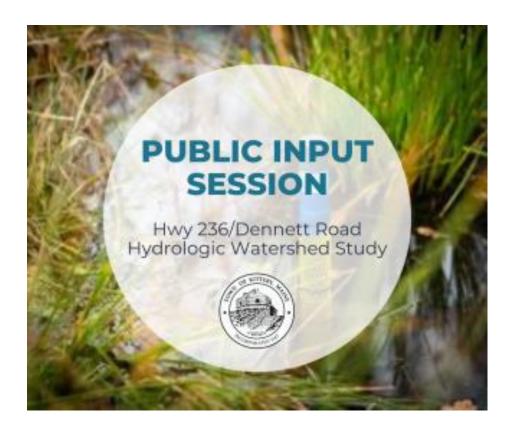
Town of Kittery Highway 236/Dennett Road Hydrologic Watershed Study

PUBLIC MEETING #1 December 15, 2022



## Agenda

- I. Project Team Introductions
- II. Watershed Study Overview
- III. Priority Areas
- IV. Public Participation
- V. Project Schedule





## Project Team Introductions



# Barton & Joguidice







#### Project Team Introductions

- Town of Kittery
- Barton & Loguidice, D.P.C.
- Streamworks, PLLC
- FB Environmental Associates
- Stake Holders



## Watershed Study Overview



## Watershed Study Goals

- I. Evaluate Existing Conditions /
  Areas of Concern
- II. Evaluate Future Hydrologic Scenarios
- III. Nutrient Pollutant Loading Analysis
- IV. Develop Mitigation Alternatives







#### **Evaluate Existing Conditions**

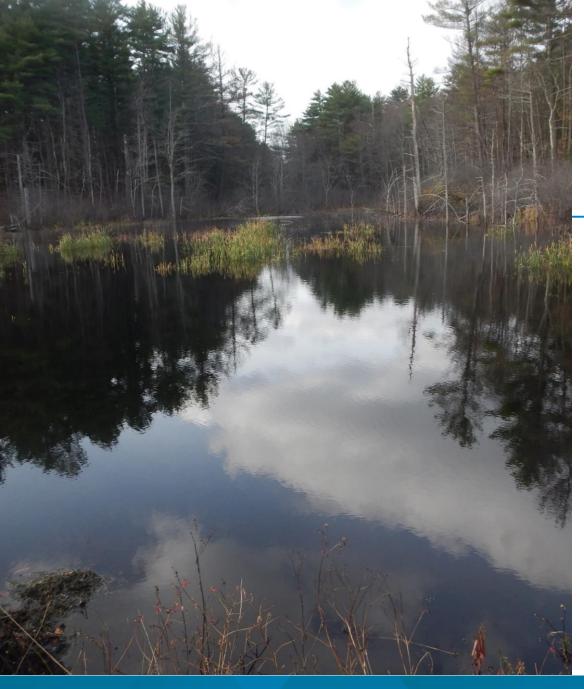
- Data Collection
  - Desktop Delineation
  - Inventory of Known Flooding Locations
  - Inventory of Resources





### **Evaluate Existing Conditions**

- Field Reconnaissance
  - Catalog Stormwater Infrastructure
  - Assessment of Known Flooding Locations
  - Refine Subwatershed Delineations
  - Wetland Mapping





#### **Evaluate Existing Conditions**

- Hydrologic & Hydraulic Modeling
  - Model a range of flood discharges
  - Determine existing stormflow volumes and peak discharge rates
  - Develop comprehensive detailed analysis of existing flood conditions



## Evaluate Future Hydrologic Scenarios

- Modeling Evaluation of Three Build-Out Scenarios
  - No Build
  - Low Density Build-Out
  - High Density Build-Out
  - Extreme Storm Event/Climate Change Scenarios



### Nutrient Pollutant Loading Analysis



Hydrology Water Quality

#### Average annual loads from 30-years of daily fluxes

Related Layer: Weather Stations used in this model. \*\* Turn off

Weather Source: USEPA National Climate Data 1

Simulated by the GWLF-E (MapShed) model 1

| Sources                               | Sediment  | Total<br>Nitrogen | Total<br>Phosphorus |
|---------------------------------------|-----------|-------------------|---------------------|
| Total Loads (kg)                      | 221,271.0 | 2,434.0           | 278.9               |
| Loading Rates (kg/ha)                 | 184.12    | 2.03              | 0.23                |
| Mean Annual<br>Concentration (mg/L)   | 43.00     | 0.47              | 0.05                |
| Mean Low-Flow<br>Concentration (mg/L) | 90.23     | 1.37              | 0.19                |



 Estimate Nutrient Loading From Study Area Subwatersheds

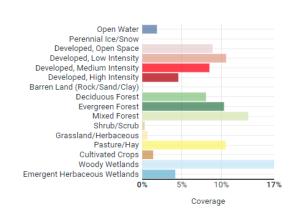
Mean Flow: 5,146,229 (m3/year) and 0.16 (m3/s)

♣ Download this data

- Evaluate existing water quality conditions
- Inform mitigation alternative ranking and selection
- Incorporate Previous Studies (Spruce Creek Watershed Management Plan)

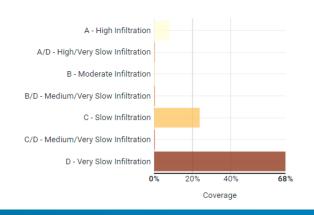
#### Land Use/Cover 2019 (NLCD19)

Related Layer: Land Use/Cover 2019 (NLCD19) ★ Turn off Source: National Land Cover Database (NLCD 2019) ❸



#### Hydrologic soil group distribution

Related Layer: Hydrologic Soil Groups From gSSURGO ✓ Turn on Source: USDA (gSSURGO 2016) €





## Development of Mitigation Alternatives

- Mitigation Alternative Categories
  - Modifications to the Existing Drainage System
  - Installation of Stormwater Detention
  - Installation of Green Infrastructure Stormwater Retrofits
  - Property Protection
  - Flood Damage Protection and Planning
  - Structural Projects
  - Evaluation of Land Use Planning and Zoning
  - Water Quality Improvements
  - Natural Resource Protection / Conservation Opportunities







## Development of Mitigation Alternatives

 Develop Ranking Matrix of Potential Alternatives

Select Prioritized Alternatives





#### Mitigation Alternative Matrix - Prioritization



## RANKING

- Stormwater Benefits (total 55 out of 100 points)
  - Flood reduction (45 points)
  - Nutrient reduction water quality benefit (10 points)
- Constructability (total 20 out of 100 points)
  - Ownership: public or private (10 points)
  - Known constraints (5 points)
  - Permitting (5 points)
- Cost (total 20 out of 100 points)
  - Construction Cost (10 points)
  - Maintenance Cost (5 points)
  - Fundability (5 points)
- Co-Benefits (total 5 out of 100 points)
  - Energy and air quality impacts (1 point)
  - Habitat and biodiversity (1 point)
  - Community and aesthetic benefits (1 point)
  - Human health benefits (1 point)
  - Educational opportunities/visibility (1 point)



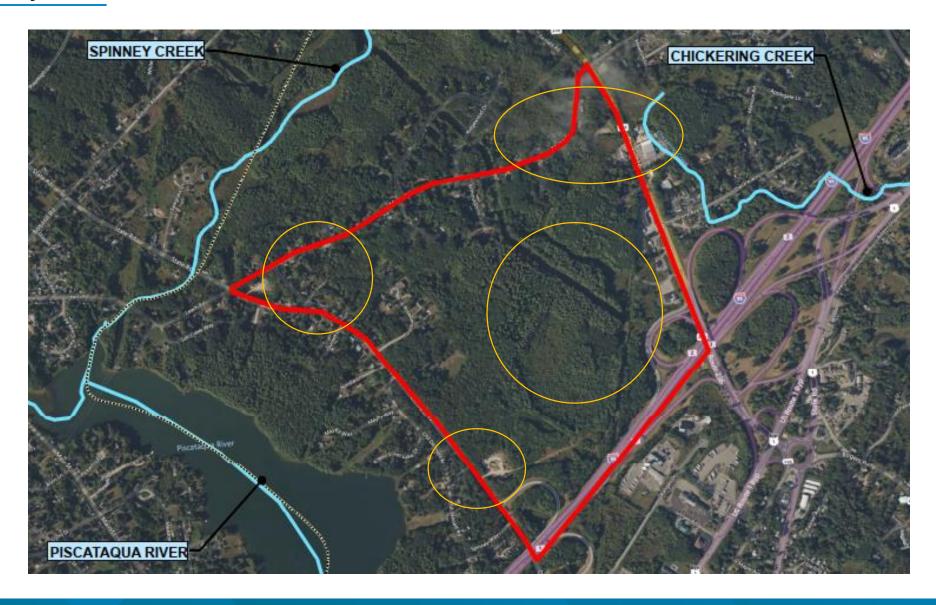




## Areas of Interest

## Preliminary Areas of Interest





## Preliminary Areas of Interest





Martin Rd / Hwy-236



**Spruce Creek Wetlands** 



**Fish and Game Pond** 



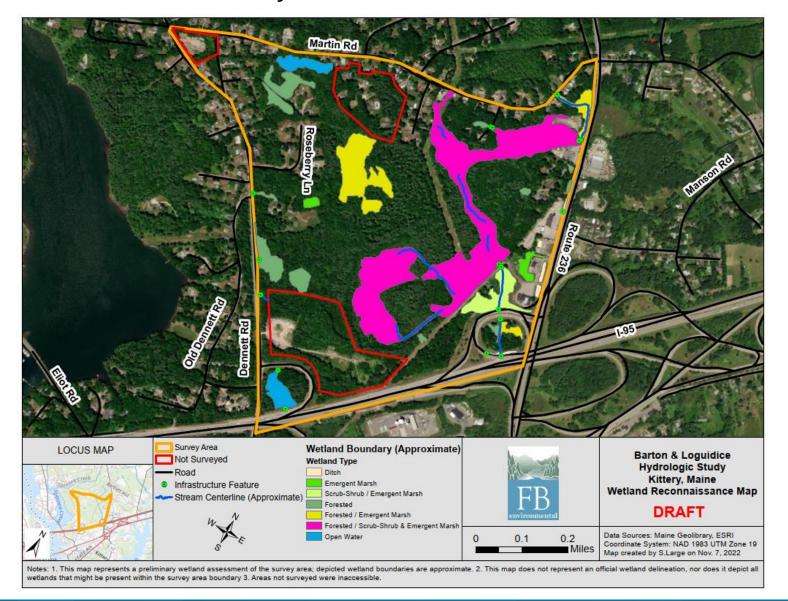
Martin Rd / Hwy-236



**Central Study Area** 

## Preliminary Wetland Inventory







## Public Participation

### Public Participation Resources





- Interactive Mapper Identify problem areas or potential opportunities for watershed improvement
- Community Survey Identify stakeholder priorities and perceptions of the watershed



- Town of Kittery Website
- Interactive Mapper
- Community Survey







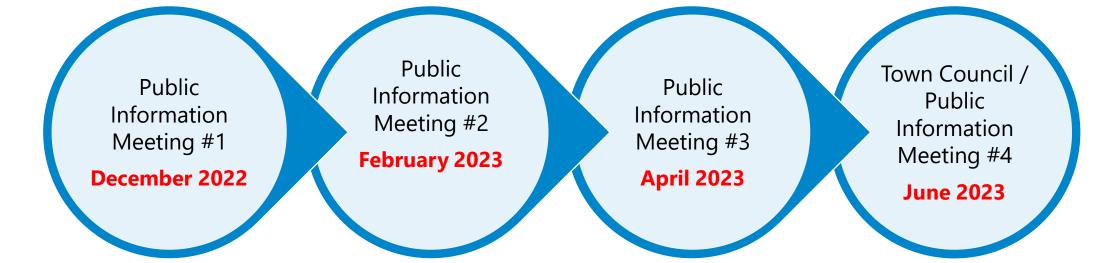
www.kitteryme.gov/watershedinputsession



## Project Schedule & Next Steps

#### Project Schedule





Project Introduction Preliminary
Modeling Results,
Nutrient Loading, and
Resource Inventory

Evaluation of Mitigation Alternative Recommendations, Draft Report

Final Report /
Presentation of
Findings



## Contact Information

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**Project Information**(Survey and Interactive Mapper)

www.kitteryme.gov/watershedinputsession

#### **Project Information**





## Questions & Open Discussion?



<u>Project Information</u> (Survey and Interactive Mapper)

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