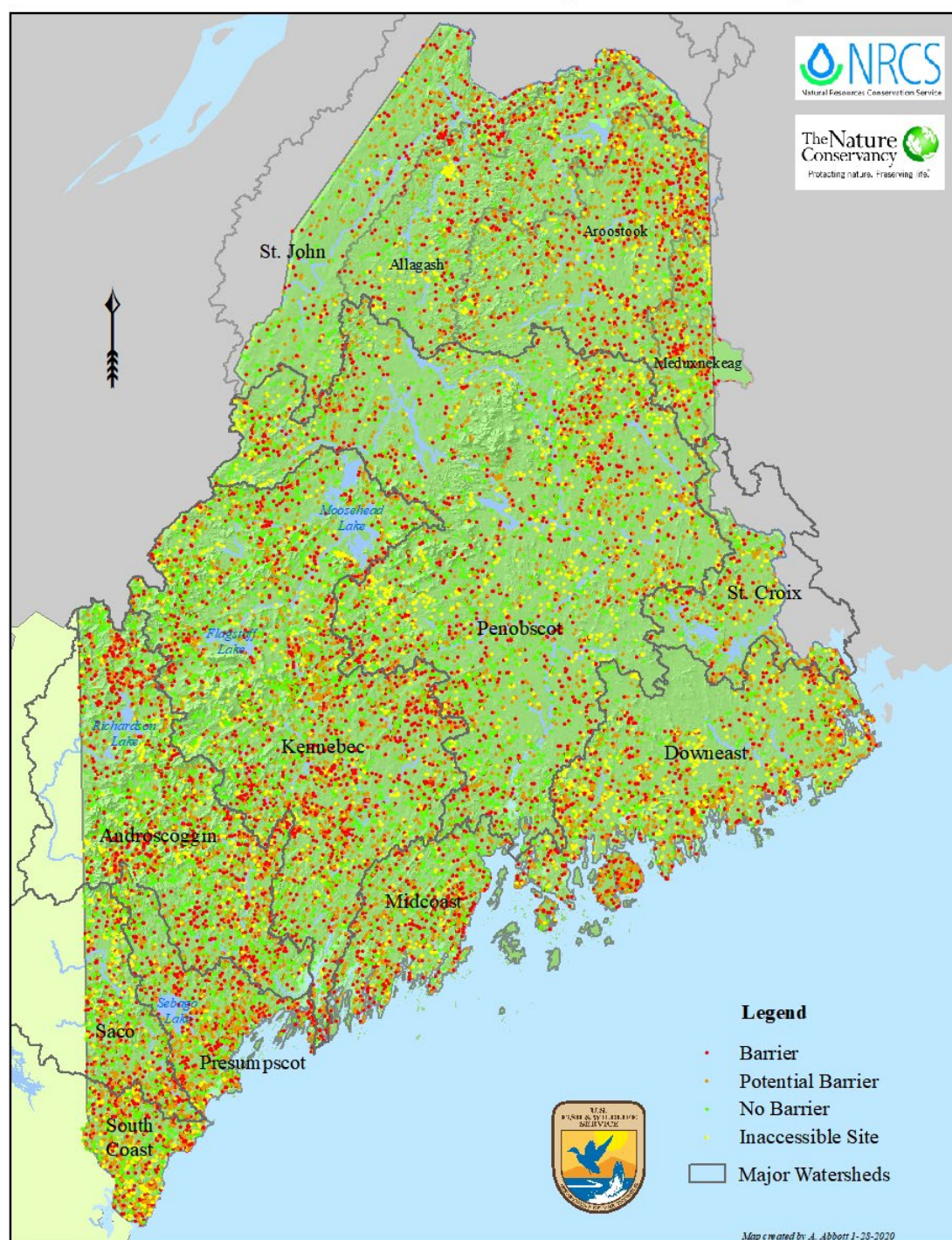


Stream Crossing Data & Prioritization



Alex Abbott - Stream Restoration Specialist



Species Impacted by Barriers



What is the goal?





Fish Passage

Aquatic Organism Passage

Terrestrial Animal Passage

h
h
h

Stream Crossing Classification

-  **Barrier** = Free Fall (Perched) Outlet ($\approx 85\%$)
or Other Severe Physical Barriers
-  **No Barrier** = Span OK *, Inlet & Outlet at Grade,
no significant Physical Barriers, Substrate throughout,
Adequate water depth
-  **Potential Barrier** = All conditions other than above,
including minor or moderate physical barriers, shallow
water depth, lack of substrate
-  **Unknown** = Inaccessible

* At least for fish & other aquatics

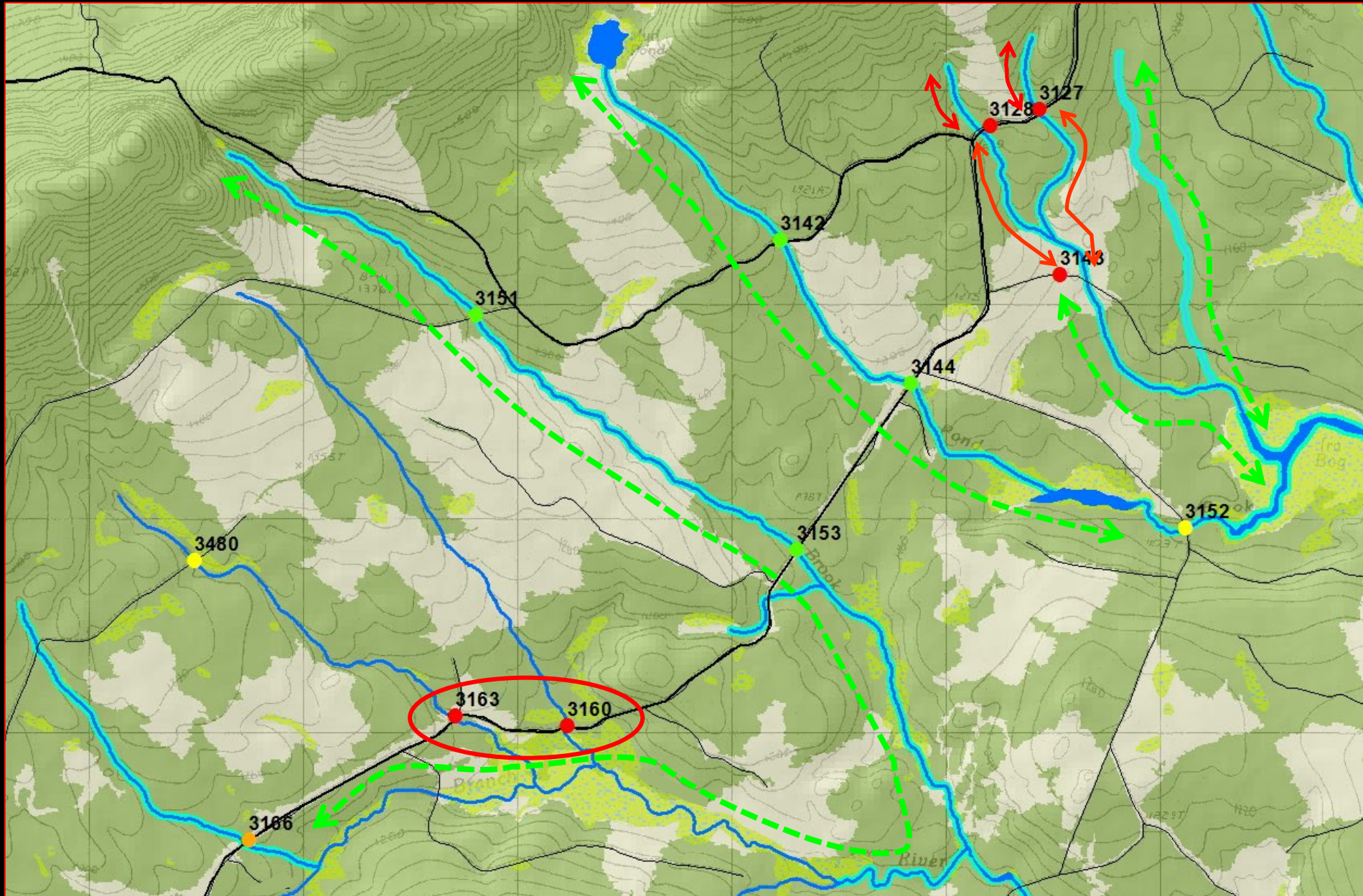
Crossing Data

Barrier Class by Road Class



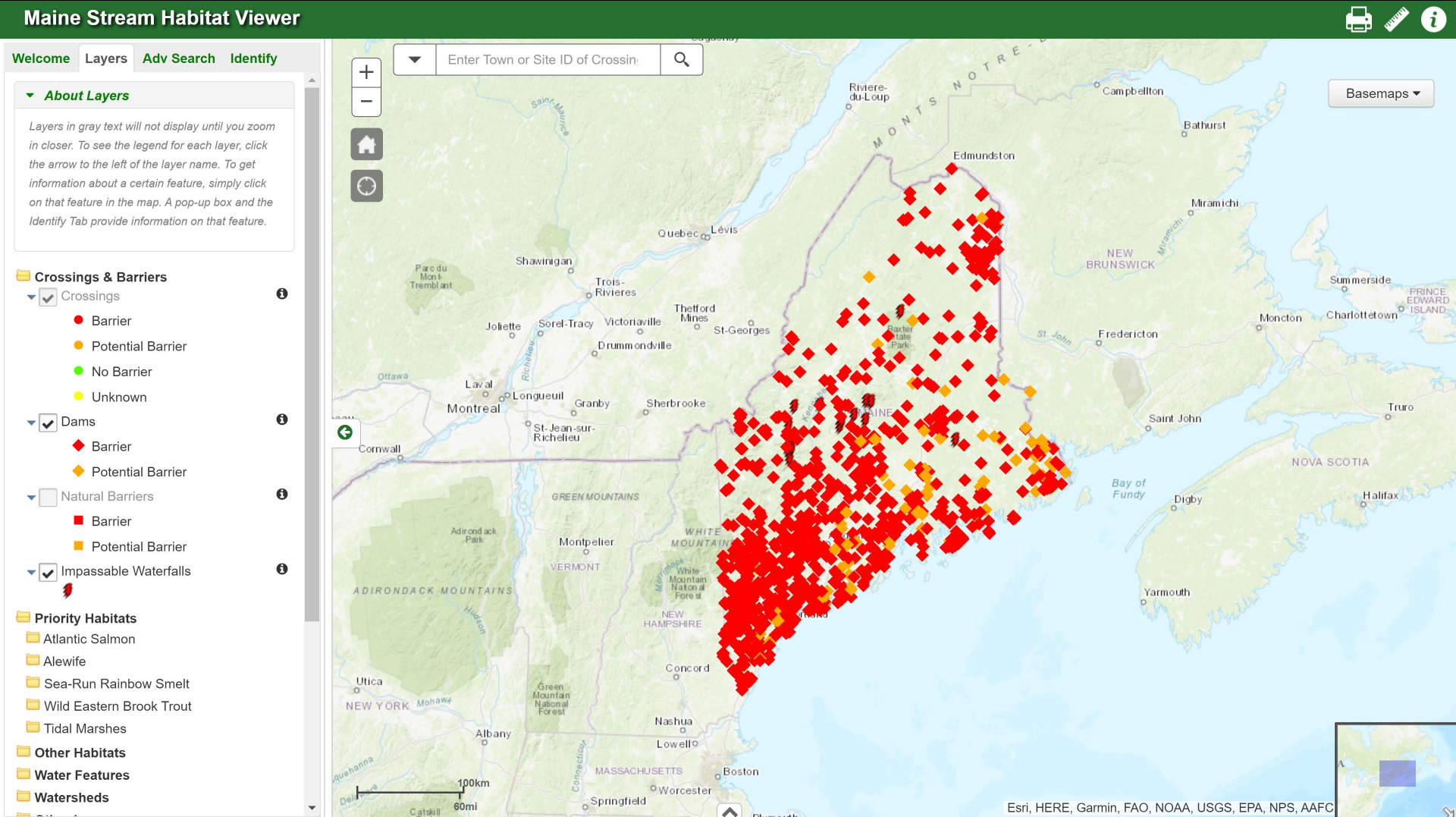
n = 25,338

Crossing Data – BAT Metrics



Online Tools

Maine Stream Habitat Viewer



Online Tools

Maine Stream Habitat Viewer

Maine Stream Habitat Viewer

Welcome Layers **Adv Search** **Identify**

Layer Details:

1 features currently selected

Crossings and Barriers: Crossings

Site ID: 15058
Crossing Type: Culvert
Crossing Class: Barrier
Survey Date: 2010-06-16
Stream: Unknown
Town: Phillips
County: Franklin
Road: Salem Road

[Photos](#)
[Downstream](#) [Inlet](#) [Outlet](#) [Upstream](#)

[Detailed Stream Crossing Information](#)

Latitude: 44.85990
Longitude: -70.34723
Road Type: Paved
Road Class: State
Number Of Culverts: 1
Crossing Condition: No data
Structure Type: Round Culvert
Material: Metal
Inlet Grade: At Stream Grade
Inlet Width (ft): 6.00
Inlet Water Depth (ft): 0.20
Inlet Height (ft): 6.20
Crossing Length (ft): 100.00
Outlet Grade: Free Fall
Outlet Width (ft): 6.00
Outlet Water Depth (ft): 0.10
Outlet Drop (ft): 1.20
Outlet Height (ft): 6.10
Structure Substrate Matches Stream: None
Physical Barriers: No data
Physical Barrier Severity: No data

Map: Phillips

Basemaps

Identify Window:

Total Opening Width (ft): 6.00
Area of Opening (sq ft): 28.30
Estimated Bankfull Width (ft): 10.60
Upstream Blocked Miles: 0.96
Upstream Total Miles: 0.96
Upstream Barriers: 0
Downstream Barriers: 1

Potential Effects of this Crossing

Atlantic Salmon Modeled 100 sq m Habitat Units Blocked: 16.35
Alewife Pond Acres Blocked: -1.00
Wild Eastern Brook Trout Habitat: Yes
Rainbow Smelt Habitat: No data
Tidal Marsh: No data

Copyright: © 2013 National Geographic Society

Online Tools

Maine Stream Habitat Viewer

Maine Stream Habitat Viewer

Welcome Layers Adv Search Identify

About Layers

Crossings & Barriers

- ☒ Crossings
- ☒ Dams
- ☐ Natural Barriers
- ☒ Impassable Waterfalls

Priority Habitats

- ☐ Atlantic Salmon
- ☐ Alewife
- ☐ Sea-Run Rainbow Smelt
- ☐ Wild Eastern Brook Trout
- ☐ Tidal Marshes

Other Habitats

Water Features

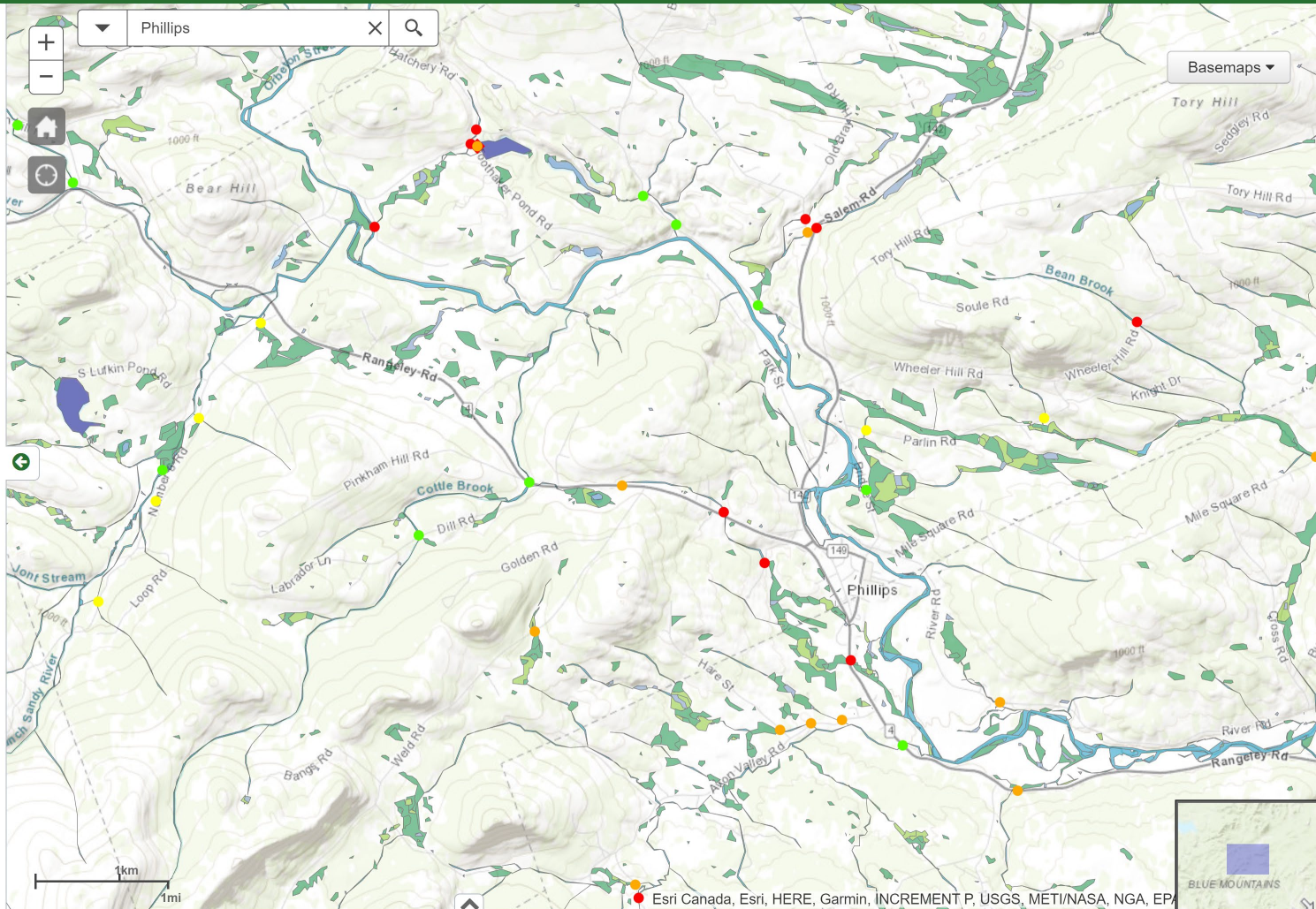
- ☐ Waterbodies
- ☒ Wetlands

Watersheds

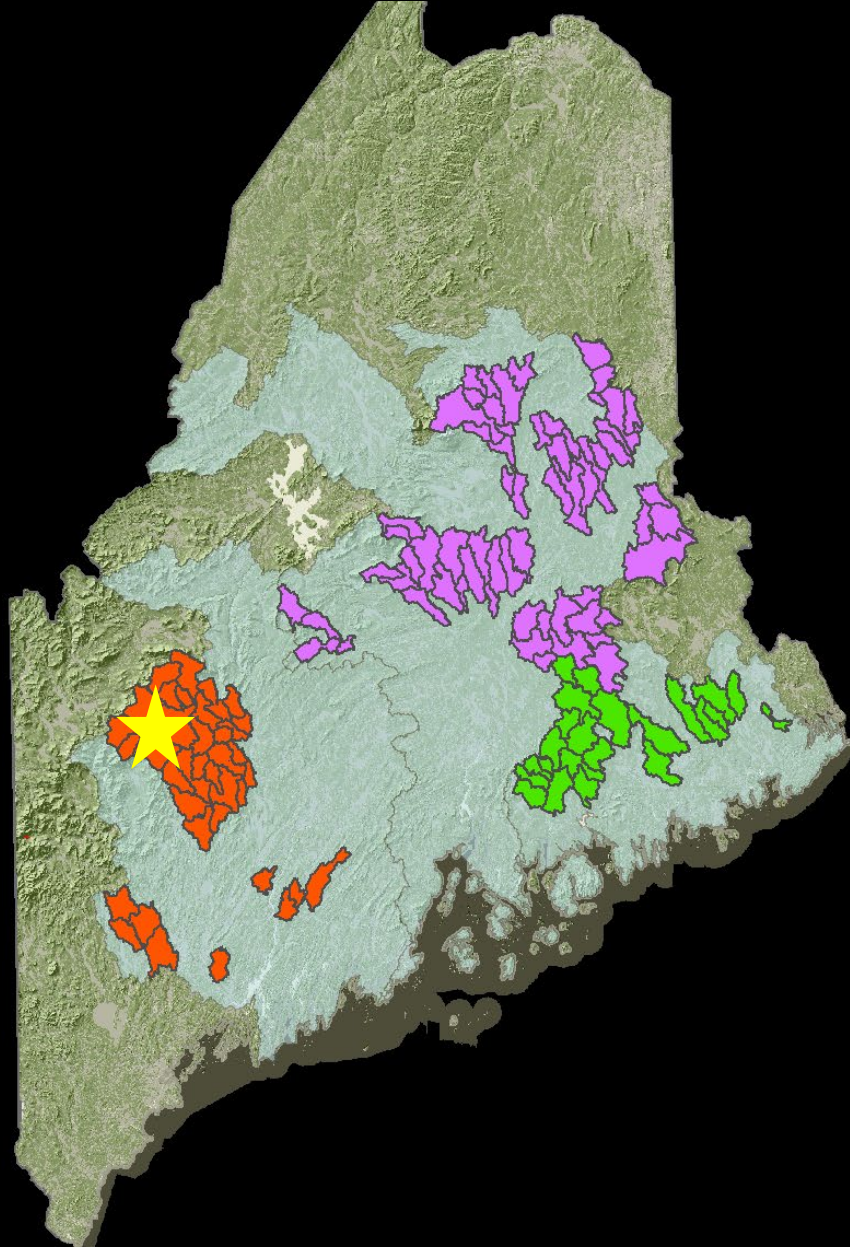
Other Layers

Labels/Hover:

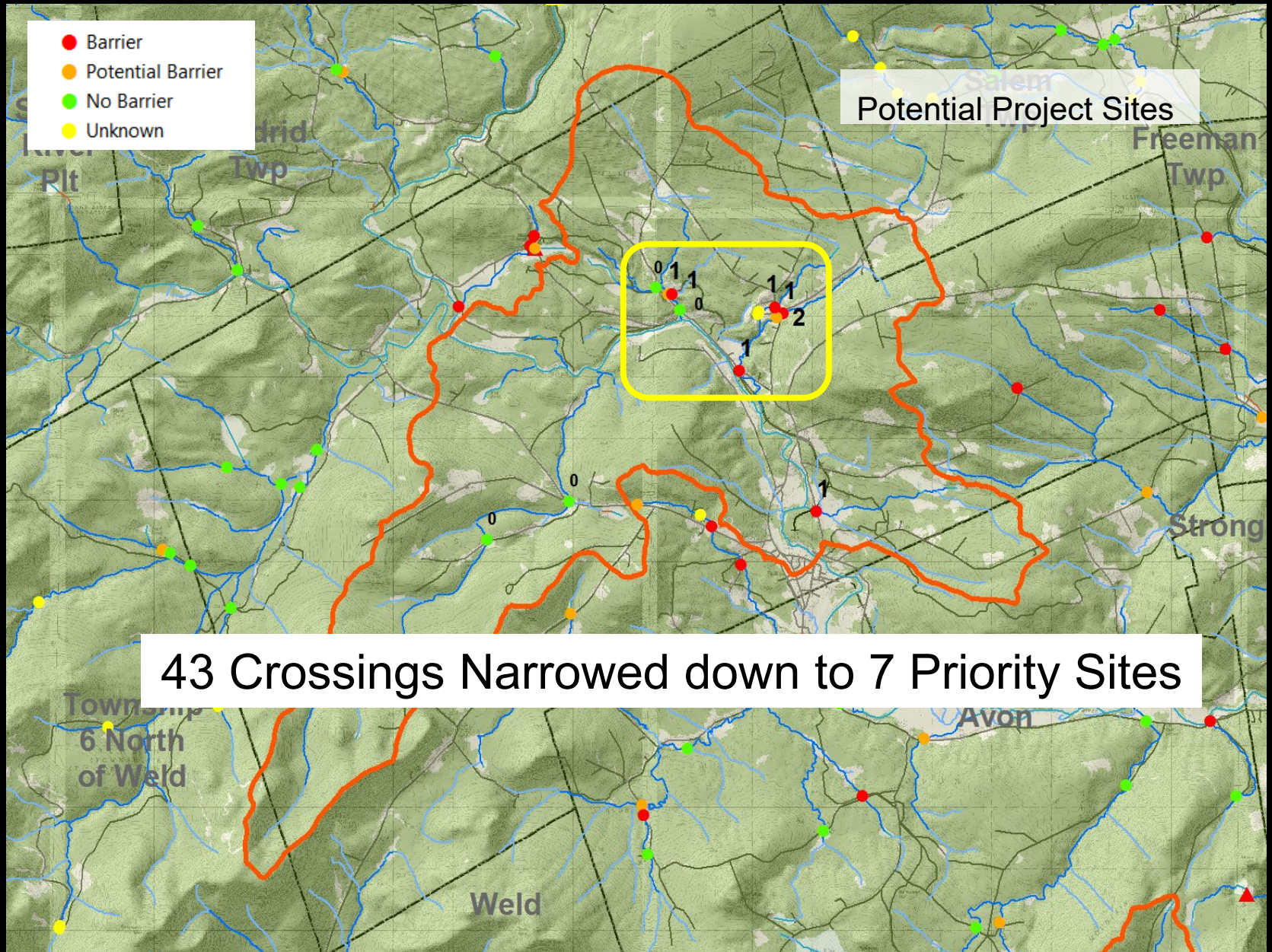
- ☐ Check this box to enable labels on crossings. Labels will appear as you zoom in.
- ☐ Check this box to enable labels on dams. Labels will appear as you zoom in.
- ☐ Check this box to enable your mouse to hover over crossing locations and a small window with limited information will appear. Click on the feature to identify full information.



Prioritization – Salmon Focus Areas



Prioritization – Phillips Focus Area



Online Tools

TNC Flood Risk Explorer



🏠 TNC Maine Mapping Portal

CULVERT FLOOD RISK EXPLORER

AQUATIC BARRIER PRIORITIZATION

COASTAL RISK EXPLORER

FUTURE HABITAT EXPLORER

TNC Maine Mapping Portal



Culvert Flood Risk Explorer

The Culvert Flood Risk Explorer shows the risk level of road flood events in the next 30 years at road-stream crossings across the state, in addition to relevant fish priorities for each crossing. This analysis was performed on public and select private crossings; however, it is not exhaustive and only addresses the flood risk of culverts caused by potential flow restriction.

[GO TO CULVERT FLOOD RISK EXPLORER](#)

Partners:



<https://maps.tnc.org/maine/>


Online Tools

TNC Flood Risk Explorer

The Nature Conservancy

🏠 Maine Mapping Portal / 🏠 Culvert Flood Risk Explorer

Culvert Flood Risk Explorer

Terms & Explanations are accessible in the  icon.

Select Town(s):

Culvert Selection

View culvert summary by flood risk level or explore the information in 'More Detail' below

Flood Risk More Detail

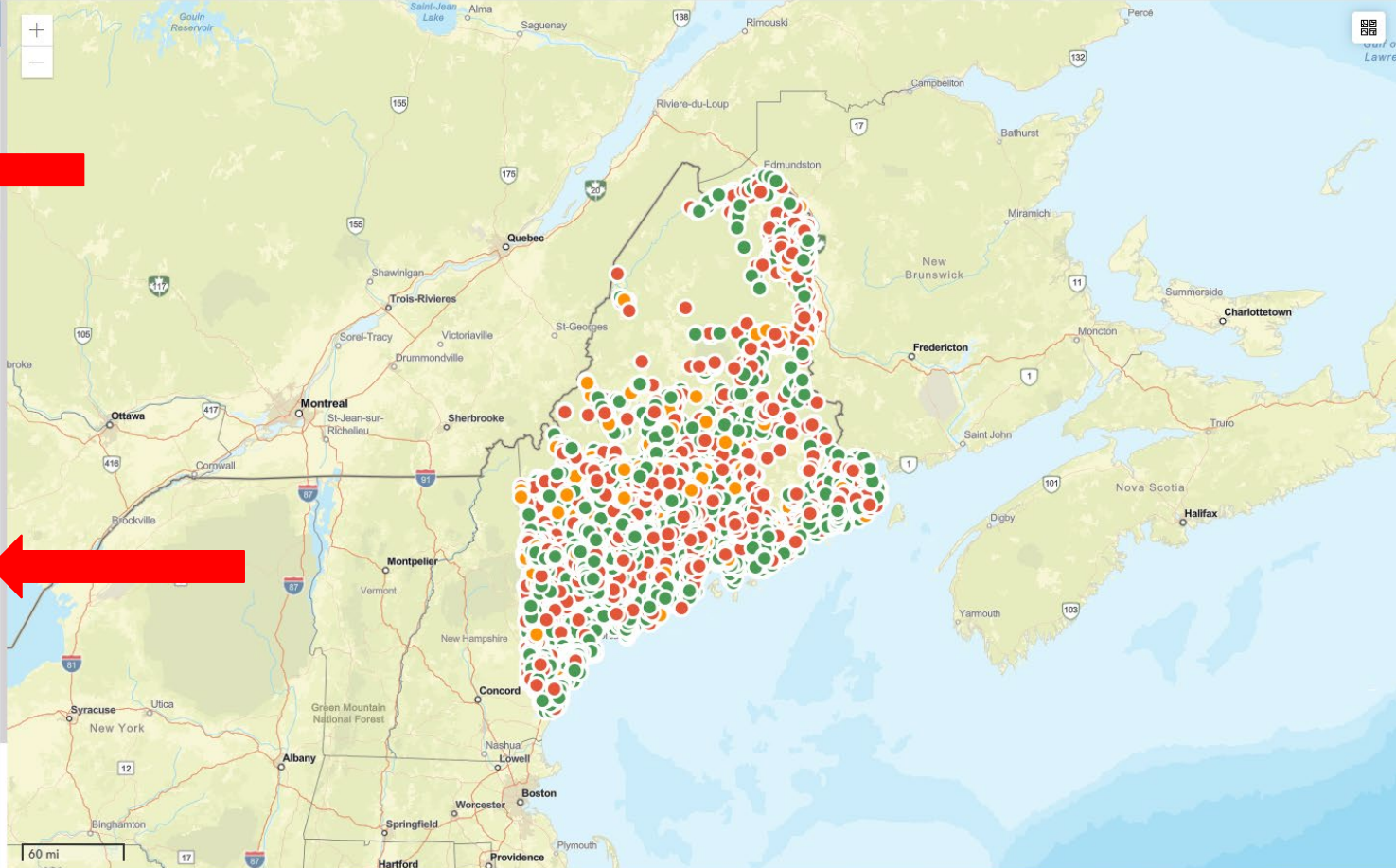
| | Risk of flood in next 30 years: | Culverts affected: |
|-------------------------------------|---------------------------------|--------------------|
| <input checked="" type="checkbox"/> | High | 2300/10426 |
| <input checked="" type="checkbox"/> | Medium | 457/10426 |
| <input checked="" type="checkbox"/> | Low | 3739/10426 |
| <input type="checkbox"/> | N/A | 3930/10426 |

Culverts listed as N/A did not have flood risk or detour calculated due to data availability.

Summary of Culvert Selection

6496 Selected Culverts (out of 10426 in selected town(s))

traffic counts (total daily)



Online Tools

TNC Flood Risk Explorer

To answer the question, we need to know...



CULVERT GEOMETRY

Height and width collected by stream crew

FLOW

Generated by StreamStats
for each recurrence interval



Culvert

Graphics by Nicole Keating, of Wayfinder Studio



CULVERT SLOPE

Determined using GIS

Online Tools

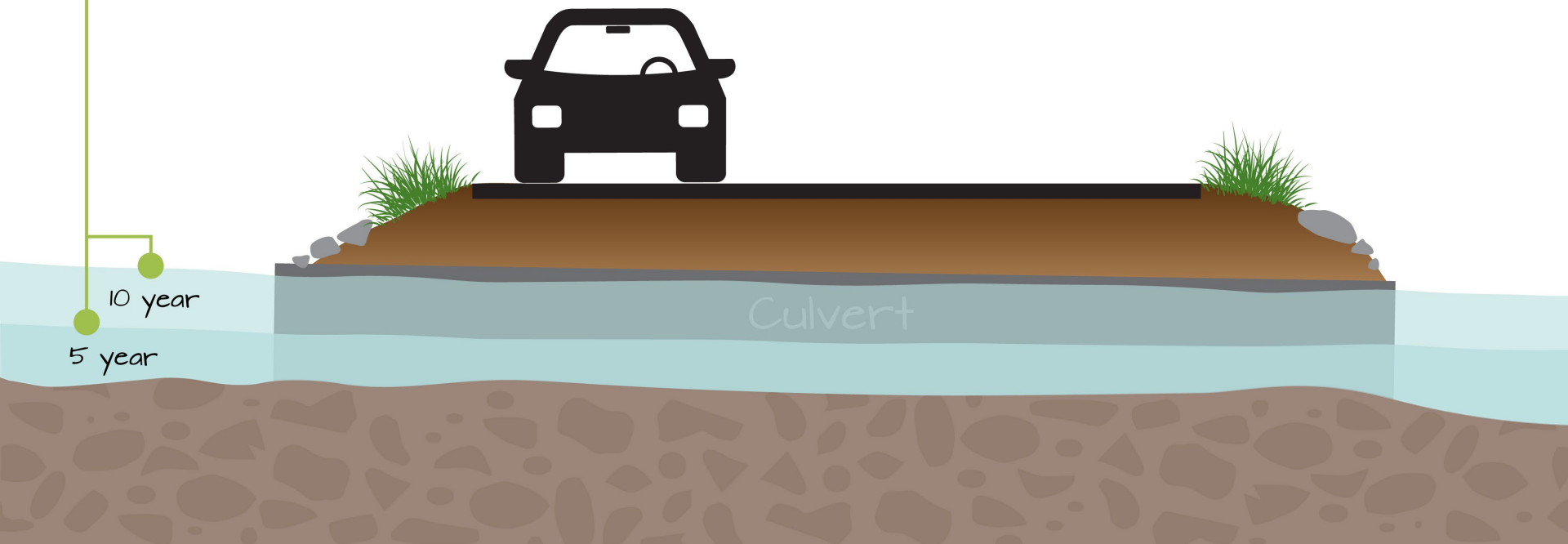
TNC Flood Risk Explorer

which allows us to calculate...



UPSTREAM WATER SURFACE ELEVATION

Calculated using the model for each recurrence interval



Online Tools

TNC Flood Risk Explorer

For example, the 25 year event...



UPSTREAM WATER SURFACE ELEVATION

Calculated using the model for each recurrence interval

Elevation of upstream water surface elevation = 10 feet



ROAD SURFACE ELEVATION

Determined using GIS


Elevation of road surface = 8 feet



Culvert


Online Tools

TNC Flood Risk Explorer



Maine Mapping Portal / Culvert Flood Risk Explorer

Culvert Flood Risk Explorer

Terms & Explanations are accessible in the  icon.




Select Town(s):
1 selected

Norway

Culvert Selection

View culvert summary by flood risk level or explore the information in 'More Detail' below


Flood Risk More Detail

| | Risk of flood in next 30 years: | Culverts affected: |
|-------------------------------------|--|--------------------|
| <input checked="" type="checkbox"/> |  High | 12/21 |
| <input checked="" type="checkbox"/> |  Medium | 2/21 |
| <input checked="" type="checkbox"/> |  Low | 2/21 |
| <input checked="" type="checkbox"/> | N/A | 5/21 |

Culverts listed as N/A did not have flood risk or detour calculated due to data availability.


Summary of Culvert Selection

21 Selected Culverts (out of 21 in selected town(s))




Map showing the location of Sodom Rd over Perry Brook in Norway, Maine. The map displays the road network, water bodies, and the location of the culvert. A red dot indicates the location of the culvert.

Sodom Rd over Perry Brook in Norway




3 of 4


Site ID: 20508

 30 year flooding probability


High

 traffic counts (total daily)


526

 detour length (total miles)

13.87

 fish priorities


Brook Trout Higher Priority
Salmon Medium Priority

 road class

Town


Online Tools

TNC Flood Risk Explorer



Maine Mapping Portal / Culvert Flood Risk Explorer

Culvert Flood Risk Explorer

Terms & Explanations are accessible in the  icon.






Select Town(s):

Culvert Selection

View culvert summary by flood risk level or explore the information in 'More Detail' below

Flood Risk More Detail

Refine Selection

| Flood Risk | Traffic (cars/day) | Detour (miles) | Fish Priorities |
|---|--------------------|----------------|---|
| <input type="checkbox"/> N/A | 64 | 1.9 |  |
| <input checked="" type="checkbox"/> Low | 3880 | 18 |  |
| <input checked="" type="checkbox"/> Low | 873 | 5.8 |  |
| <input checked="" type="checkbox"/> Low | 415 | No Detour |  |
| <input checked="" type="checkbox"/> Low | 194 | No Detour |  |

Summary of Culvert Selection


6496 Selected Culverts (out of 10426 in selected town(s))

Refine Selection


Risk of Flood in the Next 30 Years

☒ High ☒ Medium ☒ Low ☐ N/A

Traffic Count (cars/day) [Ⓢ]



Detour Length (miles)



Detour Value

☒ Calculated ☒ Not Calculated ☒ No Detour

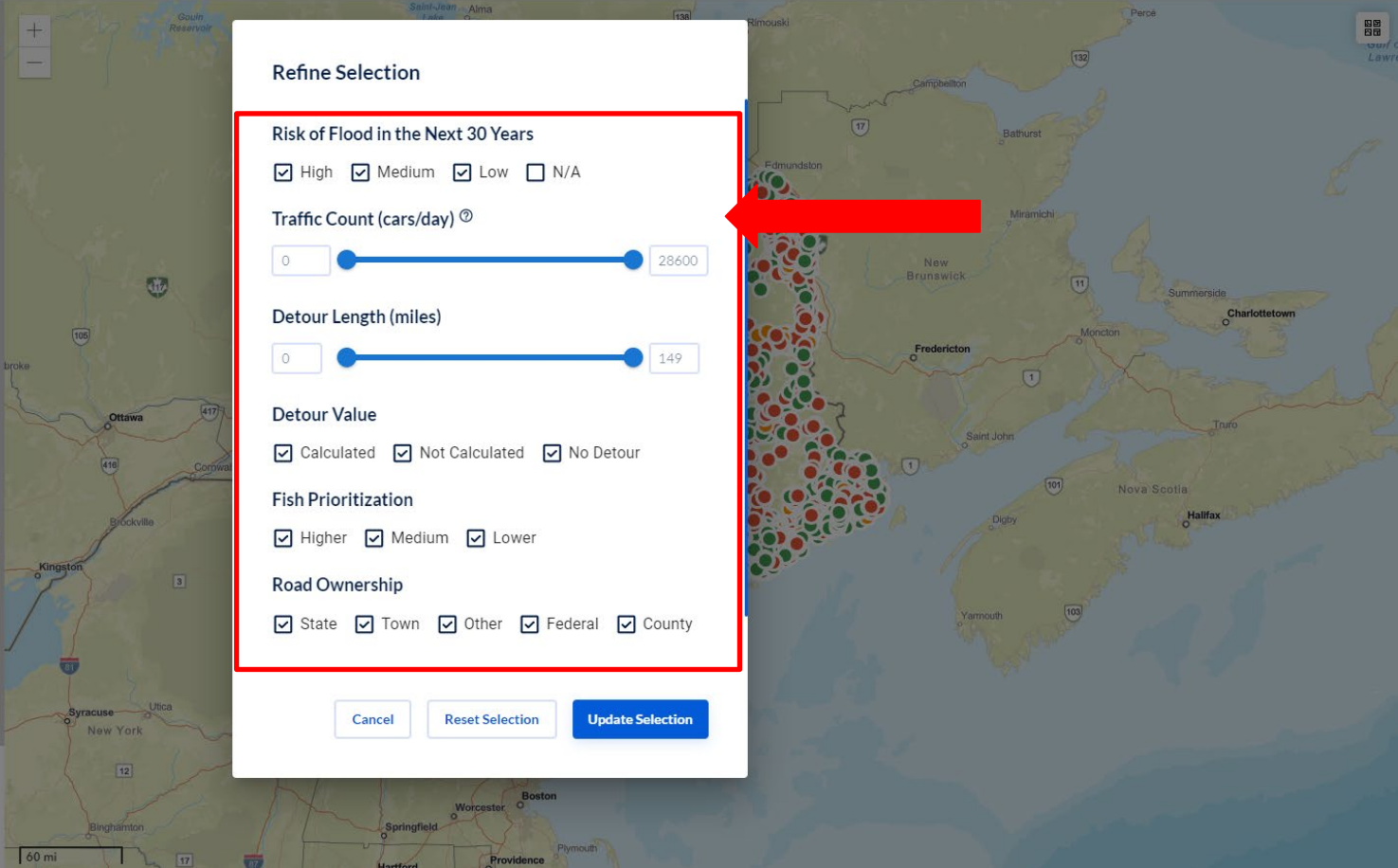
Fish Prioritization

☒ Higher ☒ Medium ☒ Lower

Road Ownership

☒ State ☒ Town ☒ Other ☒ Federal ☒ County

Cancel Reset Selection Update Selection



Data Update Form

STREAM CROSSING SURVEY - DATA UPDATE *

Site ID _____ Installation Date _____

Recorder Name _____ Telephone / Email _____

Town _____ Organization _____

Road _____ Type ☐ Paved ☐ Unpaved ☐ Driveway

Stream _____ Digital Photos Taken ☐ Inlet ☐ Outlet ☐ Other

GPS Coordinates - Lat/Lon [WGS84] ° (N) - ° (W)

If the crossing already has a SiteID, GPS coordinates are optional and used only to confirm correct site location.

Basic Structure Type ☐ Bridge ☐ Culvert ☐ Multiple Culverts # _____ ☐ Ford ☐ Removed Structure

Material ☐ Metal ☐ Concrete ☐ Plastic ☐ Wood ☐ Stone ☐ Other _____

Specific Structure Type: ☐ Round ☐ Pipe Arch/Ellipse ☐ Bottomless Arch ☐ Box Culvert (with bottom)

☐ Box/Bridge w/Vertical Abutments ☐ Bridge w/Sloped Sides ☐ Bridge w/Sloped Sides & Abutments

Inlet Water Depth _____ ft

Outlet Condition Pick One ☐ At Stream Grade ☐ Free Fall ☐ Cascade

Outlet Span _____ ft B) Outlet Clearance _____ ft

Outlet Water Depth _____ ft Outlet Drop _____ ft (if any; vertical drop to water surface)

Crossing Structure Length _____ ft (along stream)

Crossing Substrate ☐ None ☐ Comparable to Stream Bottom AND Throughout Structure? ☐ Yes ☐ No

Sliplined Culvert ☐ Yes ☐ No (Usually plastic pipe inserted into failing pipe with space between filled with grout.)

Comments:

* Data from this form will update the Maine Barrier Database, particularly when replacing (or removing) stream crossings. Call Alex Abbott with questions about this form at 207-415-1472, or send email to AlexOAbbott@hotmail.com, and also send digital photos to this address.
Please include any additional relevant information not appearing to fit fillable form elements in the Comments section.

The crossing data is only good if it is kept up-to-date!

Remember! Restoration doesn't happen overnight
Crossing upgrades will be done over time.

