Intermunicipal Watershed Planning for the Onesquethaw-Coeymans Creek located in southern Albany County
Presented to the Local Government Workshop
April 8, 2010

This presentation is based in part on material prepared with funding grants from the New York State Environmental Protection Fund through the Hudson River Estuary Program.

Prepared by Roy Lamberton, grant coordinator, Onesquethaw-Coeymans Watershed Council

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Thank you for allowing us to make this presentation about municipal involvement in watershed planning.

My name is Roy Lamberton and I represent the Onesquethaw-Coeymans Watershed Council.

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Presentation Made by the
Onesquethaw-Coeymans Watershed Council
(OCWC)

A private not-for-profit organization incorporated in 2000. Its mission is to protect and preserve the quality of the Onesquethaw-Coeymans creek and its watershed for the benefit of people, wildlife, and the environment.

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Clarksville Falls

The OCWC is leading an effort to develop a Watershed Management Plan.

This presentation describes the details of this effort.

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Onesquethaw–Coeymans Watershed Council (OCWC)

Beginnings

- Individuals with an interest in the stream began meeting in 1997.
- Meetings included members of Trout Unlimited (TU), Audubon Society of New York (ASNY), and community special interest groups.

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In 2000, the OCWC incorporated as a not-for-profit corporation

Upper Clarksville Gorge

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Onesquethaw–Coeymans Watershed Council

Beginnings

- Through word of mouth, others became interested:
- The Mohawk Hudson Land Conservancy began attending;
- College students from SUNY Albany and SUNY Cortland helped gather data.

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Tributary from Lawson Lake has traveled through Onesquethaw Cave

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OCWC
Founding Organizations

- Albany County Water Quality Coordinating Committee
- Audubon Society of New York State
- Mohawk Hudson Land Conservancy
- Trout Unlimited (Clearwater Chapter**)**
- *The founding organizations recognized the special features of the watershed, and their value to the community.*

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Aerial view of the OC confluence with the Hudson River and sediment deposits

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Hudson River Estuary Program (HREP)

In 2006, the OCWC obtained a grant from DEC's HREP to study the watershed and develop a Watershed Management Plan.

The mission of the HREP is to:

- Conserve the Natural Resources of the Hudson River
- Promote public use and enjoyment
- Clean up pollution

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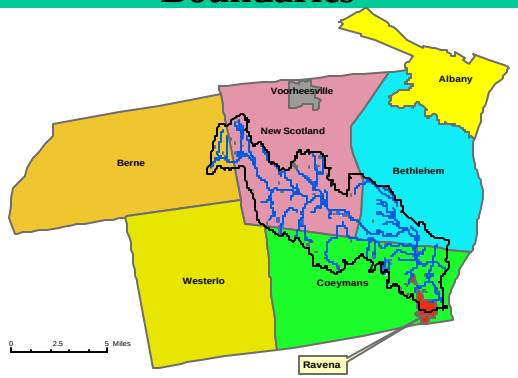
Watersheds Cross Municipal Boundaries



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The OC Watershed

- The watershed drains 52 square miles;
- The Creek travels about 19 miles from the Helderbergs to the Hudson, dropping 1400 feet;
- **The watershed includes**:
- Parts of the Towns of Berne, New Scotland, Bethlehem, and Coeymans;
- The hamlets of Clarksville, Coeymans, South Bethlehem, Feura Bush, Selkirk, and the Village of Ravena;
- 25 properties on the National Register and several parks and preserves.

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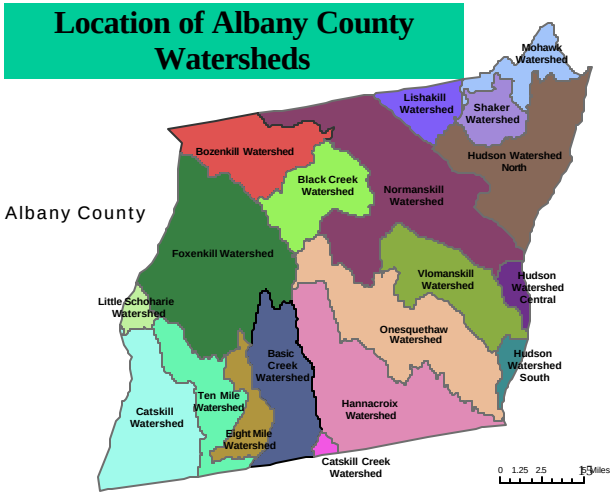
Location of Albany County Watersheds



Albany County Watersheds

- There are 15 major watersheds in Albany County;
- The OC Watershed drains roughly the center of the county in a southeast flow.
- *A watershed is the land area that drains into a body of water.*

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What is a Watershed Management Plan ?

- A Watershed Management Plan is simply a guidance document, prepared with the help of stakeholders.
- Developing and implementing an effective Watershed Management Plan requires intermunicipal communication and cooperation.

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The Watershed Management Plan

A guide to help the Council, residents, industry, and municipalities work together to promote the protection and improvement of water quality and stewardship of the watershed.

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Creating the Watershed Management Plan

- Accumulate factual information (the "Study" or "Assessment") about the watershed;
- Present the information to stakeholders;
- Obtain stakeholder opinion and input;
- Use this input to craft the Watershed Management Plan.

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Site of significant erosion

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The Watershed Study
the first step

- The Study was completed in May 2008 through a partnership of the Capital District Regional Planning Commission and volunteers from the Onesquethaw-Coeymans Watershed Council

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THE ONESQUETHAW-COEYMANS WATERSHED STUDY

Prepared by the Capital District Regional Planning Commission and The Onesquethaw-Coeymans Watershed Council

May 2008

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The Watershed Study
(also referred to as "Assessment" or "State of the Watershed")

- Compiles information taken from federal and state agencies, grass roots groups, students, and others;
- Describes the many unique natural resources, water quality, land use, and land use regulations;
- Identifies relationships and opportunities within the watershed.

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Accumulating information about the watershed is important

- Demonstrates the value of the resource to the community;
- Identifies risks to watershed quality;
- Links human activity to impacts on the stream.

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Information found about the OC

- Natural Features;
- Human Impacts;
- Technical & Scientific Observations;
- Laws & Regulations related to the watershed, including local land use;
- Issues, Conclusions, & Recommendations.

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Natural Features

- Wetlands
- Flood Plains
- Steep Slopes
- Soils
- Aquifers
- Karst Terrain
- Water Bodies (surface water)
- Land Cover

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Natural Features - Wetlands

Wetland west of Bennett Hill

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Wetlands and Hydric Soils

- Hydric soils are areas which are under water some part of the year;
- State protection is given to wetlands 12.4 acres and over, including a surrounding 100 foot buffer;
- Wetlands smaller than 12.4 acres are protected by the US Army Corps of Engineers.

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Benefits of Wetlands

- water is filtered and purified improving water quality;
- serve as important wildlife and plant habitats;
- provide natural storage basins aiding in groundwater recharge and reducing downstream flooding.

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Flood Plains should not be built in

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Natural Features – Flood Plains

- provide an area for water storage during high flows, helping to decrease flooding downstream;
- act as nutrient and sediment sinks, improving water quality;
- providing important spawning and rearing areas;
- flood plains are relevant to water quality protection and restoration.

36

Steep slopes can result in loss of land and sedimentation and pollution of the stream.

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Natural Features – Steep Slopes

- Areas having a slope of 15% or greater.
- development in these areas should be avoided;
- stormwater runoff on steep slopes poses a high risk of soil erosion and pollution;
- unsuitable for septic systems;
- risk of landslides when clay is present .

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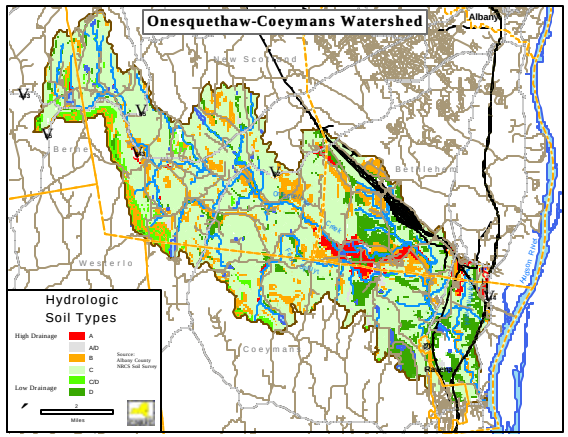

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Natural Features – Soils

- affects erosion and stormwater runoff;
- impacts various human uses and the importance for plants and animals;
- should be fully researched for community plans, zoning, and site plan reviews;
- information can be found in most county soil surveys published by the Natural Resource Conservation Service.

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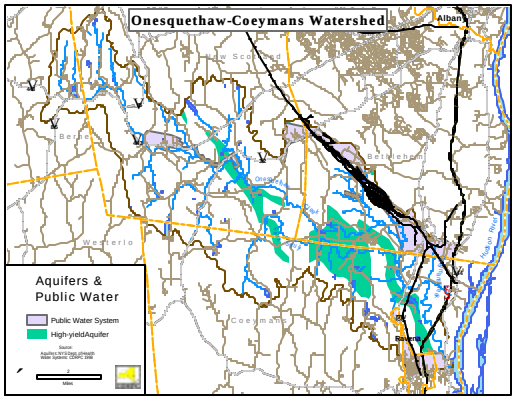
Natural Features – Aquifers



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Aquifers

- a geologic formation composed of rock, till, sand, gravel, and/or sediment that can store and transmit water in usable quantity;
- it is important to know the location of aquifers so that they can be protected from land uses that may pollute the water.

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Bedrock Geology

- From Wolf Hill Dam to South Albany, there is a corridor of karst terrain;
- Karst terrain provides high velocity, underground conduit-flow aquifers;
- This area is considered hypersensitive to pollution due to the thin soil mantle.

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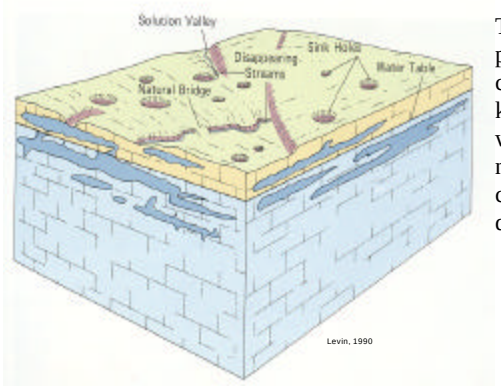
A large area of limestone bedrock underlies much of the Onesquethaw -Coeymans Watershed.



This area is primarily composed of karst terrain, which presents natural constraints for development.

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Natural Features – Karst Terrain

- a type of terrain formed by the dissolution of soluble carbonate rock (limestone and dolomite);
- high velocity conduits develop through which water moves quickly;
- streams begin to lose water to developing cave systems below.

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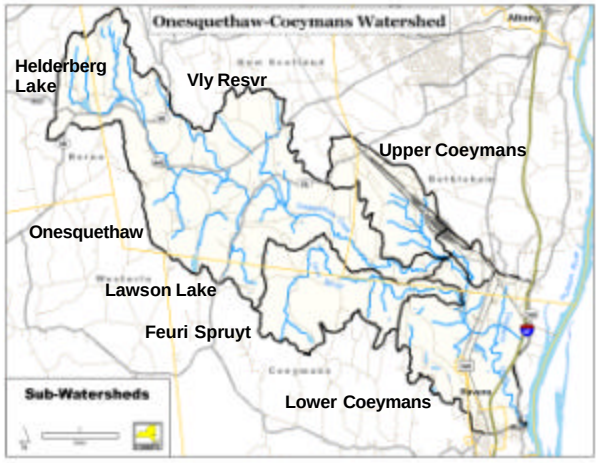

Natural Features – Water Bodies

- used for drinking water and recreation and also serve as vital habitat;
- tributaries feed the 19-mile main branch including Flat Rock Brook, Feuri Spruyt, Mosher Brook, and the Upper Coeymans Creek.

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Swimming hole in the Lower Coeymans. Also home to large trout.

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Water Bodies

- streams are classified by the NYS DEC based on the best use;
- special requirements apply to protect sensitive waters;
- a permit is required for disturbing the stream bed or banks classed as C(T) or higher (suitable for trout);
- Most of the OC is classified C(Ts), or trout spawning habitat.

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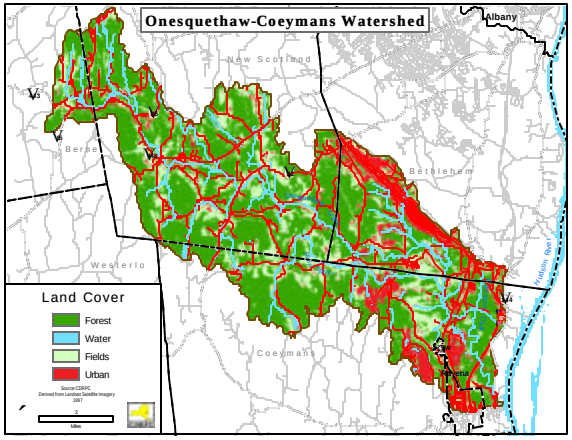

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Natural Features – Land Cover

- The CDRPC performed an analysis for the OC watershed;
- land cover categories analyzed were: forests; fields; water; and non-vegetated, impervious and semi-impervious areas;

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Selkirk Rail Yards

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Land Cover

- Forested areas make up approximately 65%;
- "Fields" are about 24% , most of this land is used for agricultural purposes;
- Water features comprise approximately 1%;
- "Urban" (buildings, paved surfaces, rail yards, exposed rock and soil, other non-vegetated surfaces) is about 10% and is considered mostly impervious.

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Human Impacts

- Existing Land Use
- Population Growth and New Development
- Nonpoint Source Pollution
- Point Source Pollution
- Public Water and Sewer
- Water Diversions
- Landfills
- Trout Stocking
- Dams and Barriers
- Agriculture

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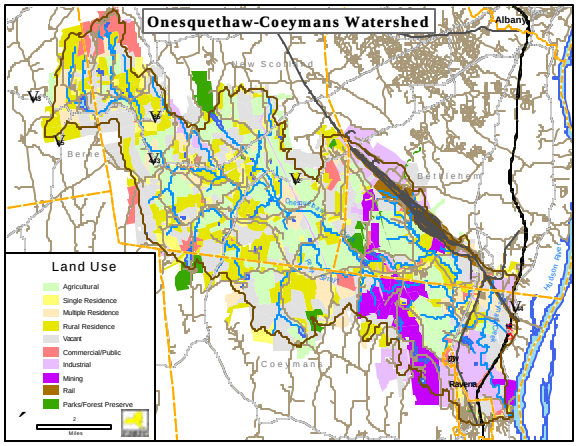

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Watershed Land Use

- 26% - Natural habitat
- 19% - Industrial
- 19% - Agricultural
- 18% - Rural homes on 10 or more acres
- 6% - 1,700 single-family homes on less than 10 acres
- 4% - Commercial development
- 8% - Other use

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Impacts of Development

- Total impervious surfaces in the watershed equal about 10% of the land surface;
- *(where impervious surfaces reach 10-15%, impacts on the stream become more pronounced)*
- 5.4% of this is due to the Rail Yards, quarries and a cement plant;
- *(cleared areas still may have some seepage and may not be totally impervious)*
- 4.6% is due to rooftops, roads, etc.

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Natural Features

- The Creek has naturally reproducing trout throughout its length;
- Most of the stream is classified by DEC as C(ts), or trout spawning.

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Human Impacts - Growth

- The watershed's 2.7% population growth rate from 1990 to 2000 was higher than Albany County as whole;
- The majority of the new development within the watershed since 1990 has been single-family homes on large lots;
- This type of development creates much more impervious surface, and stormwater runoff, than do smaller parcels fronting public roads.

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Human Impacts – Land Use

Ravena-Coeymans-Selkirk School & Cement Plant

The stream and its watershed provide many economic, industrial, commercial, wildlife, and recreational community uses.

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Human Impacts – Non Point Source Pollution

- results from precipitation, land runoff, infiltration, drainage, seepage, hydrologic modification, or atmospheric deposition;
- enters a water body from diffuse origins rather than from discrete sources;
- the primary source of contamination for more than 90% of the impaired NYS waterbodies.

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There are about 26 permits for point source discharges.

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Human Impacts – Point Source Pollution

- Sources of discharges at specific locations from pipes, outfall, and conveyance channels are “point” sources;
- The SPDES (State Pollution Discharge Elimination System) permitting program is intended to regulate point source discharges;
- The SPDES system is essentially self-monitoring.

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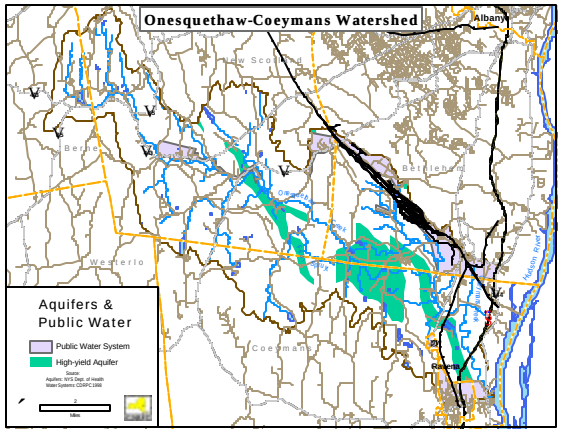

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Human Impacts – Water & Sewer Systems

- There are four areas with public water systems serving about 1500 people;
- Three of the systems use groundwater wells;
- Remaining users (approximately 1300 households) use individual wells;
- Sewer service is limited to the Village of Ravena and a portion of the Town of Coeymans;
- Remaining population uses individual septic systems.

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69

Human Impacts – Landfills

- three closed landfills were found, two of which are known to be unlined:
- the Town of Bethlehem's closed dump;
- a closed Town of New Scotland land fill;
- a construction and demolition landfill known as the "Metz" site.

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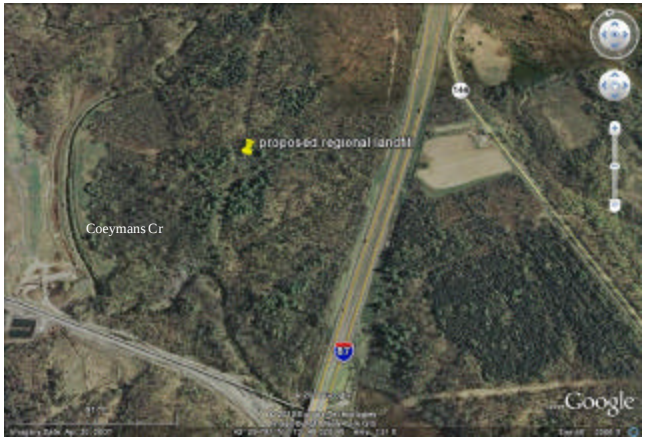

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Human Impacts – Landfills

- In 1991, the city of Albany initiated a landfill siting investigation;
- The contemplated regional landfill would use 343 acres, located in the town of Coeymans between the western side of Interstate 87 and Coeymans Creek;
- In December 2007, the city of Albany purchased the land for this site although it has not proceeded with the permitting process.

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Individual activity without SEQRA permit

73

Human Impacts – other

- Activities can occur in violation of regulations
- Some go undetected
- Public outreach and education is important

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Recreational Uses

Trout Fishing

75

Human Impacts – Trout Stocking in Coeymans Creek

- Lower Coeymans Creek was stocked from 1924 through 1962 with brown and rainbow trout;
- Stocking of Lower Coeymans Creek apparently ended in 1962 due to reported pollution;
- No stocking of Upper Coeymans Creek (above the confluence with Onesquethaw Creek) has ever occurred or been recommended due to pollution.

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Brown Trout

American Eel

77

Human Impacts – Trout Stocking, Onesquethaw Creek

- Onesquethaw Creek above the confluence with Upper Coeymans Creek has been stocked since 1924;
- Natural reproduction of wild brown trout throughout the stream has been documented;
- Recent stocking has been limited to the Clarksville area;
- Some sites are no longer stocked due to posting.

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Wolf Hill Diversion
diverts water to Vly Reservoir

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Human Impact - Diversions

The Upper Onesquethaw Creek provides drinking water for the Town of Bethlehem

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Recreational Uses

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Recreational Uses

- Swimming, hiking, spelunking, and wildlife watching.

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Recreational Uses

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Recreational Uses

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Human Impacts – Dams & Barriers

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Dams and Barriers

- Change stream flow pattern;
- interrupt sediment and bedload transport;
- prevent migration of fish and other fauna;
- and increase concentration of some toxic chemicals.
- Waterfalls and sections with underground flow are natural barriers to fish movement.

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Human Impacts - Agriculture

- Agriculture is a predominant land use;
- There are approximately 2500 acres of farmland producing hay, corn, and grain;
- The watershed contains three of the largest dairy farms and one of the largest beef feedlots in New York State.

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Monitoring & Observations

- Water Quality and Biomonitoring
- Flow Data
- Temperature Monitoring
- Fish Surveys
- Stream Stability
- Biodiversity
- Climate and Precipitation

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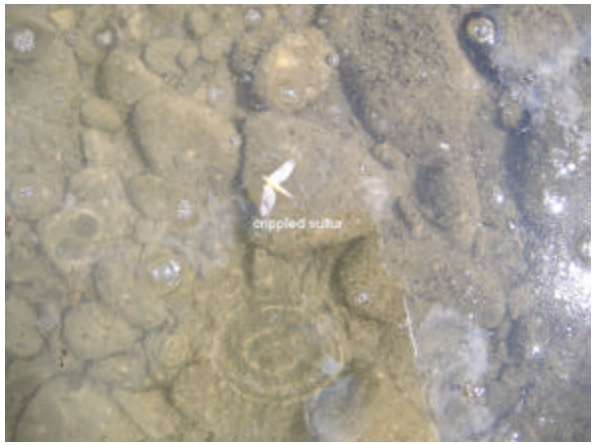

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Monitoring – Water Quality

- Biomonitoring is the sampling of benthic macroinvertebrates (BMI - aquatic insects living on the stream bottom).
- The numbers and types of BMI provide data for an assessment of overall stream ecosystem health and water quality.

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Monitoring – Water Quality

- "30 Year Trends in Water Quality … in NYS Based on Macroinvertebrate Data 1972 - 2002", 2004 by DEC's Stream Biomonitoring Unit
- decline and/or severely impacted water quality at several locations on Onesquethaw Creek
- Probable stressors are nonpoint source nutrient enrichment, municipal/industrial inputs, and siltation

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Monitoring – Flow Data

- The US Geological Survey (USGS) monitored stream flows from August 29, 1967 through September 30, 1977
- The data is available at the website http://nwis.waterdata.usgs.gov/ny/nwis
- The flows measured indicate a large variability, with average daily flow ranging from 0.6 cfs on July 27, 1976 to 1,490 cfs on June 30, 1973

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Monitoring – Temperature

- Temperature is important to cold water species like trout
- Temperatures exceeding 75°F for extended periods are often lethal to trout
- Starting in 2001, volunteer members of Trout Unlimited began monitoring stream temperature
- Concluded that temperature is not a limiting factor to trout survival, throughout the entire length of the stream

98

The American Eel uses the creek as its adult home until it returns to the ocean to spawn.

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Monitoring – Fish Surveys

- Fish found include the American eel, rated a "species of greatest conservation need" by DEC, stickleback, sculpin, dace, sucker, and brown trout.
- As a valued sport fish, the trout has received special attention,
- the OC has a healthy self-sustaining population of wild trout

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DEC Fisheries Staff electrofishing
Pictuay Road

Monitoring – Fish Surveys

- Trout populations increase upstream from the mouth until they peak in the vicinity of County Route 102 (Old Quarry Road) in the Town of Bethlehem
- No fish, trout or otherwise, were found in Upper Coeymans Creek, upstream of the confluence with Onesquethaw Creek due to pollution

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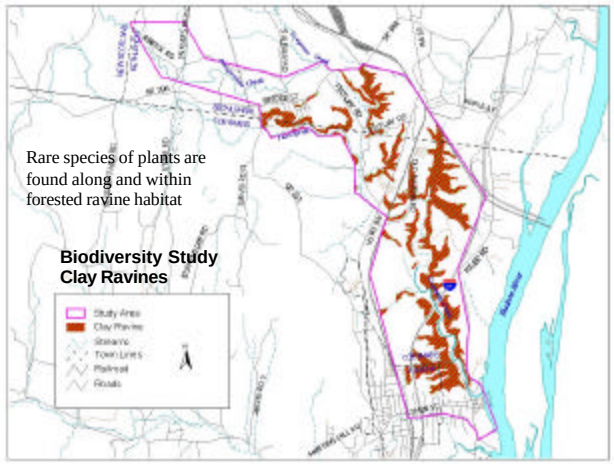

Monitoring –

- Other factors monitored were:
- Stream stability
- Biodiversity
- Climate and precipitation

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Information found about the OC
Laws & Regulations – Local Land Use

- Wide variation in the development pressures among the municipalities
- Broad range in the way the communities regulate land use
- Land use regulations are often found in various places throughout the ordinances
- Inconsistent regulation location within the ordinances and variation in the requirements themselves can be confusing
- Water quality impacts may be insufficiently considered
- The Center for Watershed Protection provides guidelines for evaluation of regulations at http://www.cwp.org/cow_worksheet.htm and http://www.cwp.org/better_site_design.htm

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Issues, Conclusions, Recommendations

- Future Development and Land Use Practices
- Issues and Outreach for Communities
- Landfills
- Industrial Activity, and Point Discharges
- Barriers and Water Diversion
- Impervious Surfaces
- Stream Stability
- Public Access
- Riparian Buffers
- Land Conservation
- Agriculture

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Recommendations - Development and Land Use Practices

- Protect Sensitive Environmental Areas
- Establish Stream and Wetland Buffers
- Reduce Impervious Surfaces Through Smart Growth
- Control Erosion From Construction Activity
- Manage and Treat Post-Construction Runoff
- the ***NYS Stormwater Management Design Manual*** available from the NY DEC: http://www.dec.ny.gov/chemical/29072.html

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Recommendations – Outreach for Communities

- Detect and Eliminate Illicit Discharges
- Educate the Public About Water Pollution Prevention Practices
- Discourage the Unnecessary Use of Pesticides

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Recommendations – Landfills

- Form partnerships to create recreational access and to establish riparian vegetated areas
- Gather information about each site, such as years of operation, amount and type of materials dumped, closeness to the stream, and the results of any monitoring
- Once studies at the site of the proposed City of Albany Regional Landfill are released to the public, they should be made part of this study as an addendum

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Recommendations – Industrial Activity and Point Discharges

- Watershed contains the heaviest industrial activity in Albany County
- DEC monitoring indicates toxic contaminants in the Upper Coeymans
- There are over 50 permitted point discharges
- Concentrated joint effort should be made to evaluate the sources of toxic and other contaminants, and the cumulative effects of point discharges
- Form partnerships to find financially viable solutions

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Recommendations – Barriers and Diversions

- 5 waterfalls and 2 areas which flow underground
- one dam diverts water for drinking water
- several culverts that can be viewed from a road
- Feuri Spruyt tributary travels about ¼ mile under a rock quarry
- Upper Coeymans Creek travels about ¼ mile under the Rail Yards

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Recommendations – Impervious Surfaces

- impervious surfaces are about 10% of the watershed land area
- shallow limestone bedrock (Karst topography) of the upper watershed, and the steep clay ravines of the lower watershed, already produce significant rapid runoff
- addition of impervious surfaces can only worsen this condition
- evaluate the relation of stream discharge to rainfall and land use, and compare to other stream systems

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Recommendations – Stream Stability

- Use natural channel restoration on the stream corridor from Old Quarry Road to NY Route 9W
- assess stream bank and channel conditions
- determine desirable vegetative buffer widths
- Restore existing eroded sites
- Identify surrounding wetlands as possible correction tools

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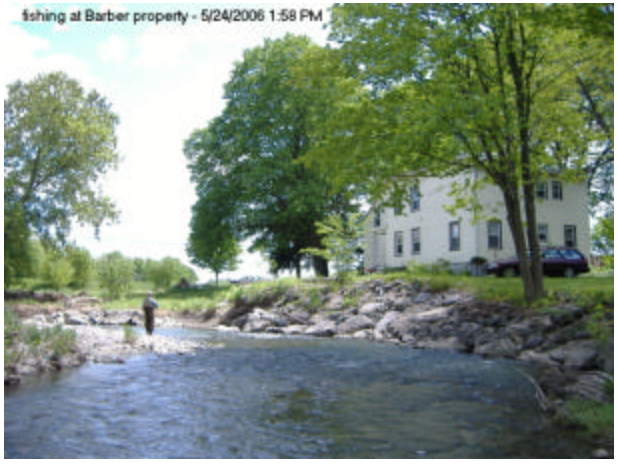

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Recommendations – Public Access

- Beautiful natural features such as waterfalls, caves, and gorges
- Significant recreational resources
- Healthy population of wild trout
- Community organizations, local municipalities, and agencies should be aware of opportunities to obtain land and easements for public benefit

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Recommendations – Riparian Buffers, Land Conservation, and Agriculture

- Use partnerships and volunteers to improve riparian buffers
- Seek opportunities to conserve unique and valuable natural features
- Assist where possible the protection of natural resources on farm land

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