New Hampshire
Stream Crossing Assessment and Improvement Project – Practical Collaboration and Cooperative Management

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

New Hampshire House Bill 648

Chapter 179 Laws of 2007

Comprehensive Flood Management Study Commission

Final Report

September 2008

Department of Environmental Services	Department of Transportation	Fish & Game Department	Division of Homeland Security and Emergency Management (DOS)
Ensure installed culverts properly sized for passing flows (Wetlands permitting)	Culverts sized for proper hydraulic capacity	Properly designed culverts to adequately pass fish	Responsible for protection of public safety from flood hazards
Criteria development for use of aquatic resource mitigation funds to replace problem crossings	Responsible for stream crossing assets on state road network	State expertise on river/wetland aquatic organisms (fish) and wildlife	Display information in state EOC during flood events
State expertise on river and stream processes	Replace crossings with asset condition issues	Replace crossings with fish passage issues	Work with towns to fund crossing upsize replacements with hazard mitigation funds

Ultimate goal

Targeting of identified most at-risk vulnerable crossings for check during emergency situations/public response. Targeting for replacement using grant funds.

Public safety with sound environmental and fish passage goals at stream crossings

Culvert Assessment Field Form – Geomorphic & Habitat Parameters

Structure ID	Unknown ☐			Structure Number	
Observer(s)/ Organization(s)				Date & Time	
Town		Datum		Latitude (N/S)	
Location				Longitude (E/W)	
SGA Reach ID				Stream Name	
Road Name				Road Type	paved gravel trail railroad
# of shoulder lanes				Crossing Condition	new old eroding collapsing rusted
# of travel lanes		Structure Materials	Concrete Plastic-Corrugated Plastic-Smooth Tank Stone Steel-Corrugated Steel-Smooth Aluminum-Corrugated Other: _____	Structure skewed to roadway	yes no
# of culverts at crossing				Flow Conditions	unusually low typical low higher than average flood conditions
Overflow pipe(s)	yes no				

Geomorphic and Fish Passage Data

General

Floodplain filled by roadway approaches: entirely (> ¾ of floodplain) partially (¼ – ¾ of floodplain) not significant
Structure within ½ mile downstream of a significantly steeper segment of stream: yes no unsure
Culvert slope as compared with the channel slope is: higher lower about the same
Water depth in the crossing matches that of stream: yes no (significantly deeper) no (significantly shallower)
Water velocity in crossing matches that of stream: yes no (significantly faster) no (significantly slower)

Upstream

Structure opening partially obstructed by (circle all that apply): wood sediment wood & sediment deformation of culvert none other: _____

Steep riffle present immediately upstream of structure: yes no
If channel avulses, stream will: cross road follow road cross and follow road unsure
Estimated distance avulsion would follow road: _____ (ft.)
Angle of stream flow approaching structure: sharp bend (45° - 90°) mild bend (5° - 45°) naturally straight channelized straight
Evidence of streambed erosion or aggradation immediately upstream of culvert: erosion aggradation none
Culvert inlet: at grade cascade free fall
Upstream bankfull widths: 1.)_____ 2.)_____ 3.)_____ 4.)_____ 5.)_____ (ft.)

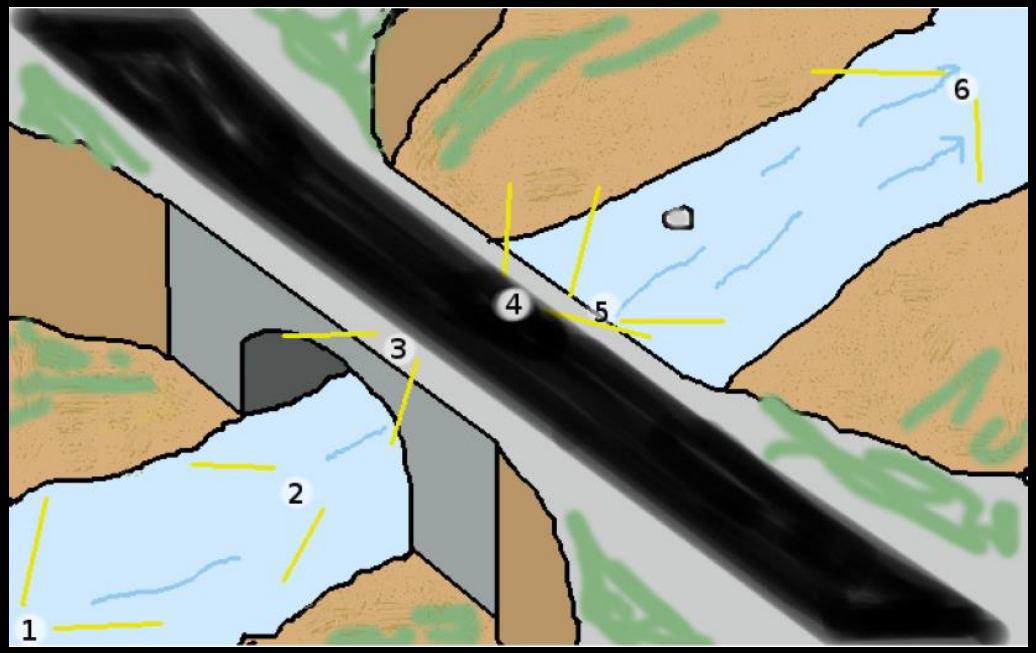
Reference bankfull widths: 1.)_____ 2.)_____ 3.)_____ 4.)_____ 5.)_____ (ft.)

New Hampshire's Stream Crossing Assessment form

- 2 Forms – 1 for culverts; 1 for bridges and arches
- 66 Parameters total
- Parameters allow for three compatibility characterization types:
  - Geomorphology
  - Aquatic organism passage
  - Hydrology
- ArcPad and iPad app data entry also supported
- Multiple stakeholders in design and annual modification
- NHGS has been the steward of the form since 2009.

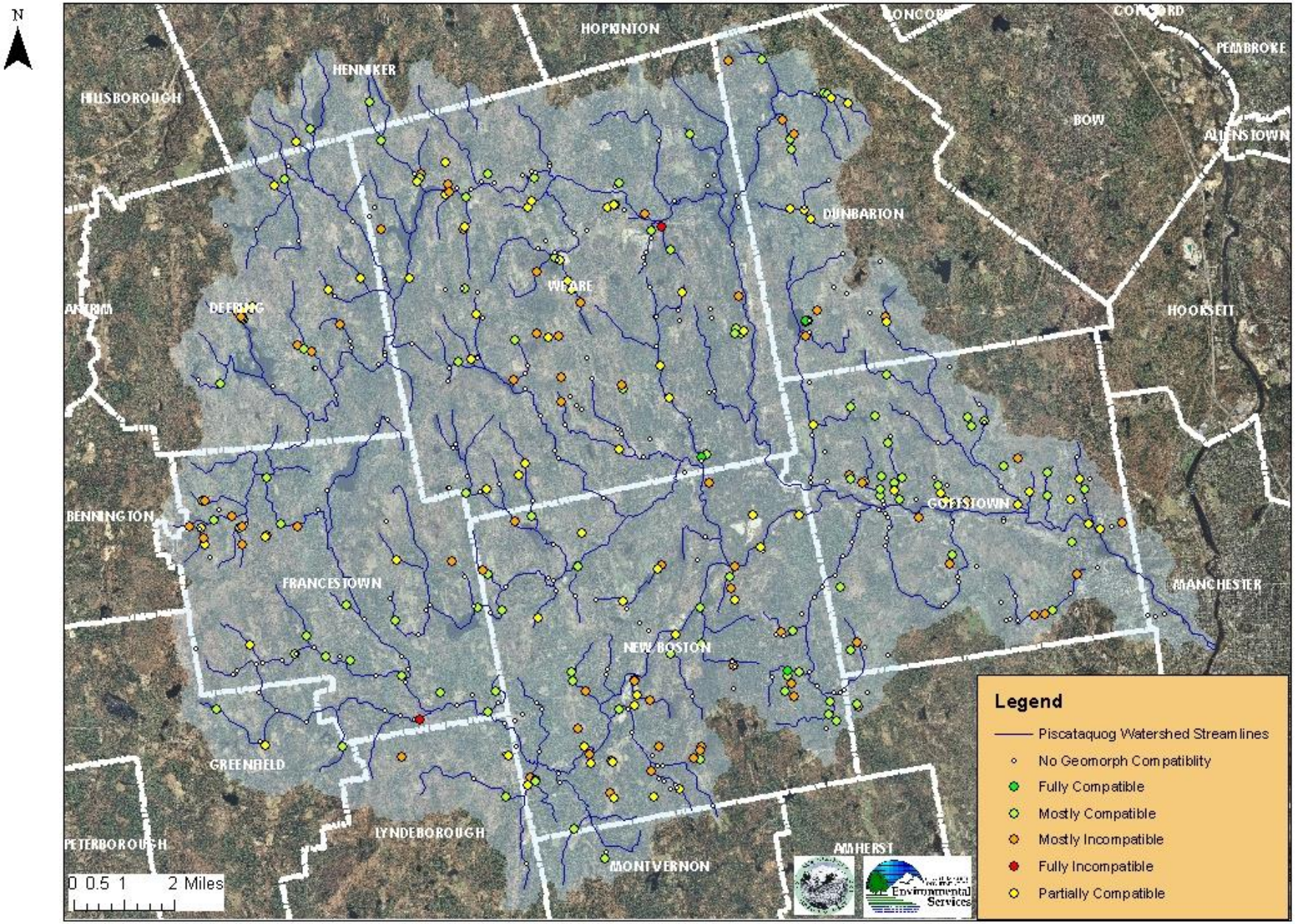
2009-2014 – Culvert assessments in NH funded largely through DES

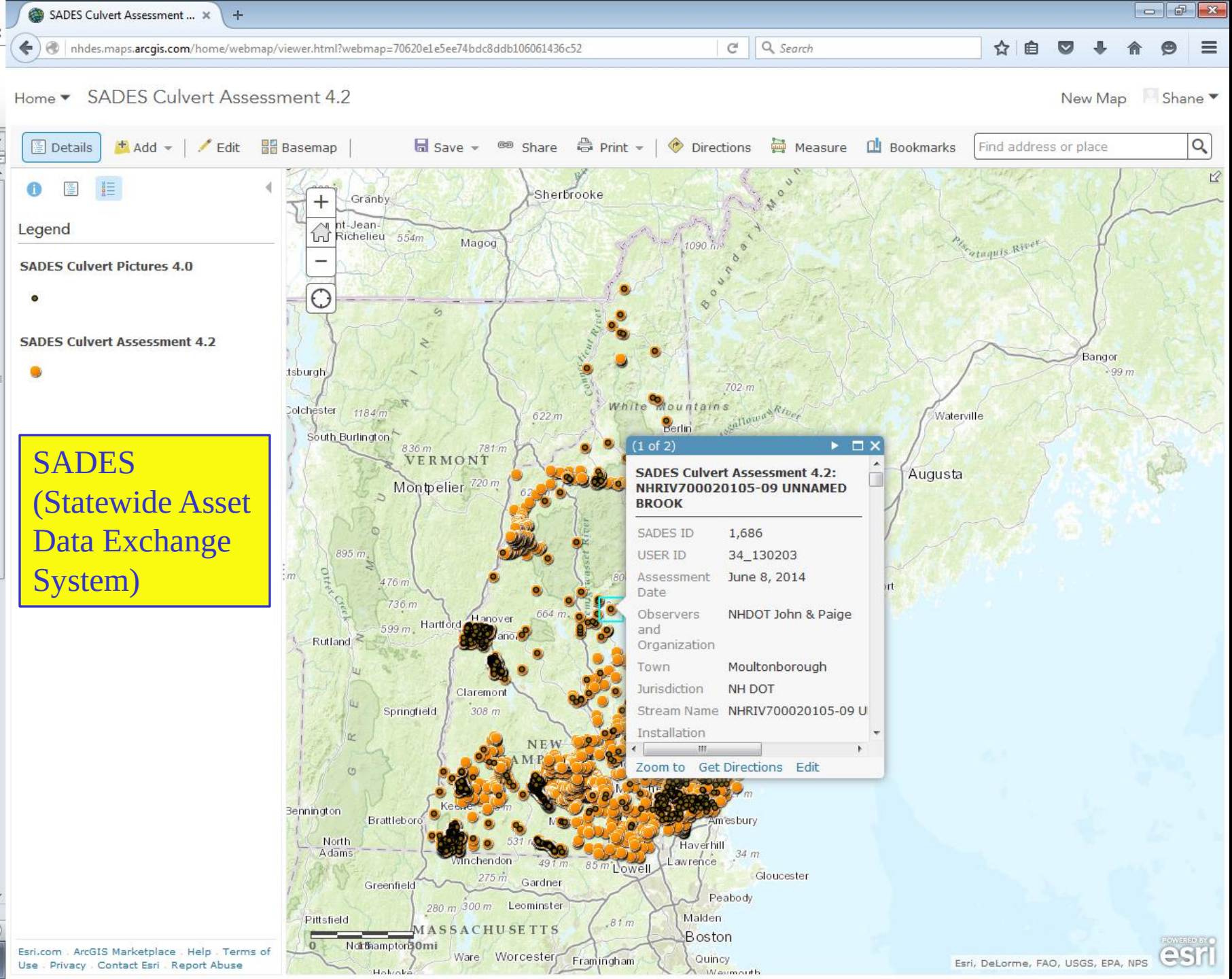
Quality Control Review Process



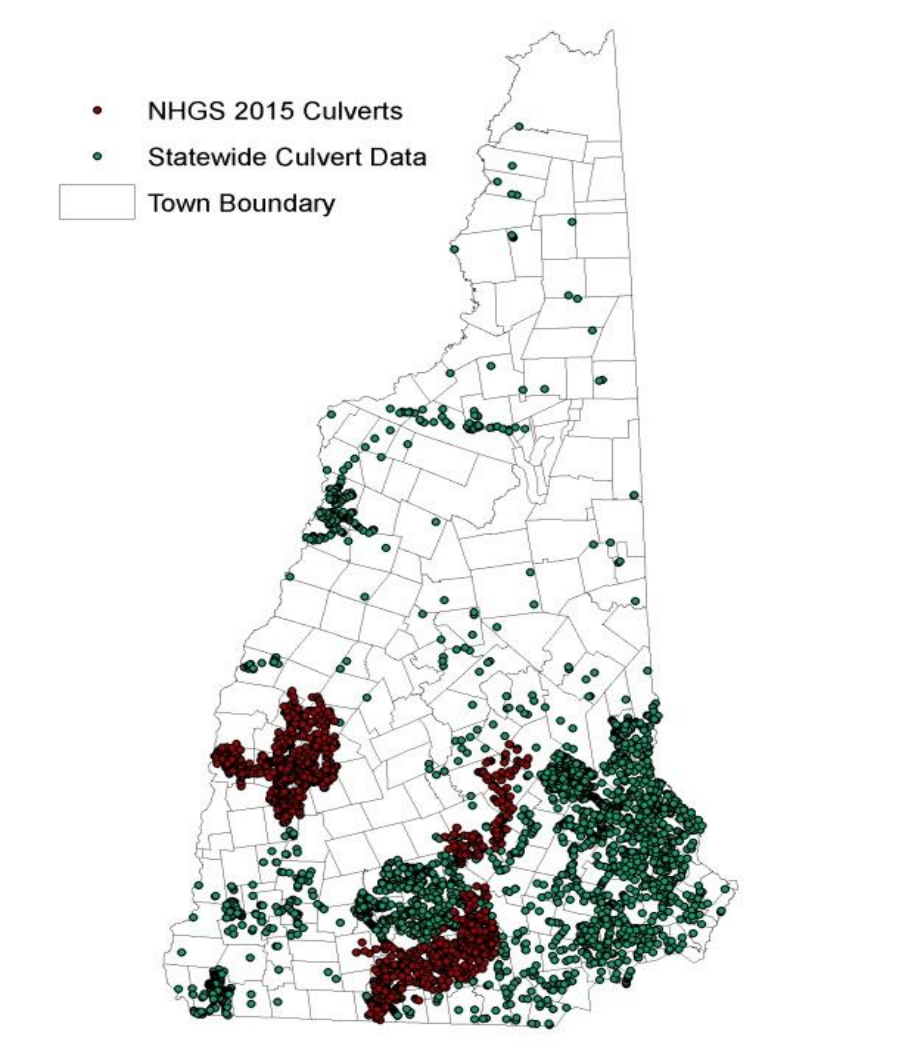
- 6 photos per crossing
- Cross-reference of photos with data
- Issues/comments to collectors

Results of Geomorphic Compatibility Rankings
Piscataquog River Watershed




SADES Culvert Assessment ...
nhdes.maps.arcgis.com/home/webmap/viewer.html?webmap=70620e1e5ee74bdc8ddb106061436c52
Search
Home
SADES Culvert Assessment 4.2
New Map
Shane
Details
Add
Edit
Basemap
Save
Share
Print
Directions
Measure
Bookmarks
Find address or place
Legend
SADES Culvert Pictures 4.0
SADES Culvert Assessment 4.2
SADES (Statewide Asset Data Exchange System)
(1 of 2)
SADES Culvert Assessment 4.2: NHRIV700020105-09 UNNAMED BROOK
SADES ID 1,686
USER ID 34_130203
Assessment Date June 8, 2014
Observers and Organization NHDOT John & Paige
Town Moultonborough
Jurisdiction NH DOT
Stream Name NHRIV700020105-09 U
Installation
Zoom to
Get Directions
Edit
Sherbrooke
Granby
Magog
Berlin
White Mountains
Bangor
Waterville
Augusta
Montpelier
VERMONT
South Burlington
Hartford
Hanover
Rutland
Claremont
Springfield
Keene
Brattleboro
Bennington
North Adams
Winchendon
Lowell
Lawrence
Haverhill
Amesbury
Gloucester
Peabody
Malden
Boston
Gardner
Leominster
Greenfield
Pittsfield
Northampton
Ware
Worcester
Framingham
Quincy
MASSACHUSETTS
Esri.com . ArcGIS Marketplace . Help . Terms of Use . Privacy . Contact Esri . Report Abuse
Esri, DeLorme, FAO, USGS, EPA, NPS
esri

New Hampshire by the Numbers



Time	Culverts assessed
2009 – 2014	1087
2014 – 2015 (RPCs)	1040
2015 (NHGS summer interns)	1323

Total: 3450 (~21.5% of state)

*Of known crossings in the state

Intersection of NHD and road network

Many more crossings that we do not know about

New Hampshire
State Stream Crossing Steering Team

New Hampshire Department of Environmental Services (lead)
- New Hampshire Geological Survey
- Wetlands Bureau (Lori Sommer)

New Hampshire Department of Transportation (co-lead)

New Hampshire Fish and Game Department (co-lead)

New Hampshire Division of Homeland Security and Emergency Management (partner)

- Based on a “governance model” (distributive management structure) that directs the operation of the team
- Each agency is responsible for condition data and criteria development based on specific missions and expertise
- All assessments are coordinated – minimize duplication of effort
- Consistent messaging to the public on data outputs and scoring
- Starting this summer – collection of both transportation and environmental portions of protocol (one stop shopping).

Statewide Asset Data Exchange Service (SADES)

SADES is a cloud based solution to effectively and uniformly collect critical infrastructure data on a statewide level that provides specifications, methods, training, and data exchange services for all stakeholders.

New Hampshire Technology Transfer Center

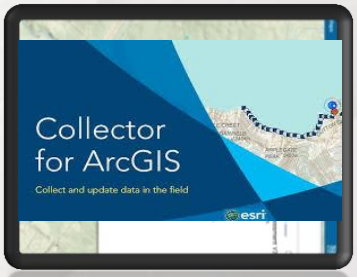
NEW HAMPSHIRE DEPARTMENT OF Environmental Services

NHARPC

New Hampshire DOT Department of Transportation

SADES

Data -> Information -> knowledge



New Hampshire DOT
Department of Transportation

Sharing

Data -> Information -> knowledge

DOT

DES

F&G

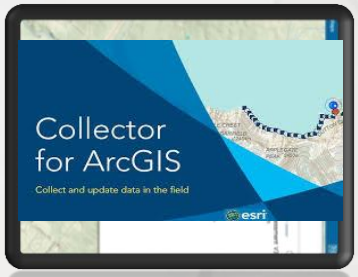
RPCs

DOT

DES

F&G

New Hampshire DOT
Department of Transportation



Stream Crossing

SADES

Data Sharing

NHDOT
Condition Data

NHDES
Geomorphic Compatibility Data

Core Data

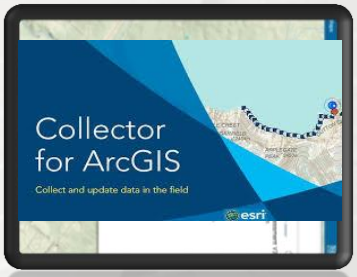
NH F&G
Aquatic Organism Passage Data

New Hampshire DOT
Department of Transportation

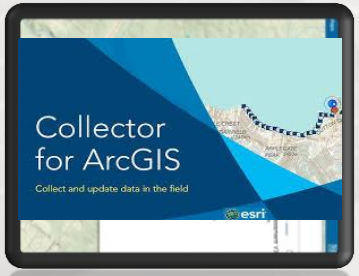
SADES

SADES Initiatives

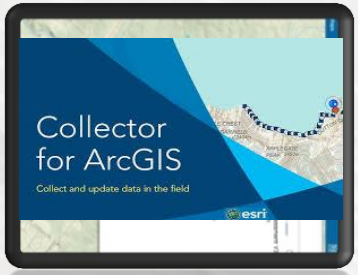
SADES Initiatives



Stream Crossing



Guardrail



ADA Ped Signals

Sidewalks

Drainage

New Hampshire DOT
Department of Transportation

SADES

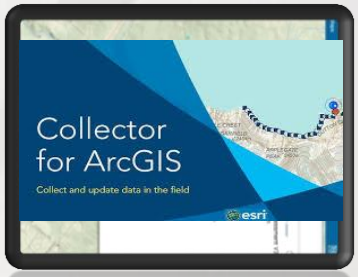
Organization Governance

Senior Management

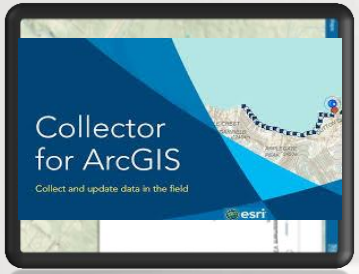
SADES Working Group

Technology Transfer Center (T2)

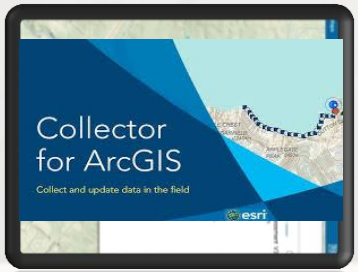
SADES Initiatives



Stream Crossing



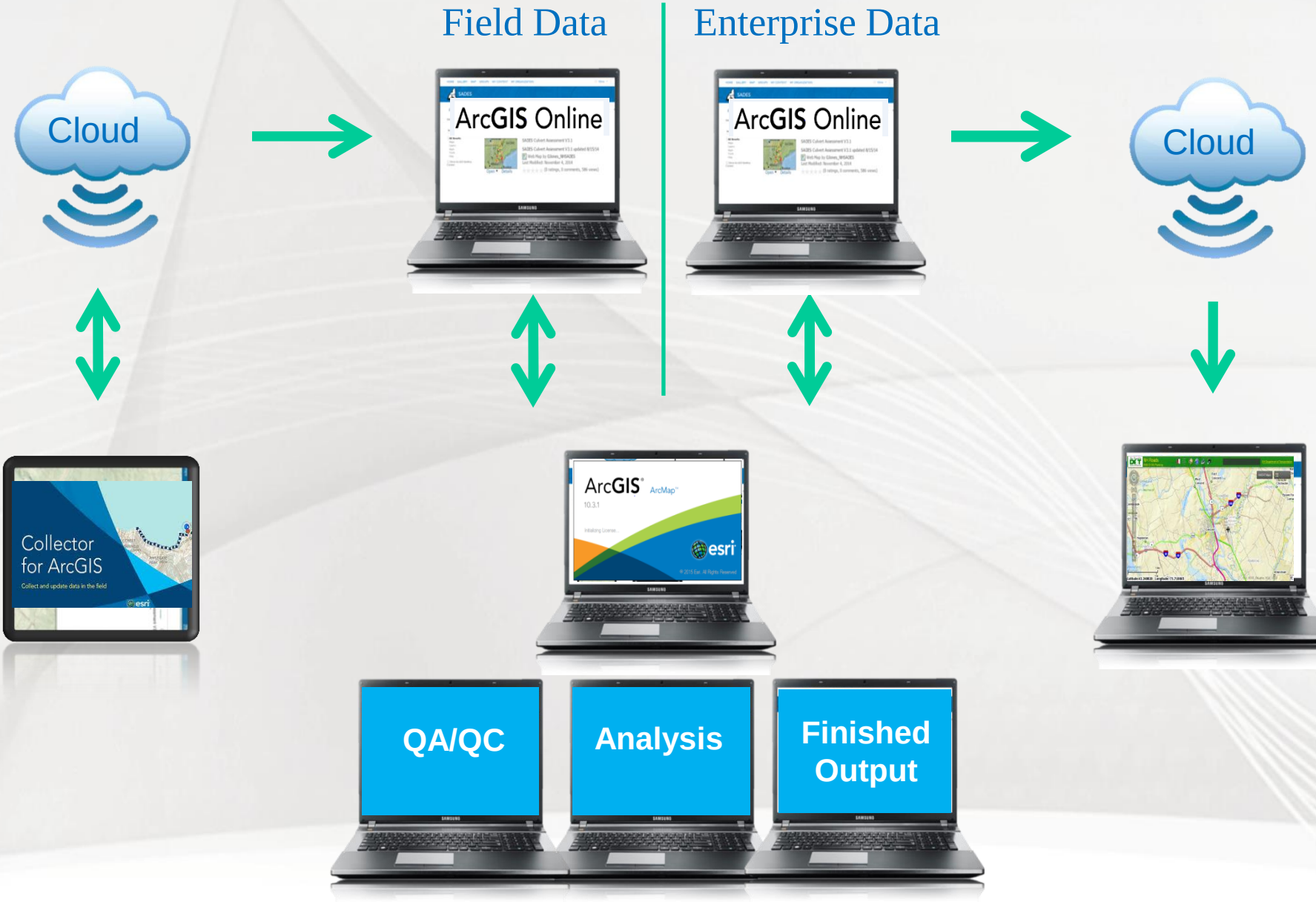
Guardrail



ADA Ped Signals

Sidewalks

New Hampshire DOT
Department of Transportation



Next Steps

New Hampshire DOT
Department of Transportation

Questions ?

New Hampshire DOT
Department of Transportation