

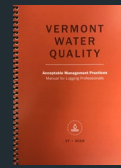
CLEAN WATER PROJECTS IN THE FOREST SECTOR

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Watershed Forester, FPR





Watershed Forestry Program



- AMP Technical Assistance
- Education and Outreach
- Logger/Forester Training
- Bridge Cost Share Program
- Bridge Rental Program
- Agency Land Clean Water Projects



ANR Lands

- 360,000 acres
- 8% of VT land base

Including

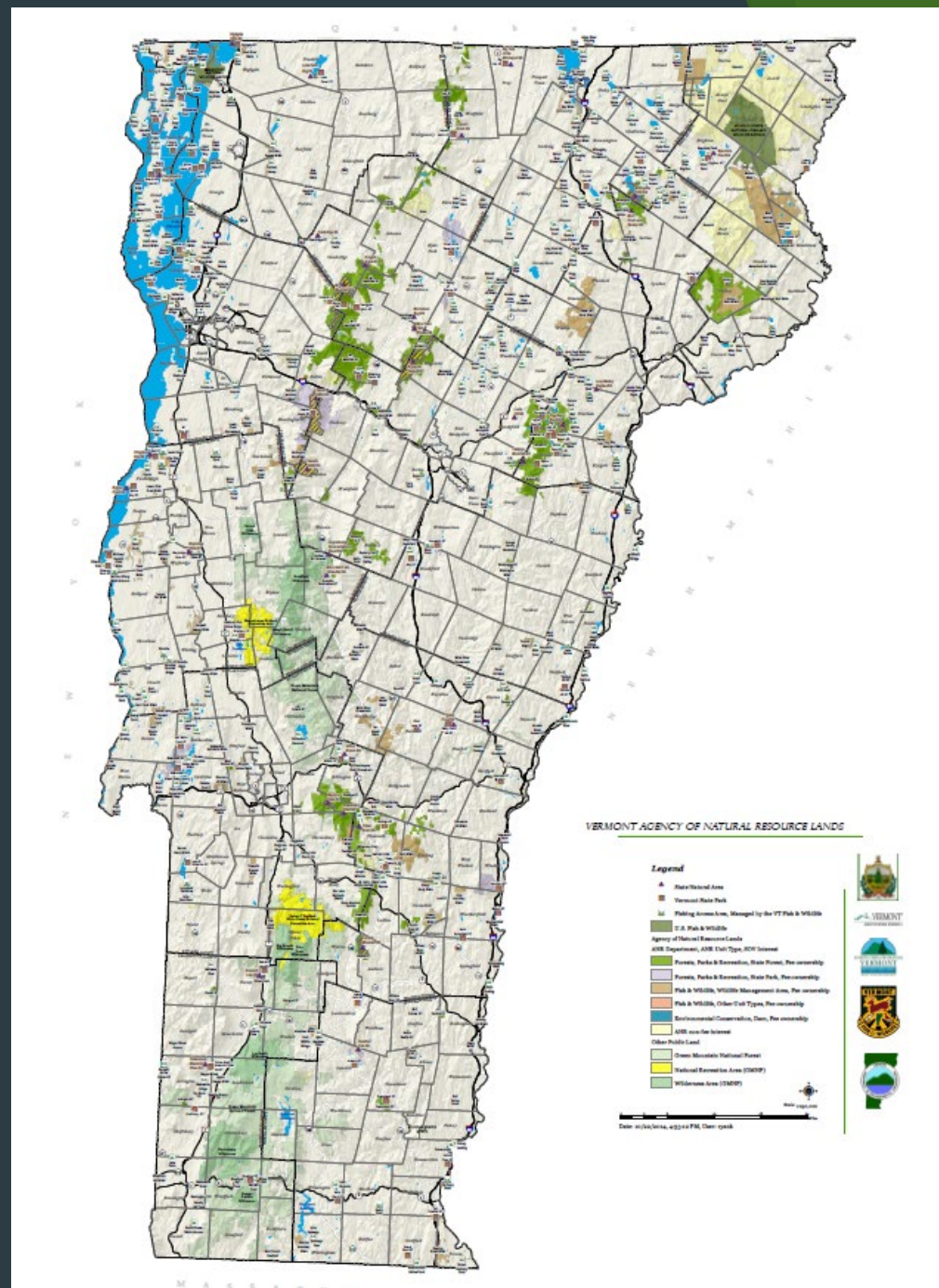
39 State Forests

55 State Parks

80 WMAs

Also, DEC Dam sites, FW Pond sites and Fishing Accesses

Approximately 980 miles
of roads and 1,500 miles of
trails



Different Road Types on ANR Lands

- ▶ **Type 1 Roads-** a road that provides recreational and management access to Vermont State Parks, developed Alpine Ski Areas and F+W fishing access areas.
 - ▶ Uses MRGP standards
- ▶ **Type 2 Roads-** gravel surface roads, wide enough and have a suitable gravel surface for a motor grader to grade. The travel lane is greater than 12 feet wide, may be crowned and sloped so water sheds off the surface into ditches or in a distributed manner, or may have a combination of practices to shed water including crowning, broad based dips, or waterbars . Type 2 roads have ditching with ditch relief culverts and permanent stream crossings to manage water outside of the roadway.
- ▶ **Type 3 Roads-** gravel surface but is not easily graded or accessed by a motor grader. The travel lane is typically 12 feet or less in width and has a combination of practices to shed water including crowning, out-slope, in-slope, broad based dips and waterbars. Type 3 roads typically have ditches with cross-drain culverts and permanent stream crossings and can range from being heavily covered in grass to grass-free.
- ▶ **Type 4 Roads-** surface consists of native material and generally utilized during frozen conditions as a winter harvest road and/or designated VAST (Vermont Association of Snow Travelers) trail. The travel lane is not graded by a motor grader and has broad based dips and waterbars to shed water from the roadway. Type 4 roads sometimes have permanent stream crossings removed, but when designated as a VAST trail, permanent crossings occur with more frequency and also has occasional ford crossings.
 - ▶ Type 2,3 and 4 roads use AMP standards

ArcGIS Road Erosion Inventory on ANR Lands

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Details Basemap

Share Print Measure Find address or place

About Content Legend

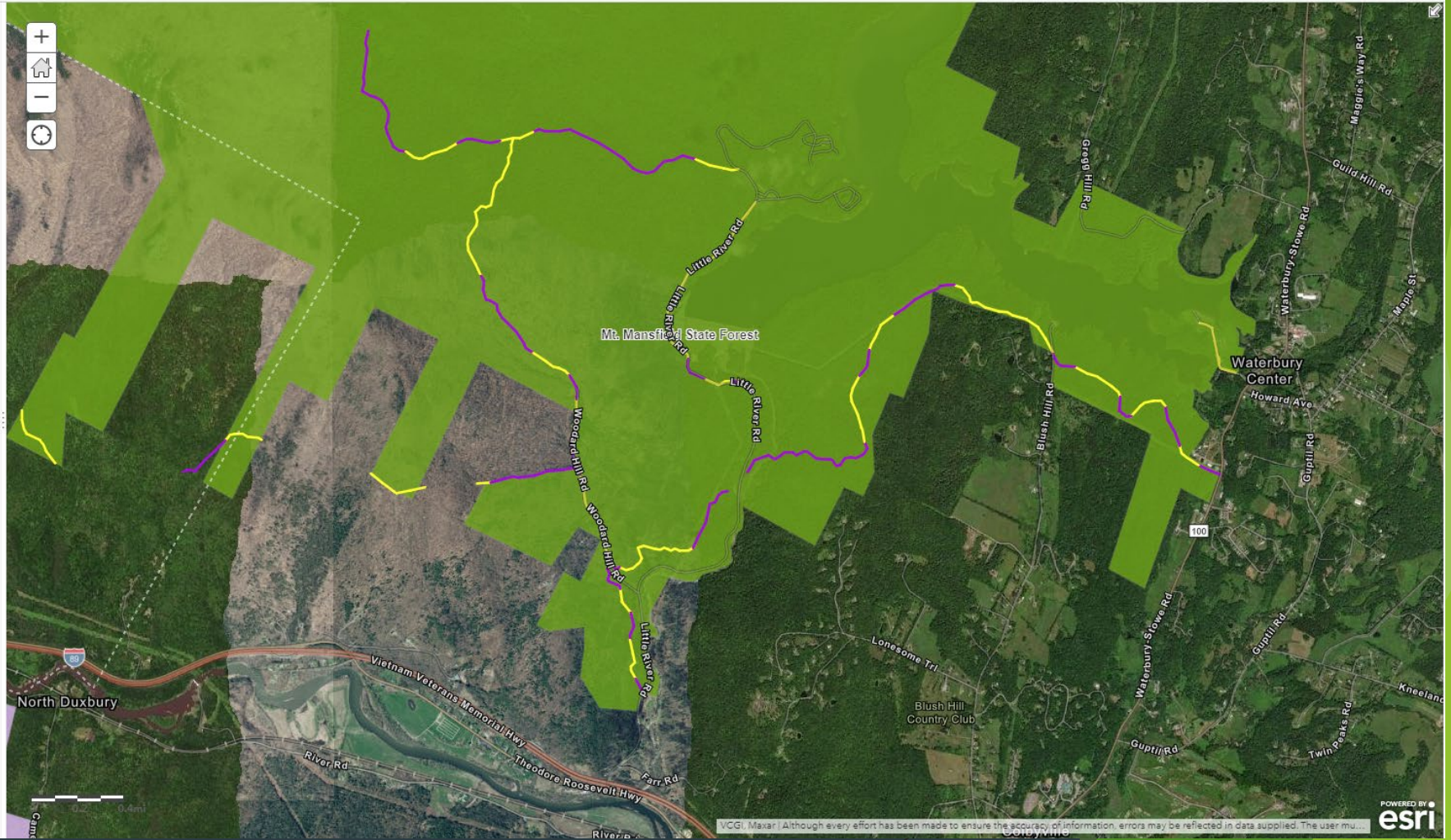
Legend

Forest Road Segments Public View

- Hydro-connected
- Not hydro-connected

ANR Land Dataset (Unit)

- State Forest
- Wildlife Management Area
- State Park



Hydrologically-Connected Road Segments

Segment length = 100 Meters

Connected Criteria:

- ▶ Within 100' of a water resource
- ▶ Bisection (crosses) and drains to a water resource
- ▶ The forest road segment is uphill from, and drains to, a segment that bisection a water of the state
- ▶ Connectivity status can be changed during the inventories

Water Resources:

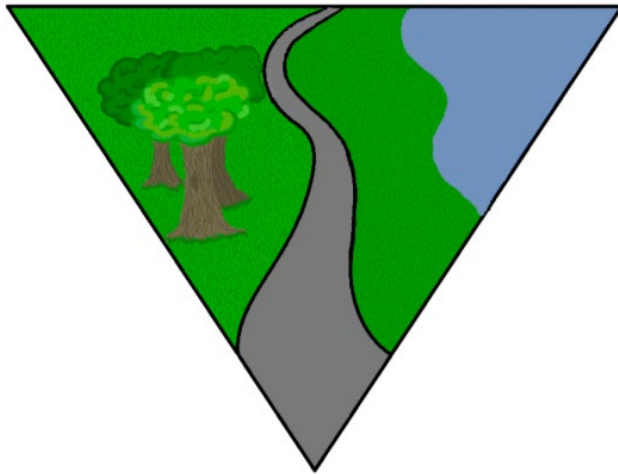
- ▶ Perennial streams
- ▶ Intermittent streams (well defined channel with obvious bed and banks, sediment transport, no permanent flow).
- ▶ Wetlands
- ▶ Lakes and Ponds

MRGP

ANR Road Erosion Inventory

Vermont Better Roads Manual

Clean Water You Can Afford



January 2019

Principal Author: Elyssa Gould



VERMONT WATER QUALITY

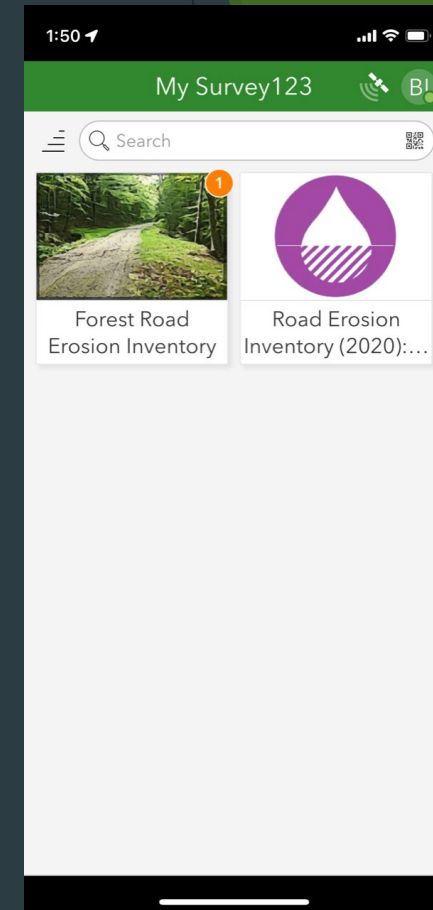
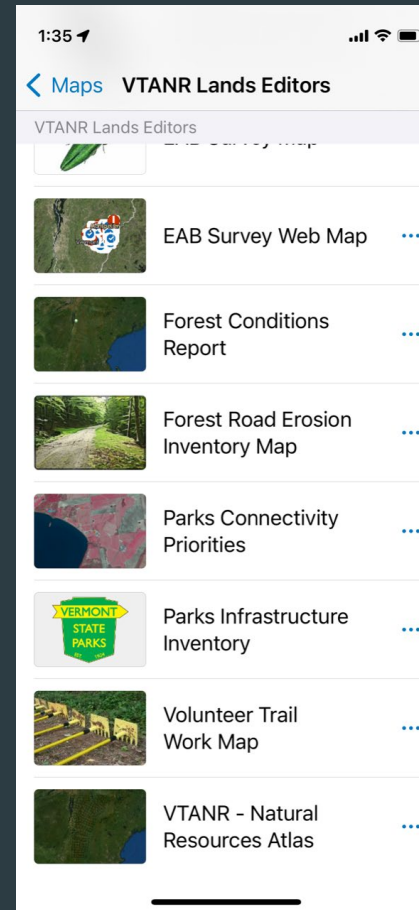
Acceptable Management Practices
Manual for Logging Professionals

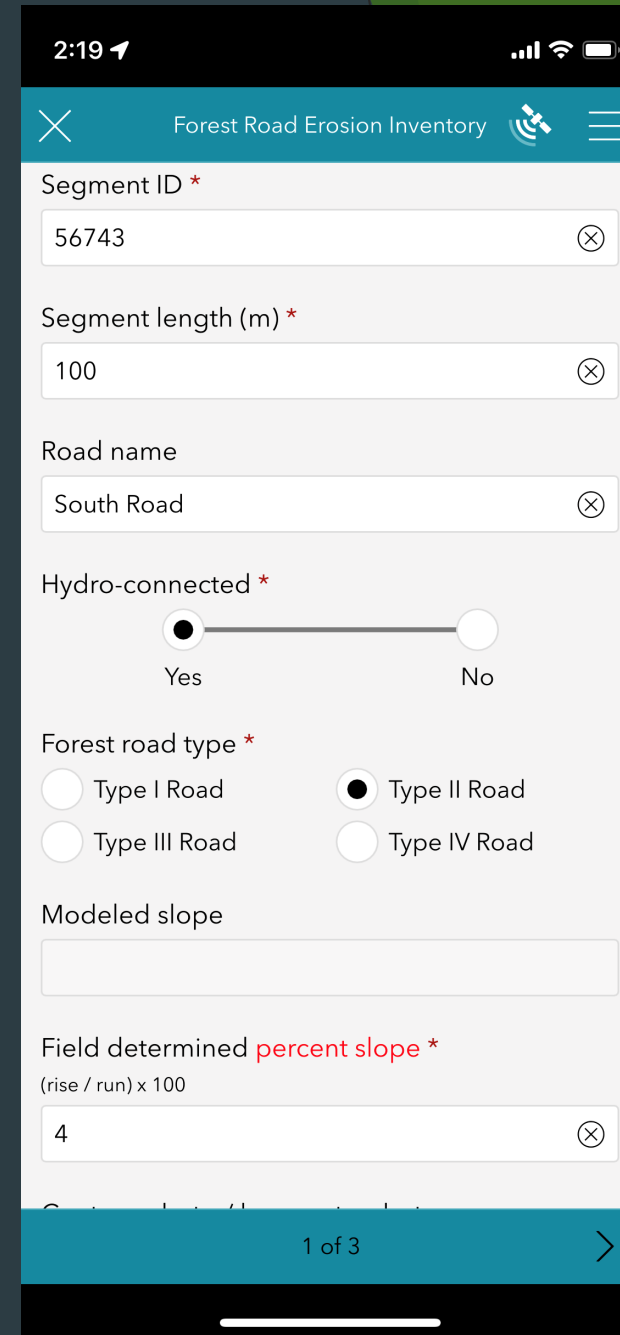
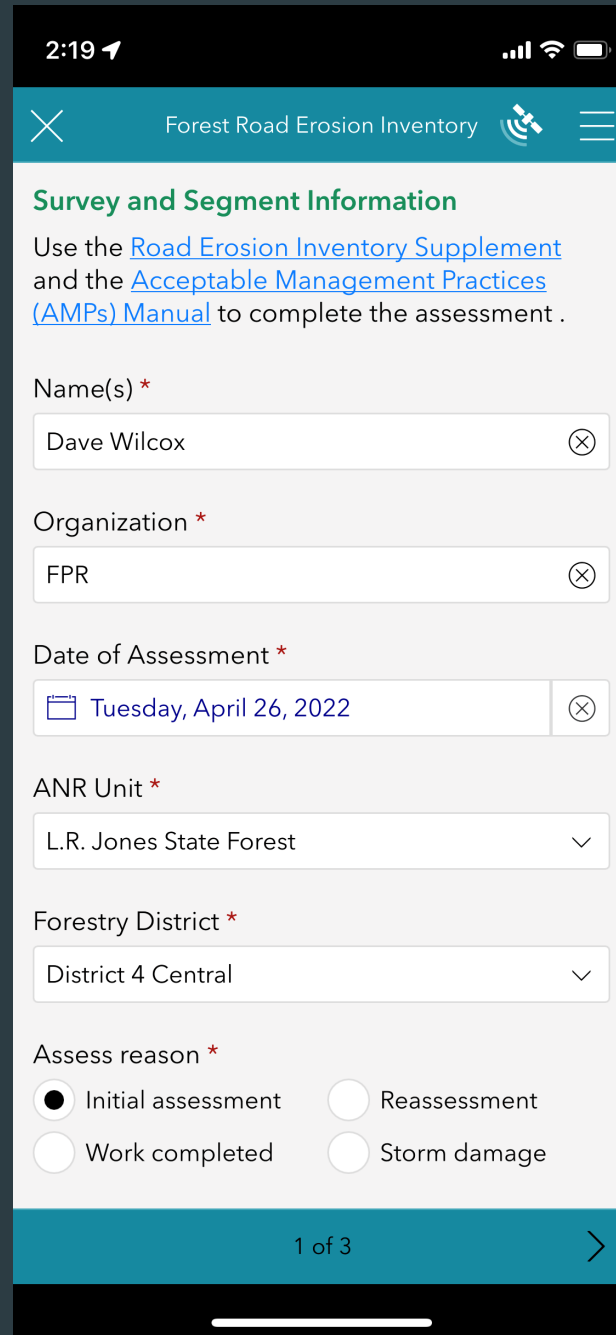
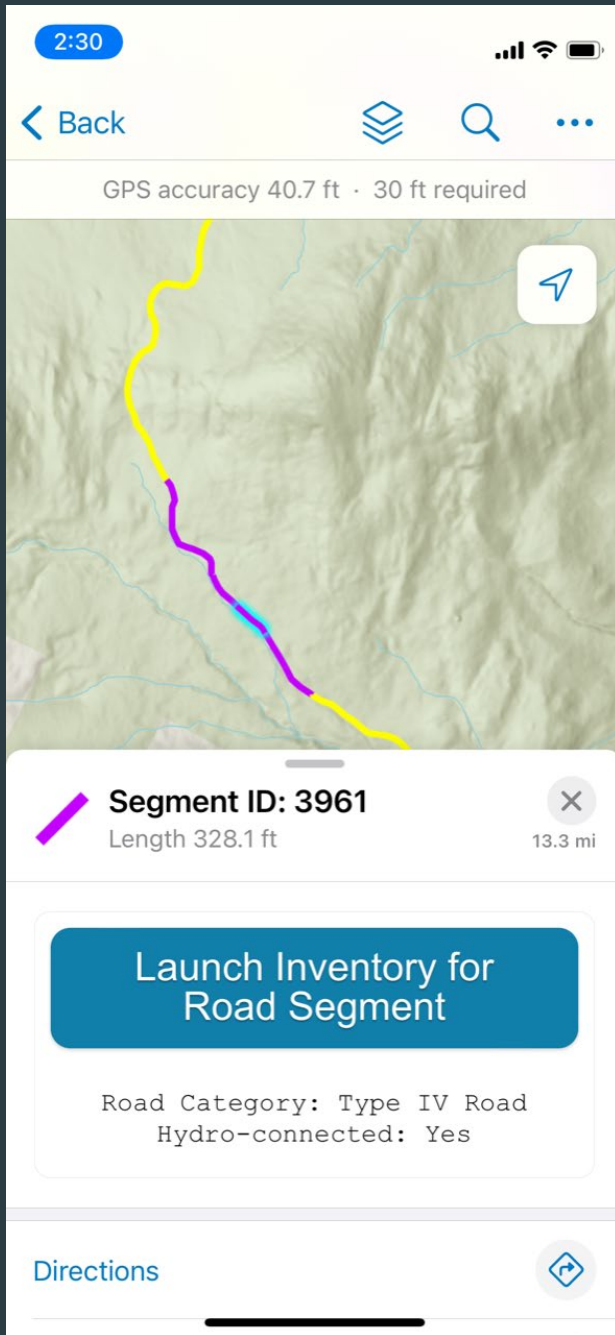


VT • 2019

ANR Road Erosion Inventory (REI)

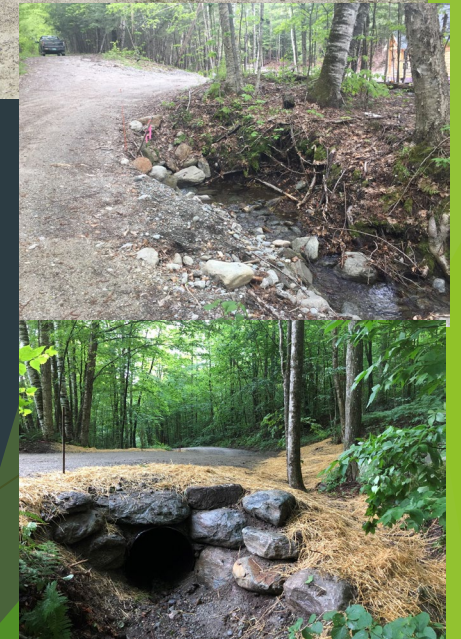
Utilizes Field Maps and Survey 123 to manage the segments and collect segment data.





Clean Water Principles

- Disconnect road Stormwater whenever possible, perpendicular flow
- Infiltrate stormwater
 - Slow it down
 - Spread it out
- Stabilize conveyances and turn out ditches or add ditch relief culverts
 - Spread water back out
- Properly size stream crossings



Ditch Relief & Disconnection

- ▶ Ditch relief culverts were installed according to AMP spacing based on road slope.



Structure Sizing

- Undersized structures were removed and replaced with structures sized according to drainage area.
- Outlets were armored and stabilized on many steep gradient intermittent streams.

Before



After



Road Surface & Shoulder Improvements

- ▶ Improvements were made to travel surface to control surface drainage & improve resiliency.
- ▶ Shoulders were re-graded to establish positive drainage.

