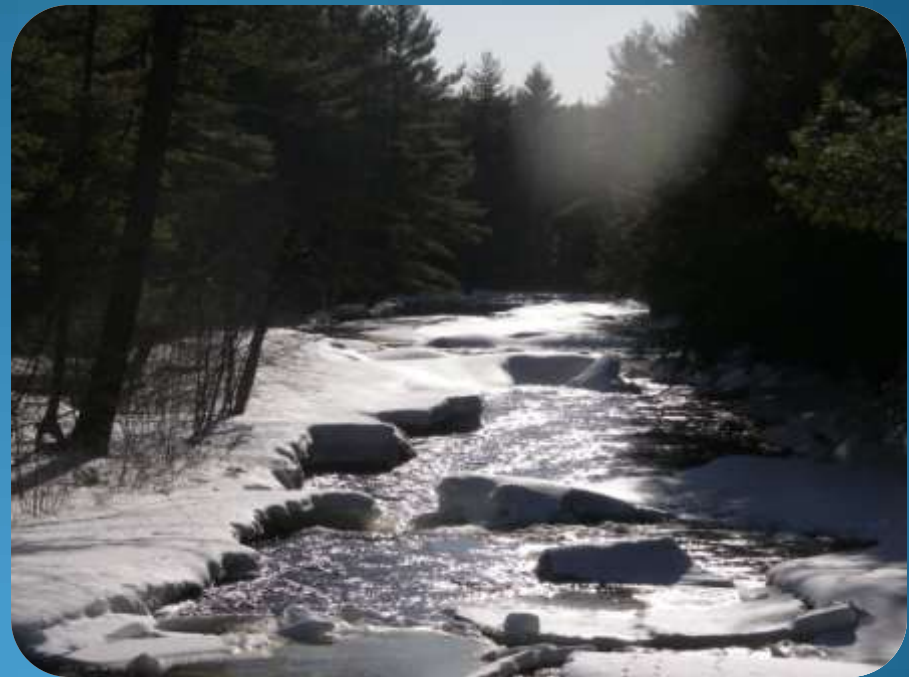


Northern Forest Watershed Incentives Project



Science at Work
for a
Sustainable World



State of the Bay
October 21, 2010

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NF Watershed Incentives Project Goals

- Restore, enhance, and protect aquatic resources in two important watersheds in Northern Forest
- Develop a replicable market-based model for transactions to protect and enhance watershed services
- Highlight and enhance the connection between upstream family forest owners and downstream water users



Project Funding

- **Conservation Innovation Grant**
 - \$500K Federal Funding
 - \$500K Project Match
 - 3-Years



Project Partners

Crooked River Watershed



John Gunn - jgunn@manomet.org



THE WESTERN
FOOTHILLS LAND TRUST

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American Forest Foundation



Todd Gartner

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Upper Connecticut River Watershed



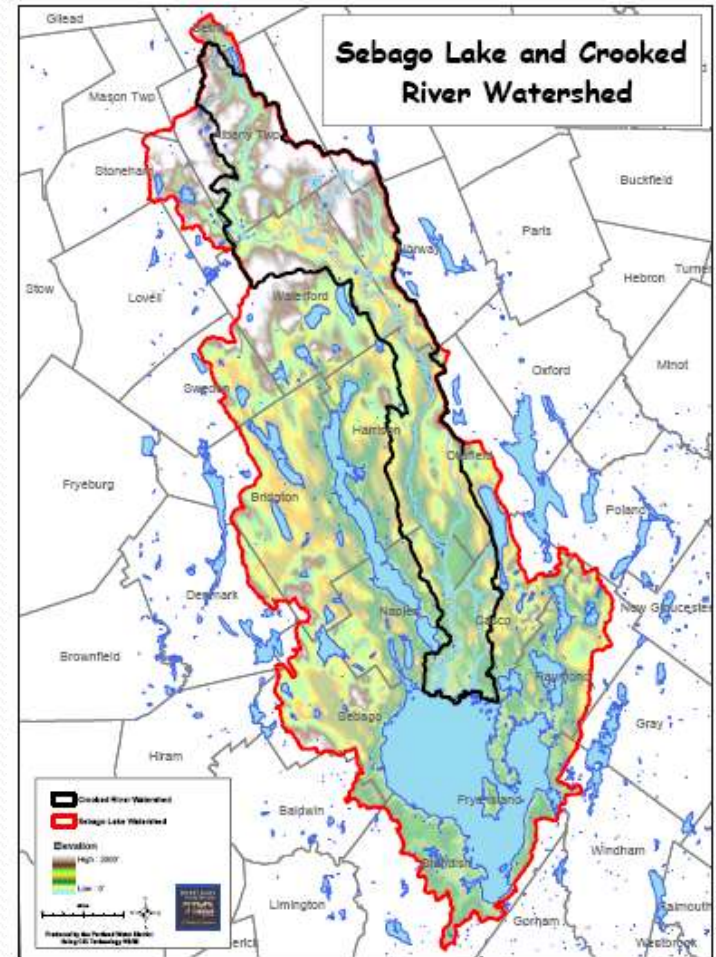
David Sleeper - dsleeper@hbresearchfoundation.org



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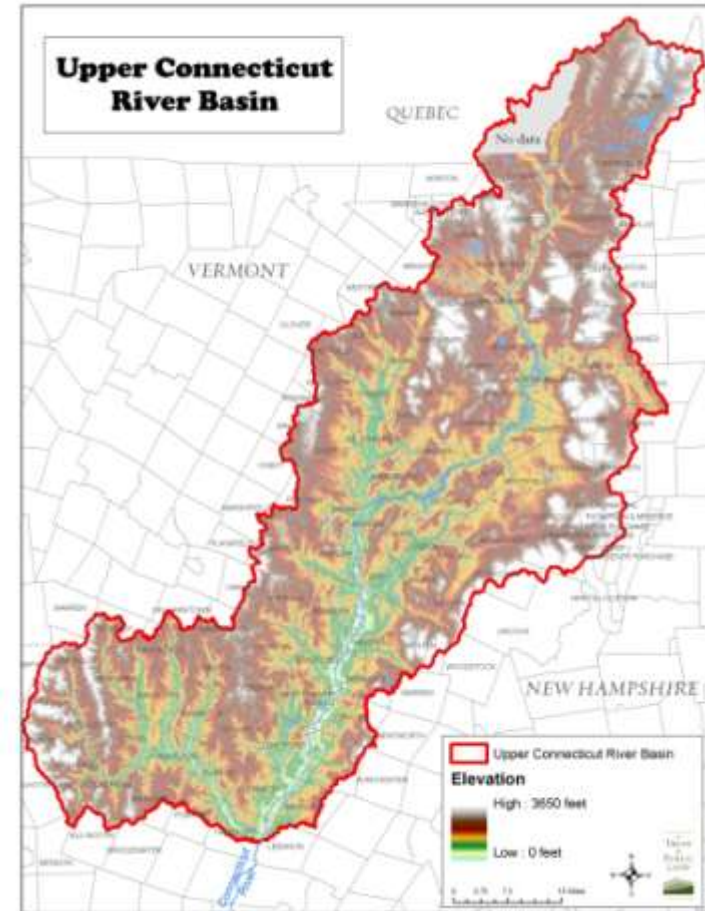
Crooked River Watershed

- Source of Portland Water District drinking water to 200,000 customers in 11 Maine communities (40% of Sebago volume)
- Basin covers approximately 275 square miles and is predominantly forested
- Priority watershed for forest conversion (*Forests, Water, and People* study)
- Sebago Lake (and Crooked River) supports indigenous populations of landlocked Atlantic salmon (*Salmo salar* sebago) and habitat for T&E species



Upper Connecticut River Watershed

- Watershed spans portions of VT and NH and comprises 16 major tributaries, 12 of which drain 100 square miles or greater
- Numerous tributary dams create reservoirs, and groundwater provides drinking water to multiple municipal water suppliers
- 32% of the Connecticut River watershed's known water-supply areas are protected
- American Heritage River, National Scenic Byway, Recreational resources
- Major salmon restoration efforts and habitat for T&E species



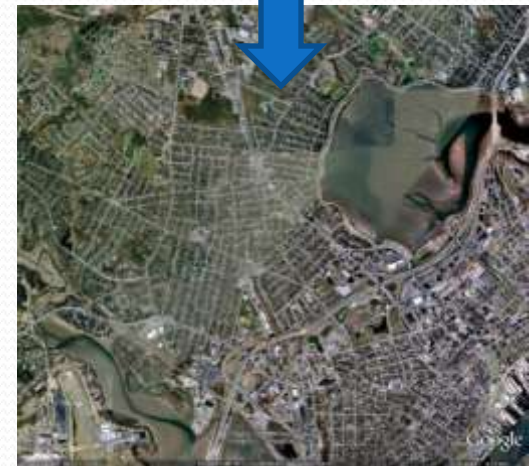
Summary of Watershed Concerns

- Forest conversion and fragmentation
- NPS water pollution from land management activities
- Pollution from aging municipal water treatment plants, septic, and storm event overflow
- Proposed dam construction
- Loss of flood plains
- Invasive species
- Loss of biodiversity
- CC impacts



Making the Case

- Defining the Threats
- Understanding Beneficiaries and Marketplace Drivers
- Practices and Incentives
- What do we get for the \$?
- Telling the Story



Beneficiaries

- Need to know:
 - Who uses the water
 - How they use it
 - How they benefit from “clean” water
 - How they fit into a broadly-defined market framework



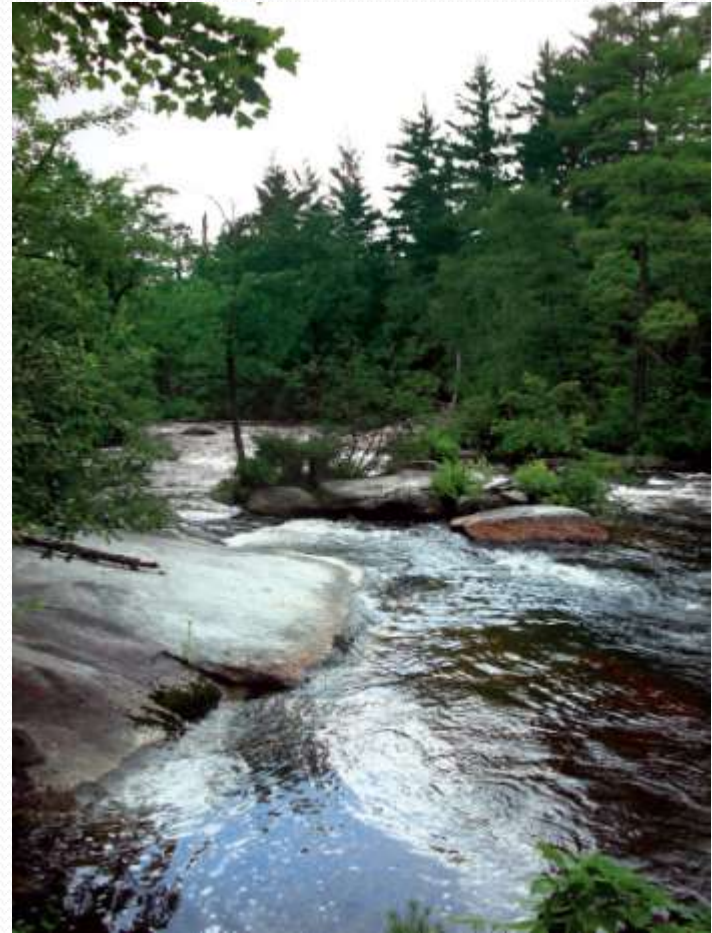
First PMBus System Power Management and Protection IC



- Improves reliability
- Reduces power consumption

Demand Drivers

- VT Law School Land Use Institute:
 - Regulatory Driver Review for VT, NH, ME
- Case Studies
 - VT LUI
 - Yale FES (Drinking Water)

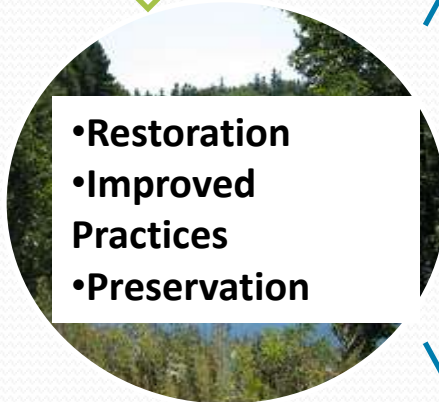


Vision of a Watershed Services Marketplace

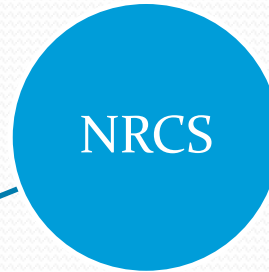
Sellers



Products

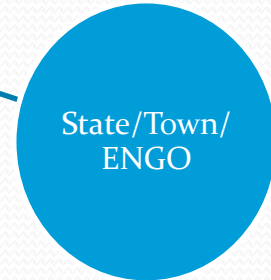


- Water District/Utility
- Rate Payers, Comm. Users
- Stewardship Incentive Fund
- Recreation
- Industry



- EQIP
- Dedicated Pool

**Buyers/
\$ Sources**



- Current Use Tax
- Zoning/TDR
- Easements



- In-Lieu Fee Compensation Program (ME DEP/TNC)



What can we do? Example Practices

Riparian Buffer

- Increase width beyond statutory minimums
- Increase forest cover within buffer

Culverts and Drainage Improvements

- Resize culvert
- Rehabilitate drainage and vegetative buffers

Vegetative Cover

- Forest cover replaces agriculture or other land cover

Road Retirement

- Discontinue non-essential forest or agricultural roads

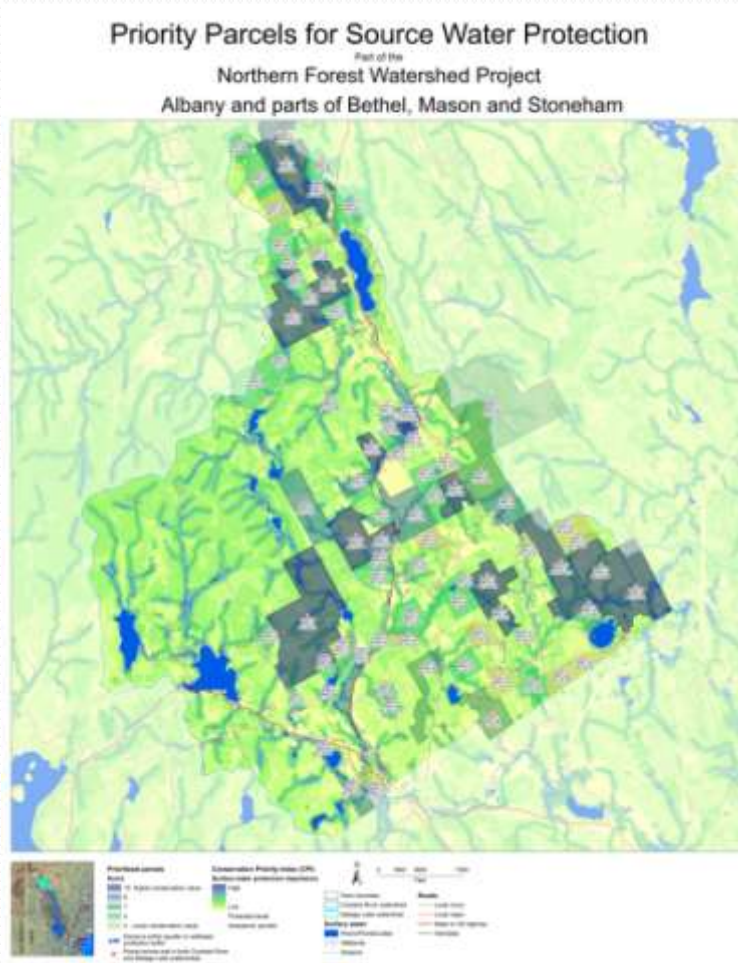
Silvicultural Practices

- Higher retention
- Low-impact equipment (reduce rutting)

Road Network

- Upgrade road network
- Permanent bridges

Where should we focus our \$ and effort?



- GIS Threats Assessment: Paul Barten, Bill VanDoren, UMass
- estimates of water quality changes associated with forest conversion and other land use impacts
- Conservation Priority Index - prioritization of parcels

Conservation Priority Index

| | | ← Increasing importance → Decreasing importance | | | | |
|-----------------------------------|---|---|----------------|--------------------|---------------|---|
| | | 3 | 2 | 1 | 0 | |
| Landscape characteristic | Why is it important? | | | | | |
| Land use | In the northeast, forest provides the best source water quality | Forest/wetland | — | — | All others | |
| Distance to streams (feet) | Vegetated, and especially, forested riparian buffers are a “last chance” to absorb nutrients and trap sediment; | 0-100 | 100-200 | 200-300 | > 300 | |
| Distance to ponds/wetlands (feet) | forested riparian areas also provide key organic and structural inputs | 0-100 | 100-200 | 200-300 | > 300 | |
| Soils (1/2 weight) | Depth to water table | Removing forest cover can increase soil water, increasing the likelihood of overland flow. | shallow | moderate | deep | — |
| | Permeability | Soils through which water infiltrates slowly readily exhibit overland flow, which decreases water quality | poorly drained | moderate | well drained | — |
| | Slope | Steep slopes are more at risk for erosion when deep-rooted trees that anchor soil are removed | steep (> 15%) | moderate (5 – 15%) | gentle (< 5%) | — |
| Water – Forest – Roads | Roads are a source of sediment, and a forested buffer can mitigate sediment and pollutants | yes | no | no | no | |

Where We're Going



- Develop (or enhance) Infrastructure for Direct Payments/Cost Share for Practices
- Gray vs. Green Infrastructure analysis
- Conservation Easements (evaluate vs. direct payments)
- Leveraging other ES Revenue Streams (e.g., carbon \$ for riparian restoration)
- Demonstrate
- Outreach and Education – connecting people, forests, and water

Fundamental Challenges

- **Making the Case When Most Beneficiaries Don't Know There is a Problem (or soon will be)**
- **Communicating the Complexities to BOTH the Buyers and Sellers**
- **Assuring that we get what we pay for, and can keep it**
- **Creating Self-sustaining Systems (that can last until we get to Capitalism 3.0)**

