

Tools and resources for protecting the stream in your community

Part I: Watershed and stream basics – definitions and function

Hudson River
Watershed Alliance

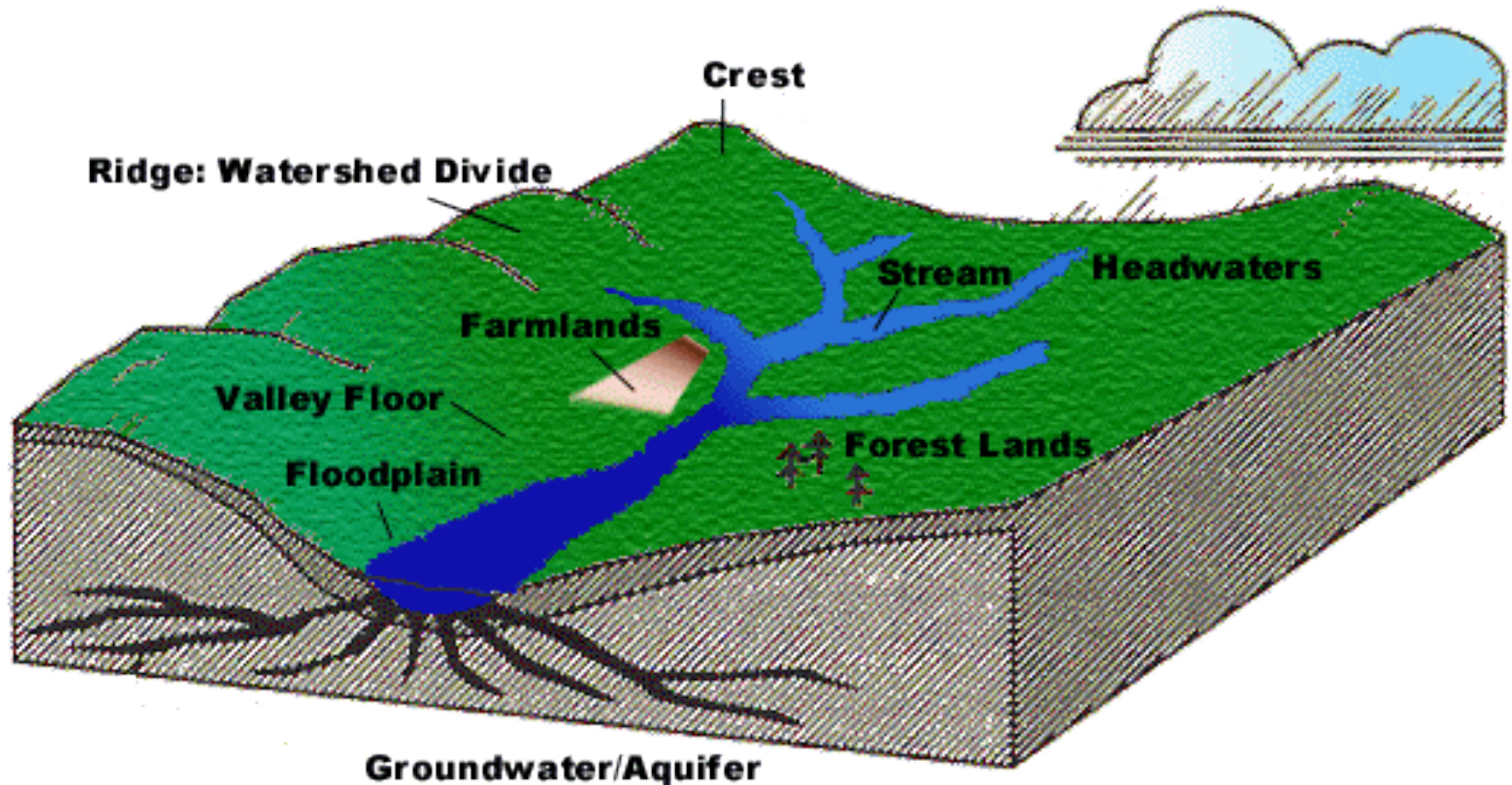


Maureen Cunningham
Hudson River Watershed Alliance

This Project has been funded in part by a grant from the New York State Environmental Protection Fund through the New York Department of Environmental Conservation.

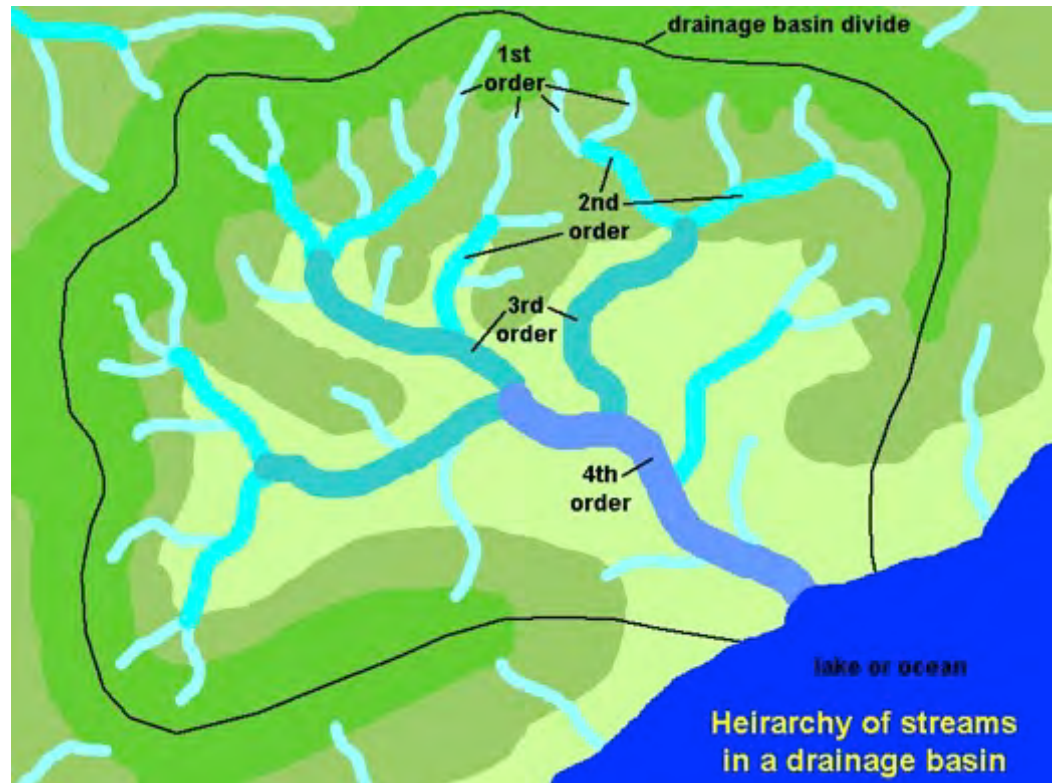
Watershed

land area draining into a river, river system or other body of water



Hierarchy of streams

- **Headwaters** are smallest streams, farthest away from the mouth, serve as sources of stream
- **First order streams** are smallest streams which flow into **second order streams**, etc.
- **Seventh order streams** and higher are considered **rivers**



Stream flows

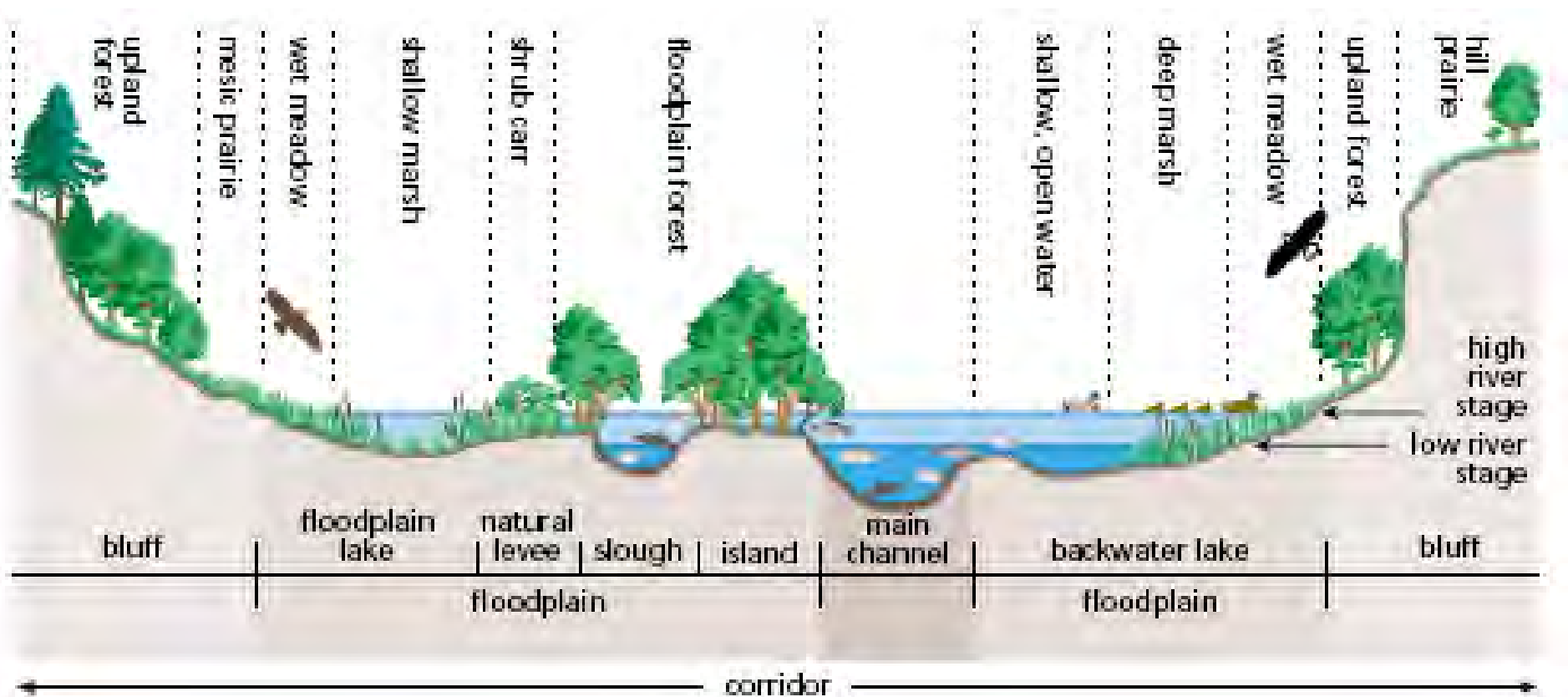
- **Perennial** - year-round, continuous flow
- **Intermittent/seasonal** – only at certain times of the year from springs or melting snow
- **Ephemeral** – flowing in direct response to rain events, channels at all times above water table



Witch's Brook at Lewis Woods, 2011 (S. Gruber)

Stream/riparian corridor

includes various types of wetlands, floodplains, and upland buffers



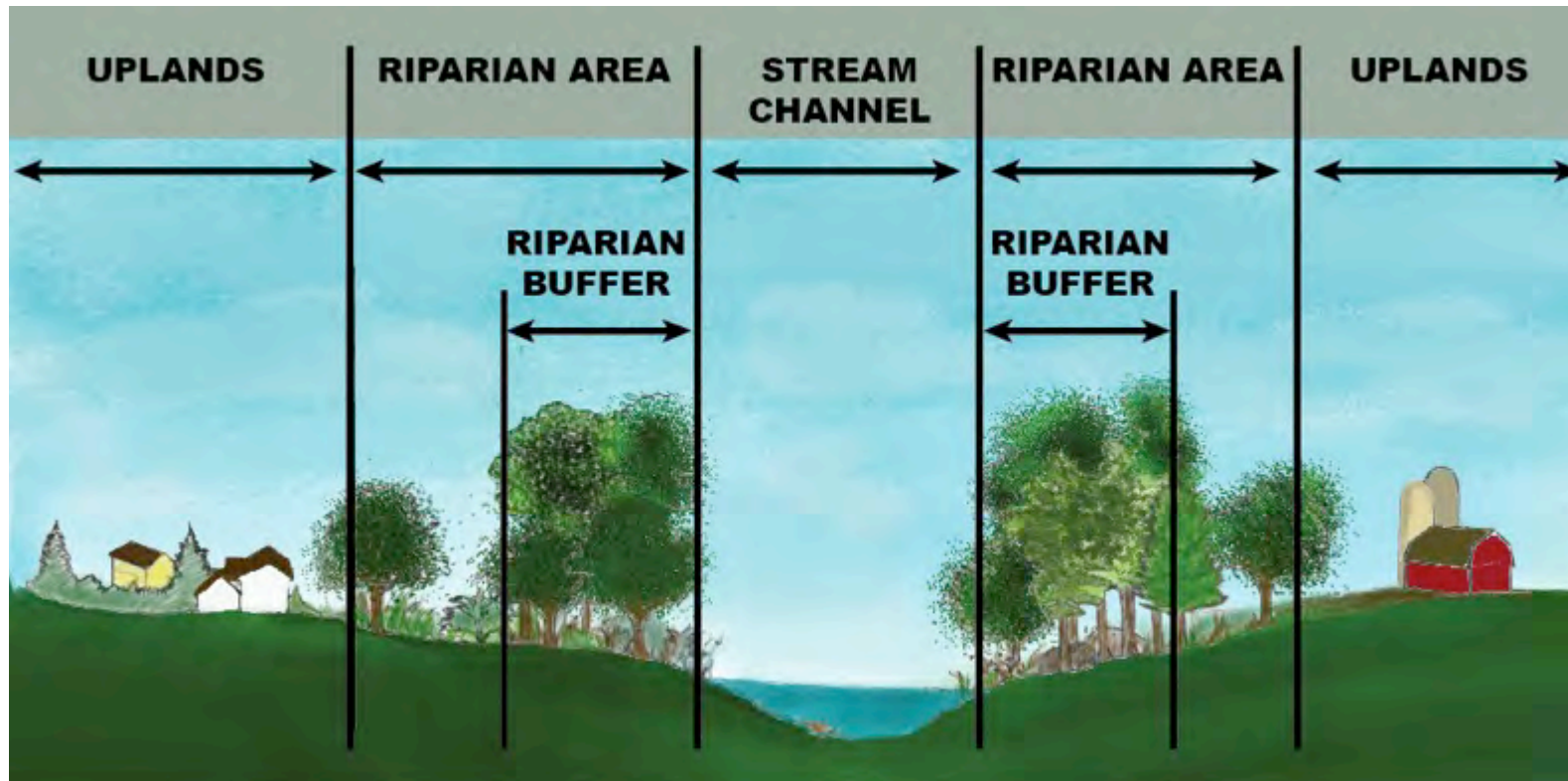
Source: Stream Corridor Restoration: Principles, Processes, and Practices, 10/98, by the Federal Interagency Stream Restoration Working Group (FISRWG).

Stream bed or channel

water flowing through streams and the land beneath them

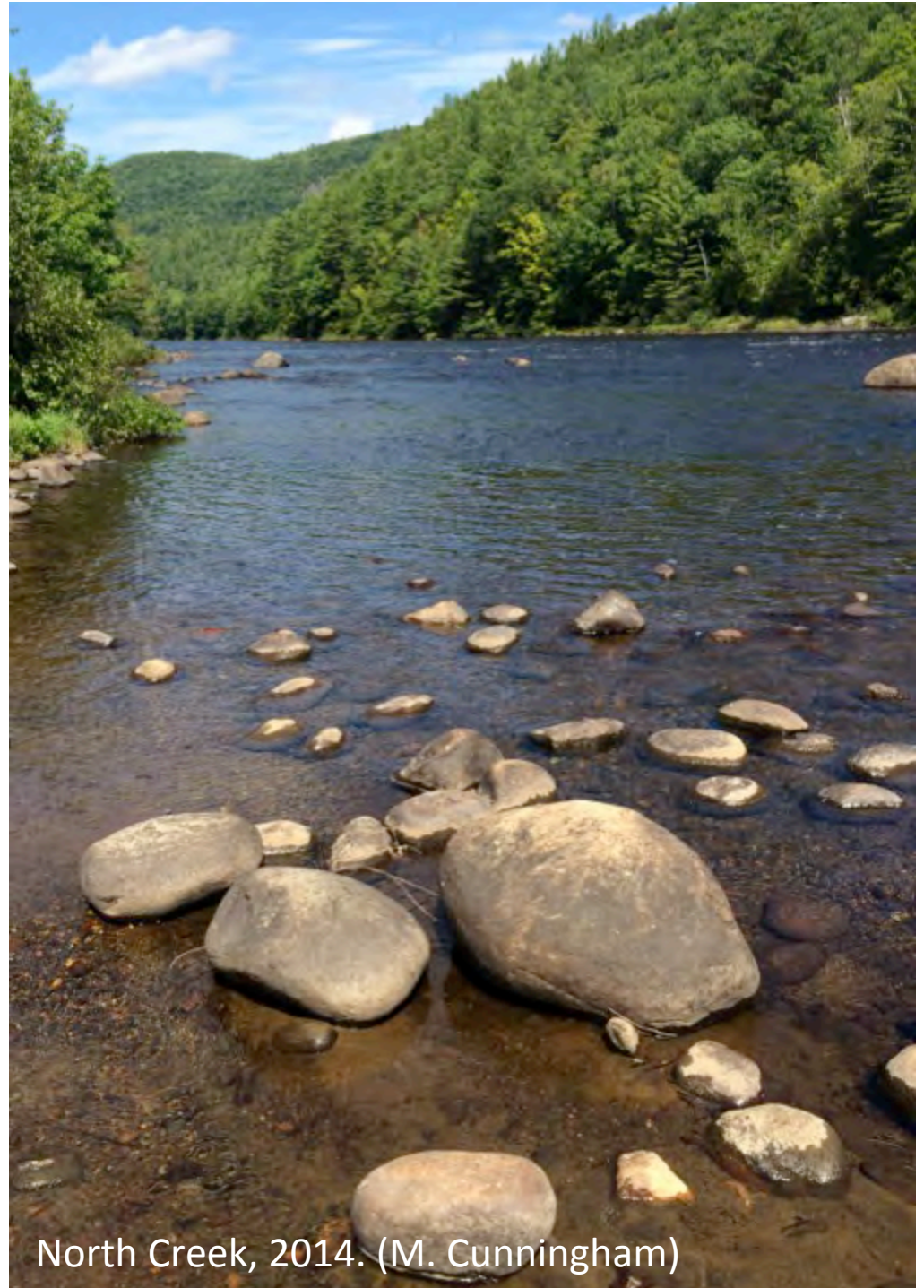
Stream or riparian buffer

a strip of natural vegetation along the banks of a stream that separates the stream from developed areas



Why are buffers so important?

- Stabilize stream banks
- Reduce erosion
- Reduce flooding damage
- Filter pollutants, e.g. nitrogen, pesticides
- Filter overland sediments
- Provide shade/regulate water temperature
- Support wildlife habitat



North Creek, 2014. (M. Cunningham)

Benefits from buffer widths

Buffer width	Benefit
80 feet	Nutrient/pollutant removal
100-200 feet	Water resource protection, core aquatic habitat
100 feet	Temperature regulation
100 feet	Vernal pool habitat
160 feet	Bank stabilization
250 feet	Salamander core habitat and buffer
250-575 feet	Bird habitat for 90% of birds (adjacent uplands)
330 feet	Water quality and minimal wildlife protection (adjacent uplands)
465-950 feet	Core riparian habitat for reptiles and amphibians (adjacent uplands)
535 feet	Long-term health of ecosystem (adjacent uplands)
750 feet	Terrestrial habitat for vernal pool breeding species (adjacent uplands)

Source: Compilation of current literature in *Conserving Natural Areas and Wildlife in Your Community*, NYS DEC, 2008.

Buffer widths

At least **100 feet wide buffers** are needed to protect water quality, habitat and and biotic features:

- Significant nitrogen removal
- Measurable temperature increases avoided
- In-stream habitat maintained at natural state
- 85% of sediments from overland flow removed, including more of the finer silts and clays



Source: Sweeney and Newbold, 2014. *Streamside Buffer Width Needed to Protect Stream Water Quality, Habitat and Organisms: A Literature Review.*

DEC stream classifications

NYS waterbodies receive a class and designation based on the “existing or expected best usage”

AA or A = source for drinking water

B = contact recreation, such as swimming (but not for drinking)

C = supporting fisheries and non-contact activities

D = lowest standard

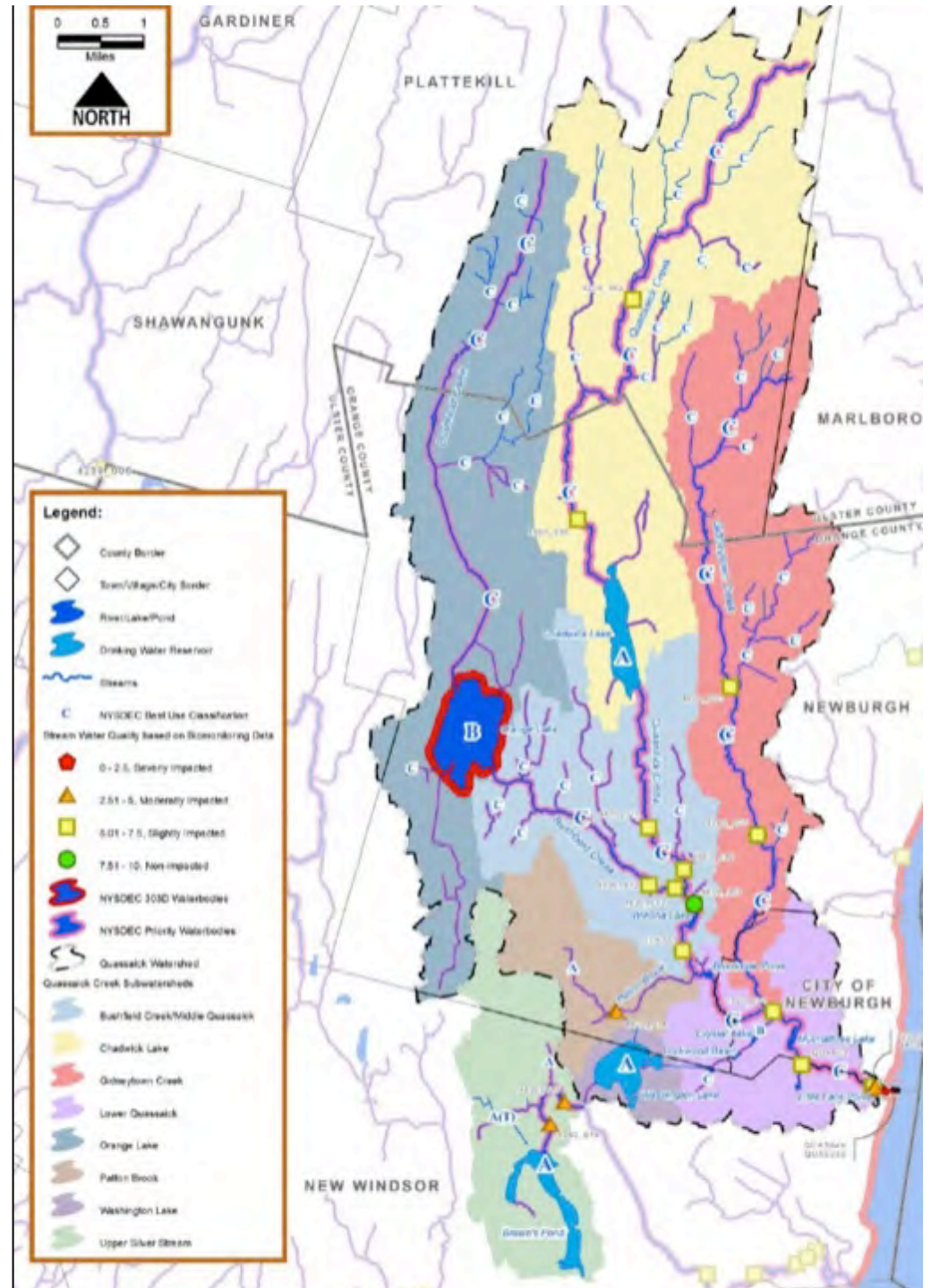
(T) = supports a trout population

(TS) = supports trout spawning

Quassaick Creek Stream Classifications

- Streams in Quassaick Creek are mostly Class C
- Washington and Chadwick Lakes and Brown's Pond (drinking water sources) are Class A

Source: Quassaick Creek Watershed Management Plan, 2014.



NYS DEC Waterbody Inventory and Priority Waterbodies List (WI/PWL)

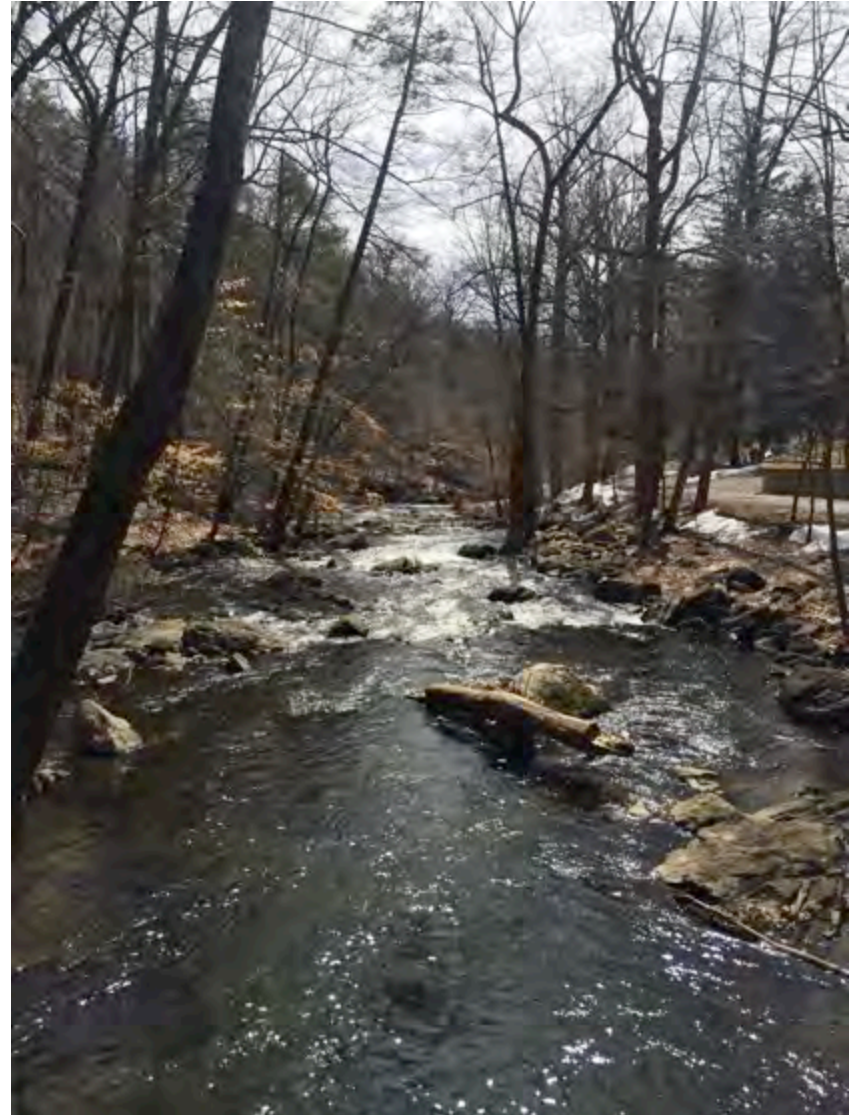
- **Statewide inventory of NYS waters** that the DEC uses to record current water quality information, characterize known or suspected water quality problems and track progress toward their resolution
- **Assessment categories:** impaired waters, waters with minor impacts, threatened waterbodies, waterbodies with impacts needing verification, waterbodies with no known impacts, unassessed waterbodies

Regulations for protecting water quality and streams

- **Federal Clean Water Act** regulates **wastewater and stormwater discharges** to streams; in NY State, **SPDES regulations** for wastewater and general permits for stormwater
- **NYS Protection of Waters regulations** require permits for disturbing the “bed and banks” of protected streams

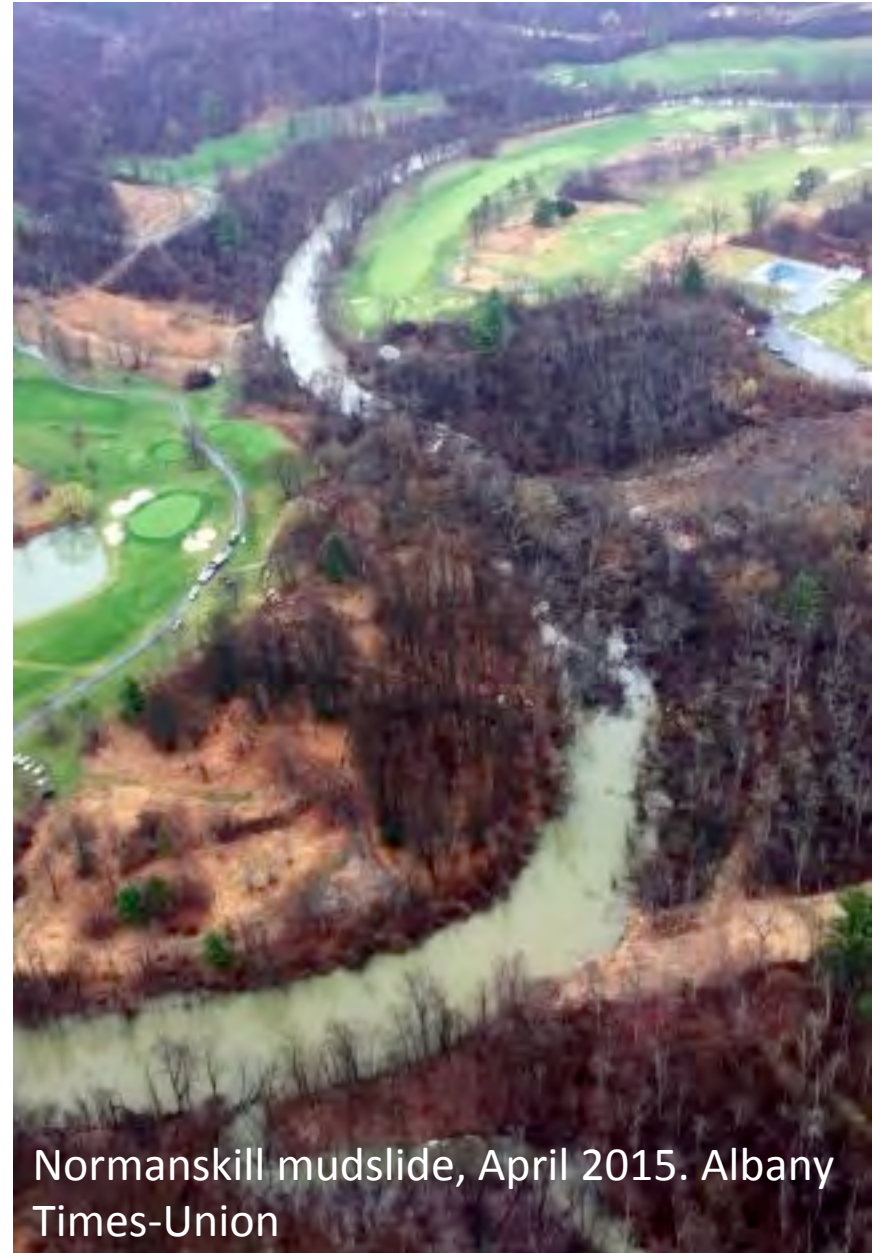
If you plan to do work in or near a NYS stream, chances are you may need a permit....

- US Army Corps of Engineers
- NYS DEC
 - Protection of Waters Permits
 - Freshwater Wetlands Permits
 - Tidal Wetlands Permits
 - Water Quality Certification
 - Stormwater Permit for Construction
- County/Municipal



Potential risks to stream health

- **Human Activity/ Development:** Industry, Agriculture, Urbanization, Land use patterns, Percentage of impervious surface cover
- **Point Source Pollution (discharges)**
- **Non Point Source Pollution (runoff)** – sediments, nutrients, pathogens, toxins, debris



Normanskill mudslide, April 2015. Albany Times-Union

Watershed and stream protection tools

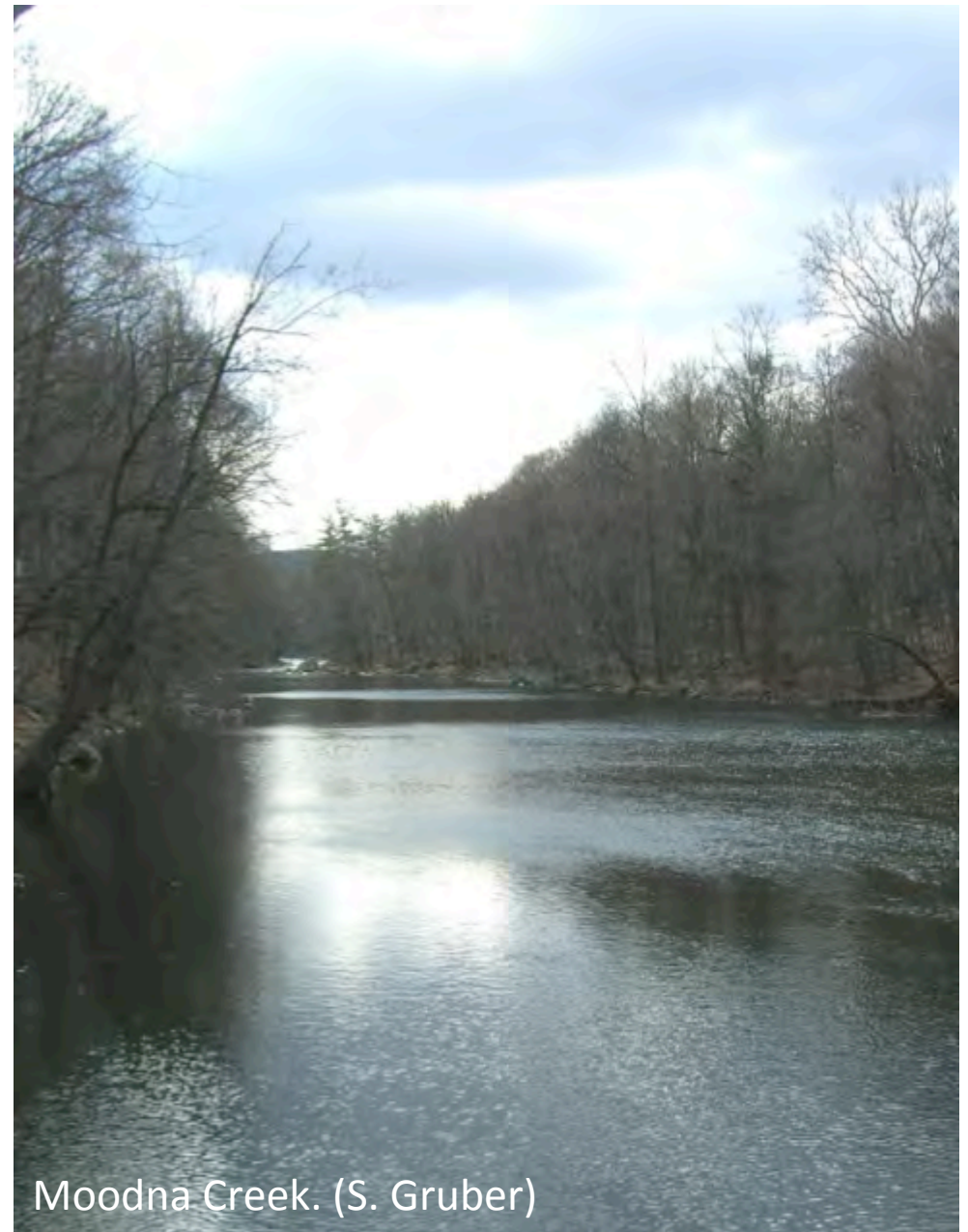
- Stream buffer protection
- Shoreline stabilization
- Dam and barrier removal
- Fish and eel ladders
- Water quality monitoring
- Daylighting
- Stormwater management
- Septic maintenance
- Watershed planning
- Watershed mapping



Wappinger Creek Watershed Intermunicipal Council and Trout Unlimited volunteers measuring flow in Hunns Lake Creek. (Credit: CCEDC)

Watershed and stream resources

- NYS DEC Hudson River Estuary Program, Trees for Tribs
- NYS DEC Division of Water
- USGS HUC watershed delineations
- Center for Watershed Protection
- US EPA Watershed Academy
- Hudson Estuary Watershed Resiliency Project
- Hudson River Watershed Alliance, Watershed Groups - Watershed Management Plans, Intermunicipal Agreements
- Counties/Soil & Water Conservation Districts
- Municipalities/Open Space Plans



June 8, 2015, 9:30 am
Black Rock Forest
Developing Sustainable Tributary
Strategies Workshop II

Part II:
Tools for protecting riparian buffers through
conservation easements and intermunicipal
agreements