Private Forests & Public Benefits: New York City Watershed

Ira Stern – Director

Watershed Lands & Community Planning

NYC DEP - Bureau of Water Supply

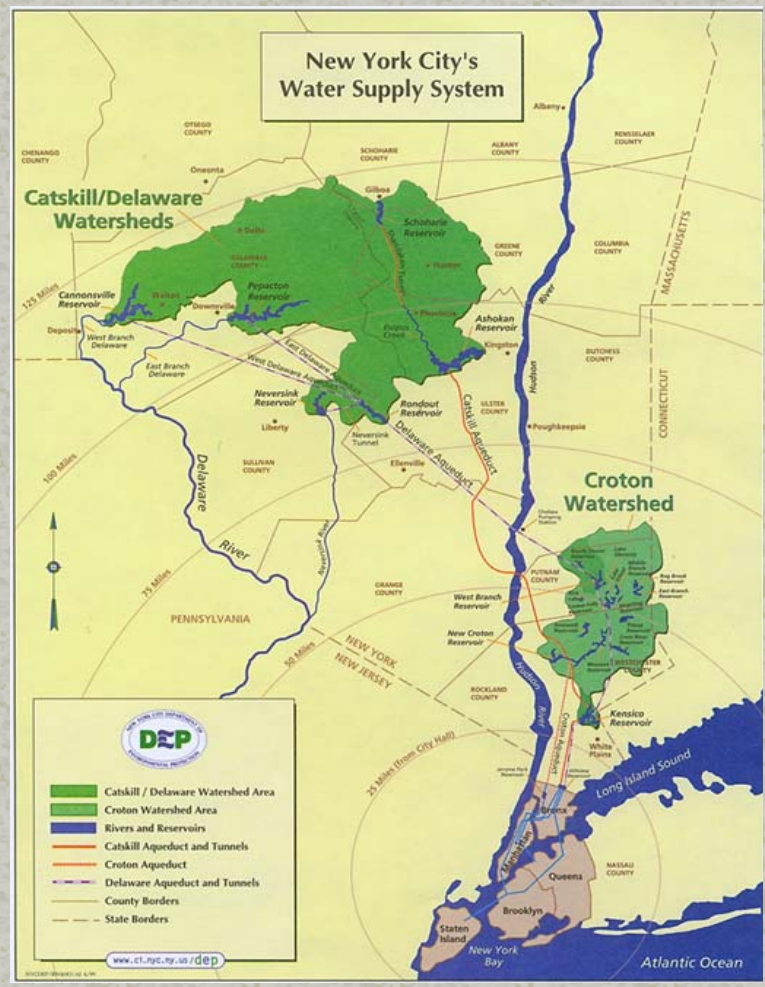
Bureau of Water Supply

MISSION

Deliver a dependable supply of the highest quality drinking water to 9 million people in NYC and several upstate communities

Land, Water & People

- 19 reservoirs, 3 lakes
- 1,969 sq. miles
- (Cat/Del + Croton)
- 8 counties, 60+ towns
- ~240,000 residents
- 9 million consumers
- 1.3 billion gallons/day



New York City owns < 10% of the land in its water supply system

TIMELINE

Life of a Water Supply

- 1677 First Well in Manhattan
- 1776 First Reservoir (Lower B'way)
- 1842 Croton System Initiated
- 1915 Catskill System Initiated
- 1931 Supreme Court Decision Clears Way for Delaware System
- 1967 Cannonsville Reservoir Completed


ENTERING
CANNONSVILLE
RESERVOIR
THIS VALLEY TO BE FLOODED
BY WATER IMPOUNDED BY THE CANNONSVILLE
DAM NOW UNDER CONSTRUCTION
BOARD OF WATER SUPPLY
CITY OF NEW YORK

TIMELINE

Life of a Water Supply

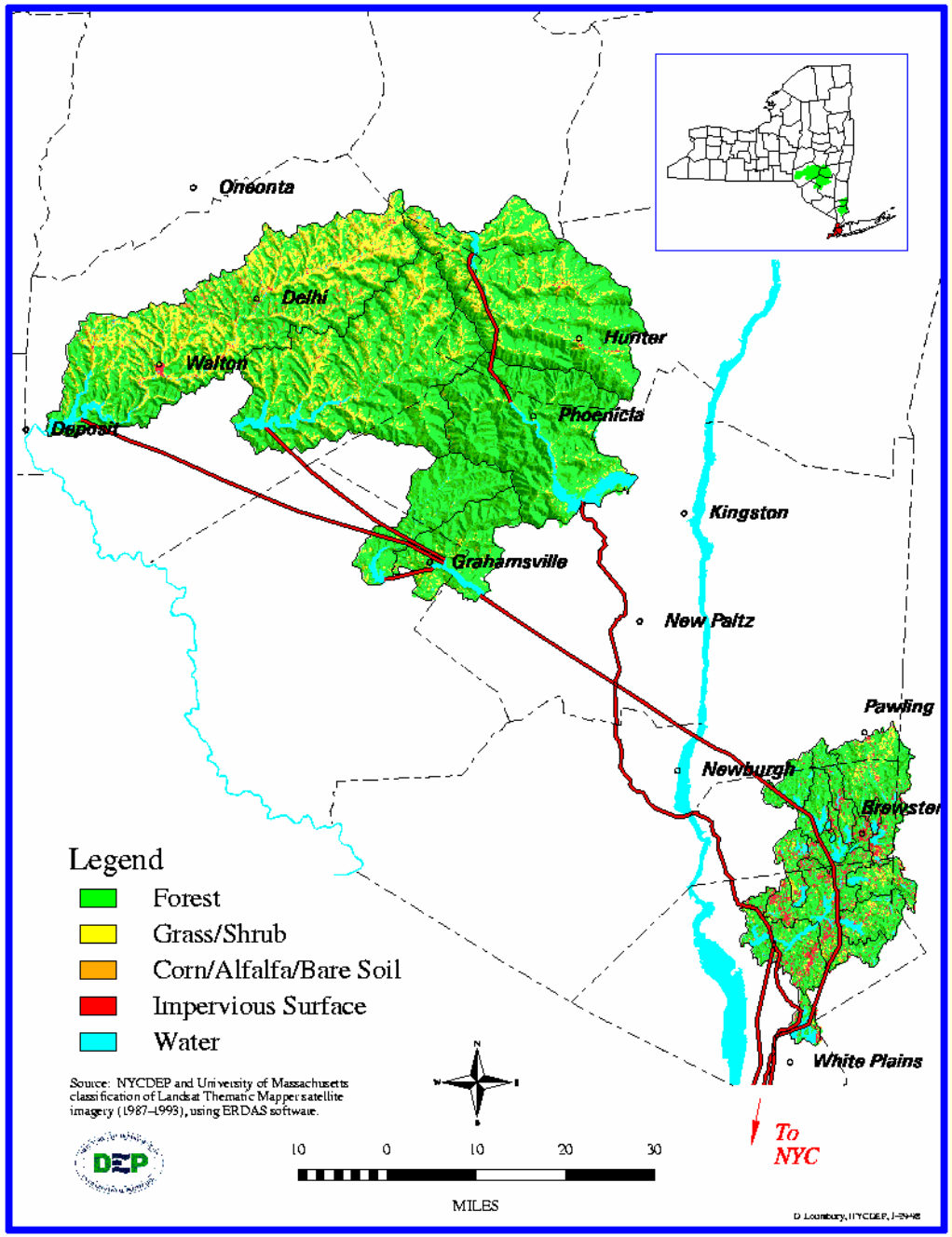
- 1989 Filtration Avoidance Sought by City
- 1990 Draft Regulations Issued and Controversial
- 1995 Negotiations Result in Watershed Agreement
- 1997 Agreement Signed
- Filtration Avoidance Determination: 1997-02

1997 NYC Watershed Memorandum of Agreement

- 250 negotiating sessions – EPA, State, local communities (EOH/WOH), special interest groups
- Agreement in Principle 1995
- Final Agreement Signed by more than 60 signatories in 1997
- Includes Land Acquisition Permit, New City Land Use Regs, Partnership Programs, Conflict Resolution Process

THREATS TO WATER SUPPLY

- Pathogens
  - Human and animal waste
  - Sources include septics, wwtp, farms, stormwater
- Nutrients
  - Fertilizers from lawns and farms, wastewater, stormwater
- Sediment
  - Natural and human induced erosion
  - Streambank and bed erosion/poorly designed logging roads/inadequate stormwater infrastructure
- Coliforms
  - human and animal waste
  - waterfowl, failing septics, stormwater



Generalized Land Cover –New York City Water Supply

City of New York
Watershed Lands & Community Planning

Land Use Planning Map

West of Hudson Watershed

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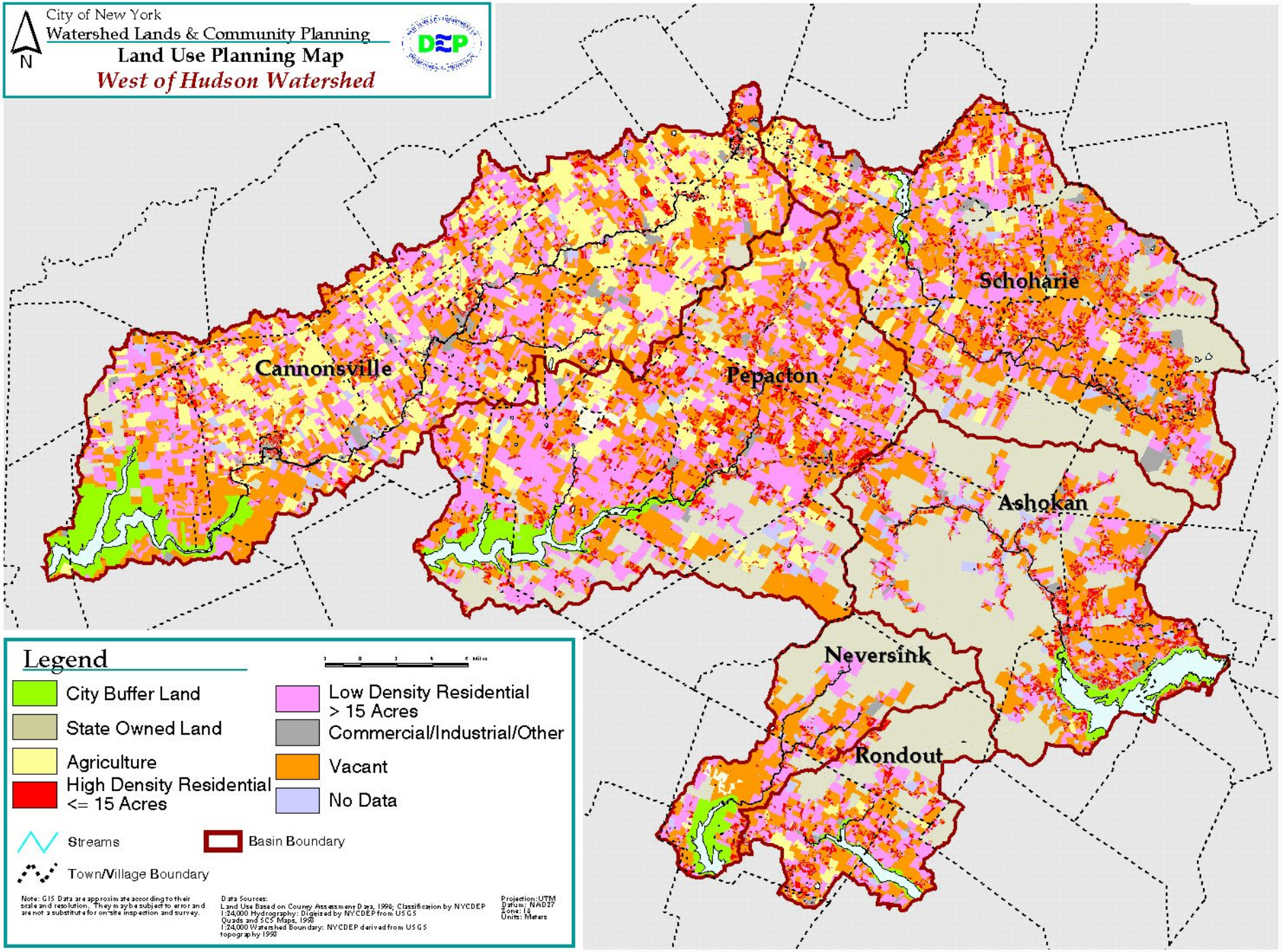


Legend

- City Buffer Land
- State Owned Land
- Agriculture
- High Density Residential <= 15 Acres
- Low Density Residential > 15 Acres
- Commercial/Industrial/Other
- Vacant
- No Data
- Streams
- Basin Boundary
- Town/Village Boundary

Note: GIS Data are approximate according to their scale and resolution. They may be subject to error and are not a substitute for on-site inspection and survey.

Data Sources:
Land Use Based on County Assessment Data, 1998; Classification by NYCDEP
1:24,000 Hydrography: Digitized by NYCDEP from USGS Quads and SCS Maps, 1998
1:24,000 Watershed Boundary: NYCDEP derived from USGS topography 1998

Projection: UTM
Datum: NAD27
Zone: 18
Units: Meters

Watershed Protection Program

- Filtration Waiver from EPA
- 1997 Watershed Agreement
  - Land Acquisition Program
  - New Watershed Rules and Regulations
  - Partnership Programs
- Extensive Water Quality Monitoring Program
- Enforcement and Security

Land Acquisition

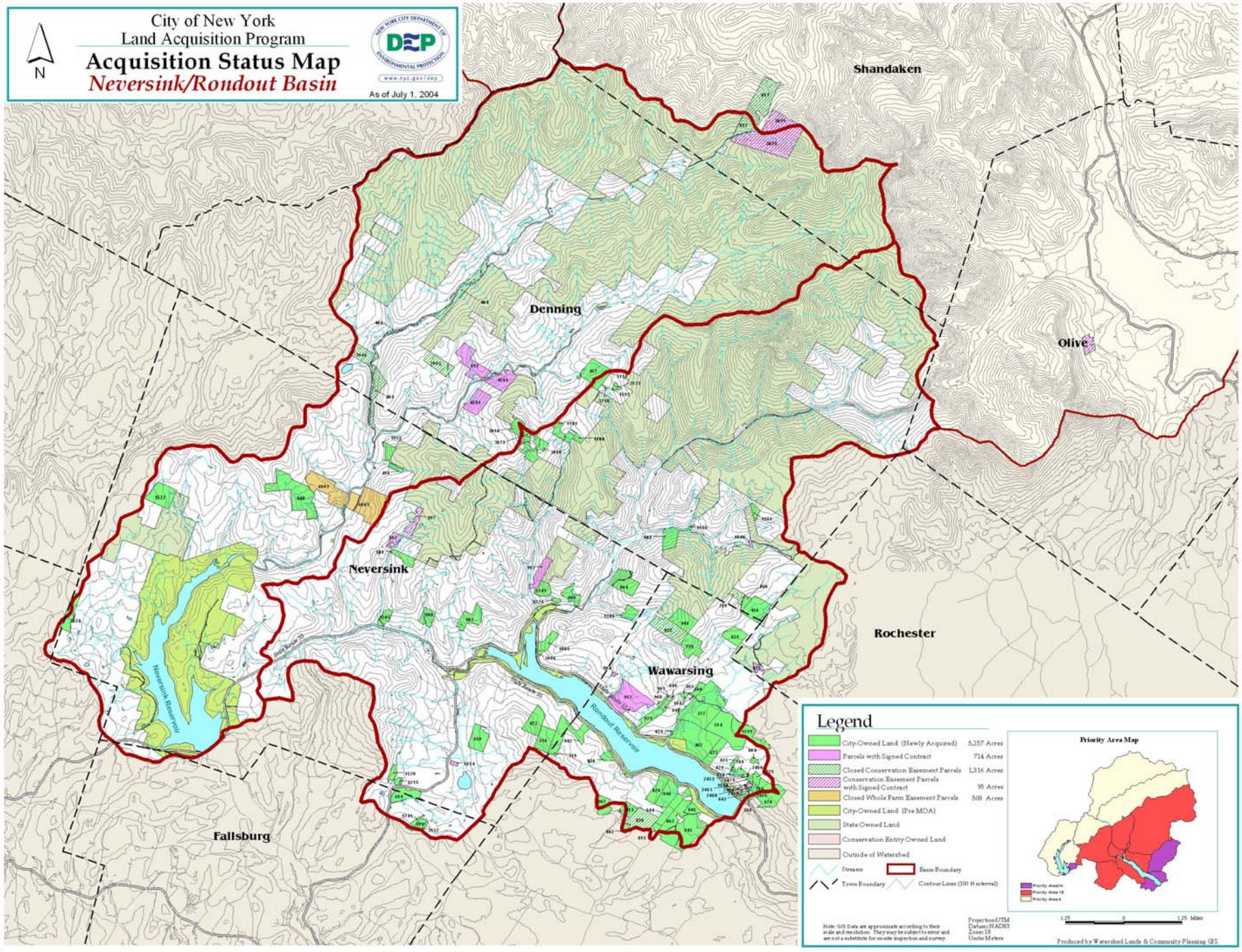
- purchase priority watershed lands at fair market value
- fee title and conservation easements
- willing buyer/willing seller
- 20,000 acres purchased in last three years

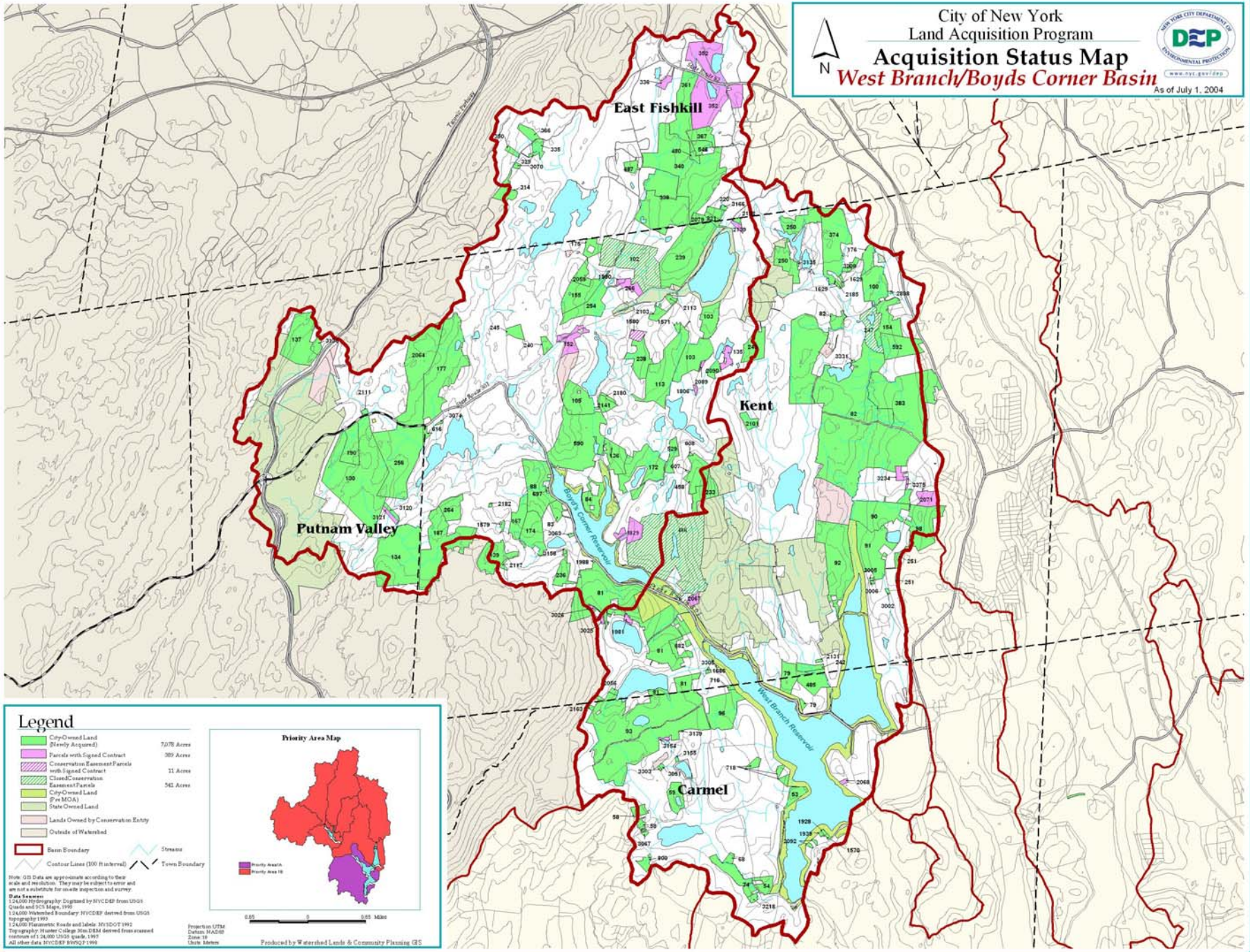
and Stewardship

- management of a 100,000 acre water quality reserve
- fishing, hunting, and hiking where compatible with water quality protection
- forest management

DEP Land Acquisition Status (9/05)

- 810 Newly Acquired Parcels
- 65,727 Acres Added
- Have Tripled City Land Holdings Since 1997
- $182 Million Spent
- More Than 100,000 Acres Open for Recreational Use


City of New York
Land Acquisition Program
Acquisition Status Map
Neversink/Rondout Basin
As of July 1, 2004
N
Shandaken
Denning
Olive
Neversink
Rochester
Wawarsing
Fallsburg
Neversink Reservoir
Rondout Reservoir
State Route 55
State Route 55
Legend
City-Owned Land (Newly Acquired) 5,257 Acres
Parcels with Signed Contract 714 Acres
Closed Conservation Easement Parcels 1,316 Acres
Conservation Easement Parcels with Signed Contract 95 Acres
Closed Whole Farm Easement Parcels 509 Acres
City-Owned Land (Pre MOA)
State Owned Land
Conservation Entity Owned Land
Outside of Watershed
Streams
Basin Boundary
Town Boundary
Contour Lines (100 ft interval)
Priority Area Map
Note: GIS Data are approximate according to their scale and resolution. They may be subject to error and are not a substitute for on-site inspection and survey.
Projection/TM
Datum: NAD83
Zone: 18
Units: Meters
1.25 0 1.25 Miles
Produced by Watershed Lands & Community Planning GIS

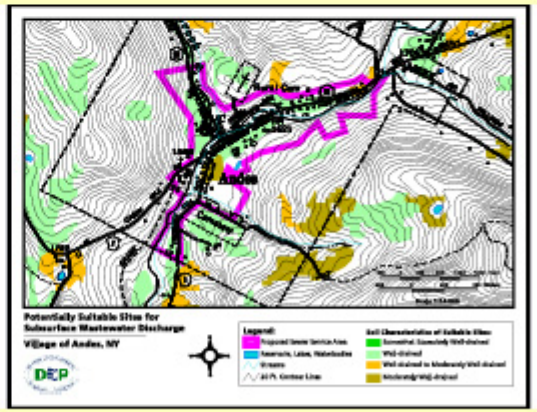


West Branch, July 2004

Community Planning

- Watershed rules and regulations require:
  - limits on location of impervious surfaces
  - tertiary wastewater treatment
  - phosphorous offset pilot program

- regional watershed plans
- wastewater diversion studies
- wastewater and stormwater planning
- sustainable economic development



Environmental Infrastructure

- community wastewater solutions
- upgrade all wastewater treatment plants in the watershed

- stormwater retrofit
- sand/salt facility improvement
- septic repair and replacement

Community Planning and Infrastructure Status

- 2000 septic systems repaired/replaced (CWC)
- all deicing storage facilities replaced (CWC)
- top 5 communities in need for new wastewater treatment systems in various stages of completion (DEP)
- WWTP upgrade program with each facility/ construction on major facilities almost complete (DEP)
- stormwater retrofits and new construction mitigation being implemented (CWC)
- Croton Planning complete

Agriculture and Forestry

- Whole Farm Planning as a voluntary alternative to regulations
- administered by non-profit Watershed Agricultural Council in partnership with NYC DEP

- Best Management Practices to reduce pathogens, nutrients and sediment
- program includes forestry, economic development, and agricultural conservation easements

Nutrient Management Plan

Crop Year 2000

CORNELL NUTRIENT MANAGEMENT PLANNING SYSTEM
Cornell Cooperative Extension

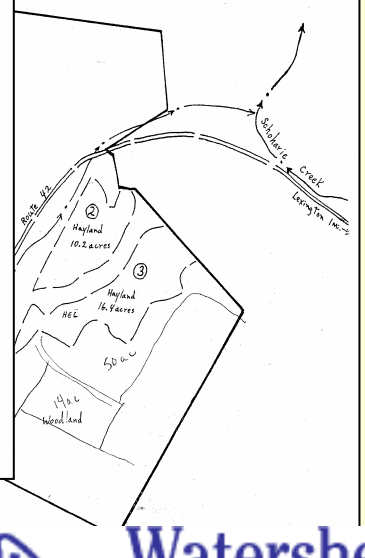
Nutrient Management Plan Prepared For:

John Falke
Box 267

SCS - CPA - 16
2 - 81

SERVATION PLAN MAP

Operator John & Donna Falke
State NY Date 10/96
Approximate scale 1" = 660'
Soil & Water Conservation District
Jenkins & State Photo number
an White, Pet Ravakos USDA Soil Conservation Service



Falke Farm
John and Donna Falke
Box 267
Prattsville, NY 12468

WATERSHED AGRICULTURAL PROGRAM

Revised by:
Daniel Flaherty, CCE
George Stang, NRCS
Richard Mall, SWCD
January 2000

Watershed Agricultural Council

FOR NEW YORK CITY'S WATER SUPPLY WATERSHED

Promoting Whole Farm Planning in the Catskill Region

Agriculture and Forestry Status

- 398 farms participating
- 2156 BMPs installed on farms
- WAC implementing “small farm initiative”
- Conservation Reserve Enhancement Program (CREP) making progress – over 170 miles
- 83,000 acres under forest management planning
- BMP program – roads, bridges, erosion control
- Logger Training and Model Forests

Stream Management

- multi-objective stream management plans for priority rivers
- partnerships with local landowners, conservation groups, and municipalities

- geomorphic assessment surveys and database development
- stream restoration project design, construction and bioengineering

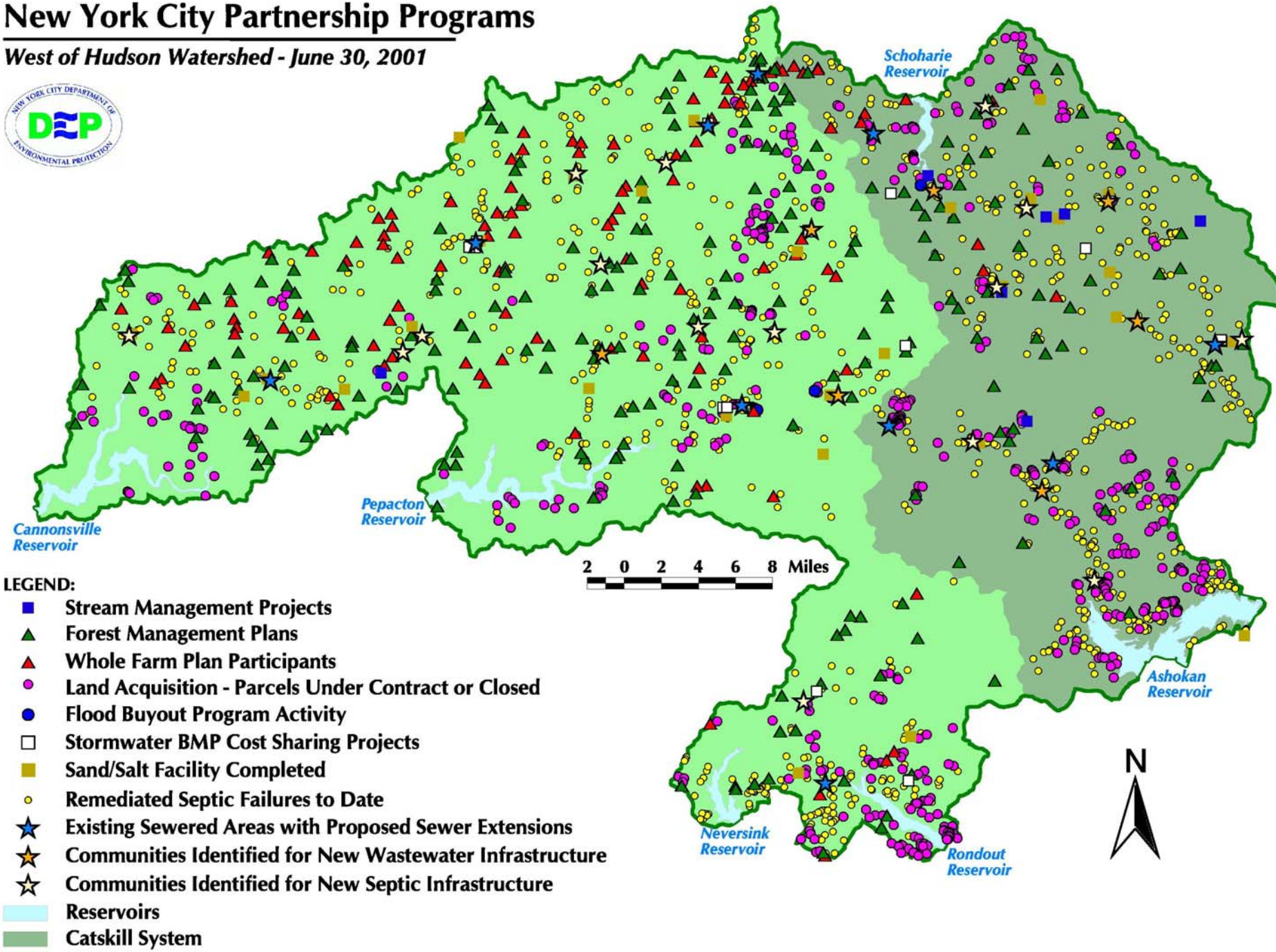
- professional trainings and public workshops
- wetland protection and education

Stream Management Status

- Stream Management Plans developed for Stony Clove, Batavia Kill, Chestnut Creek, Broadstreet Hollow, West Branch Delaware
- Esopus Creek and West Kill plans underway
- Restorations complete on Batavia Kill, Stony Clove, West Kill, Town Brook and Broadstreet Hollow – more to follow
- regional curves and stable reach database being developed
- SDWA funded evaluation strategy being implemented
- education, training, and outreach

New York City Partnership Programs

West of Hudson Watershed - June 30, 2001



Projected City Ownership

- **Today**
  - **Reservoirs: 33,000 acres**
  - **Buffer Lands: 45,000 acres**
  - **Lands Added since 1997: 40,000 acres**

- **By Year 2007**
  - **Reservoirs: 33,000 acres**
  - **Fee Lands: 100 to 127,000 acres**
  - **Easement Lands: 20 to 30,000 acres**

- **City Management of Between 154,000 & 191,000 acres of lands and reservoirs (12-15% of the watershed).**

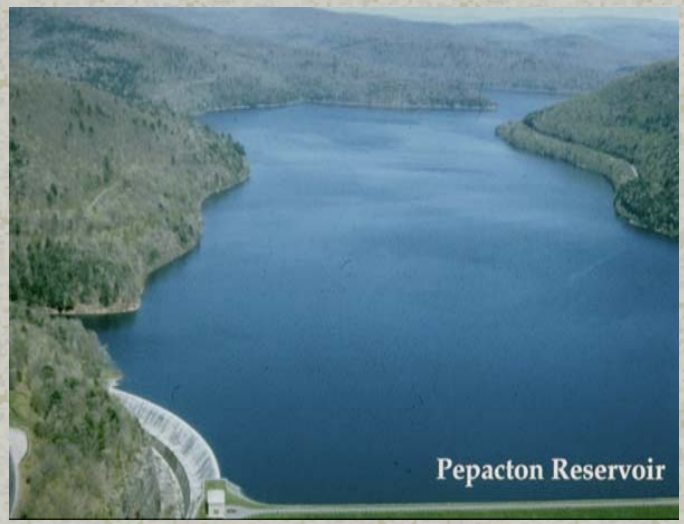
Goals for Public Access to Water Supply Lands

- Drinking water quality
- Fulfill obligations and agreements
  - Water Supply Act (1905)
  - Memorandum of Agreement (1997)
- Provide community benefits
- Offer high-quality outdoor recreation opportunities
- Promote land stewardship
- Encourage understanding of ecosystem functions

Activities on Water Supply Lands

- Activities that are compatible with high water quality:
  - fishing
  - deer hunting
  - hiking
  - snowshoeing
  - X-country skiing
  - Nature observation/ study (e.g., birding)

Watershed Land Uses



- **Catskill/Delaware**
  - Farmland ~ 10%
  - Forestland ~ 87%
  - Developed ~ 1%
- **Croton (EOH)**
  - Farmland ~ 7%
  - Forestland ~ 66%
  - Developed ~ 13%

Forests cover >75% of the watershed land area

Who owns the forest land?

- Private ~ 68% (farms and forest)
- State ~ 23% (including “forever wild” Catskill Forest Preserve)
- City ~ 9% (reservoirs, buffer lands, new recreational lands)

Working Landscapes

Well-managed farms and forests provide the most beneficial land cover for water quality protection.

Working Forests, Working People

Watershed Forest Industry

- 200-270 watershed loggers
- 35-50 private consulting foresters
- ~38 local sawmills + 1 fiberboard plant
- 600-1,200 forest industry employees
- 8 largest sawmills employ 500+ people
- 15,000+ forest landowners (10+ acres)

Connecting Forest to Faucet

Protecting Water Quality

Watershed Forestry Program

WAC offices in Delaware & Westchester Counties

Major Program Areas

- Forest Management Planning*
- BMP Implementation
- Logger Training
- Model Forests (Research & Demonstration)
- Education and Outreach
- Economic Development (incl. Tax Policy)

Forest Management Planning

- Private landowners
- Private foresters
- Funding for long-term stewardship plans
  - $456,000 = DEP funds
- 450 plans
- 83,100 total acres
  - 188 acres = average plan
- 64,700 forested acres
  - 146 acres = average plan

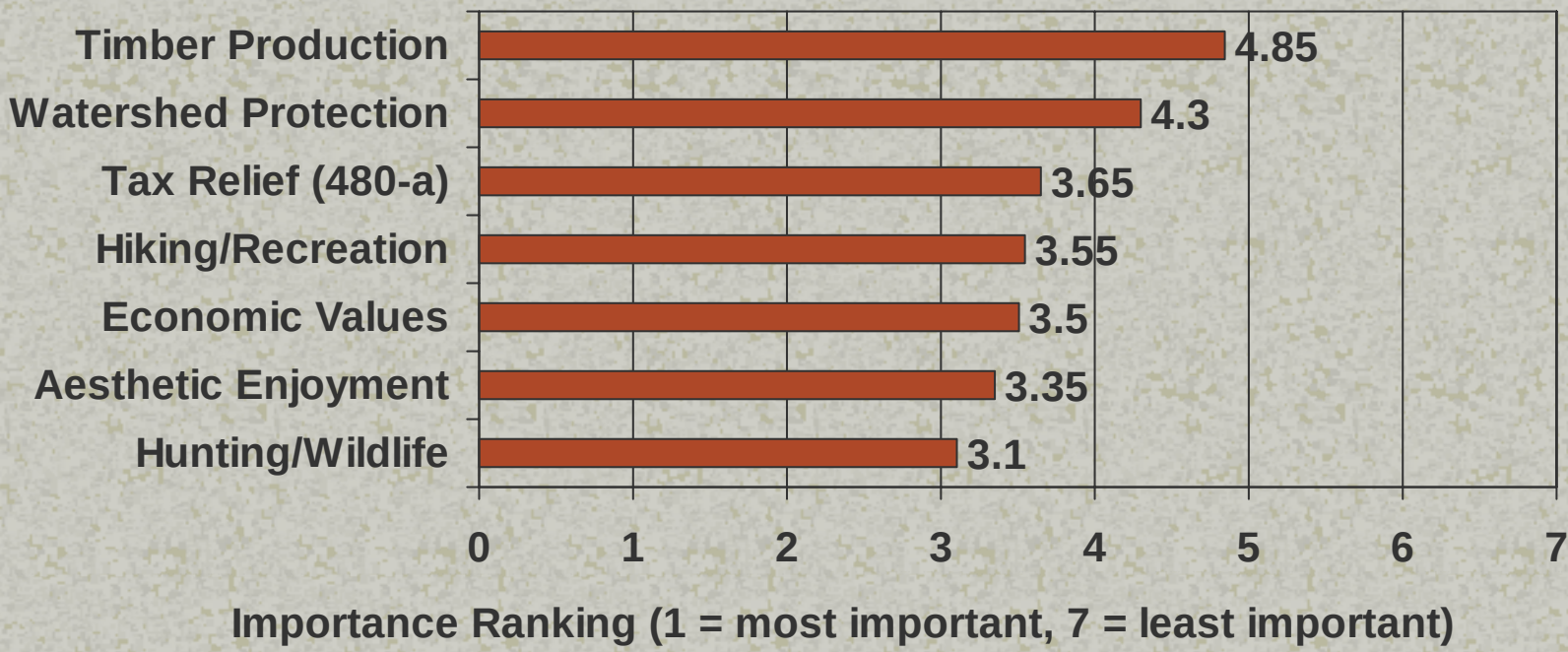
Q: Why do landowners own their forests?
A: For many reasons, not just timber!

2004 survey results for 1,331 private landowners in VT, NH & MA: (source: Journal of Forestry - Jan/Feb 2005)

Privacy	43%
Part of residence	39%
Conservation & Beauty (each)	31%
Recreation & Wildlife habitat (each)	29%
Personal use of forest products	25%
Investment	21%
Inheritance for children	19%
Part of farm	18%
Income from wood products	14%

Q: Why do landowners have a forest plan?
A: For many reasons, not just timber!

2003-2004 survey results for 33 watershed landowners with a 5-year old WAC forest management plan:



NYS Forest Tax Law (480-a)

- 73% of WAC plans are eligible to enroll (contain 50+ forested acres)
- 39% of eligible plans are enrolled
  - 6% enrolled before WAC Forestry Program
  - 33% enrolled after WAC Forestry Program
- Delaware County = highest participation
  - 82 plans, or 65% of enrolled plans
- Greene County = second highest
  - 33 plans, or 26% of enrolled plans

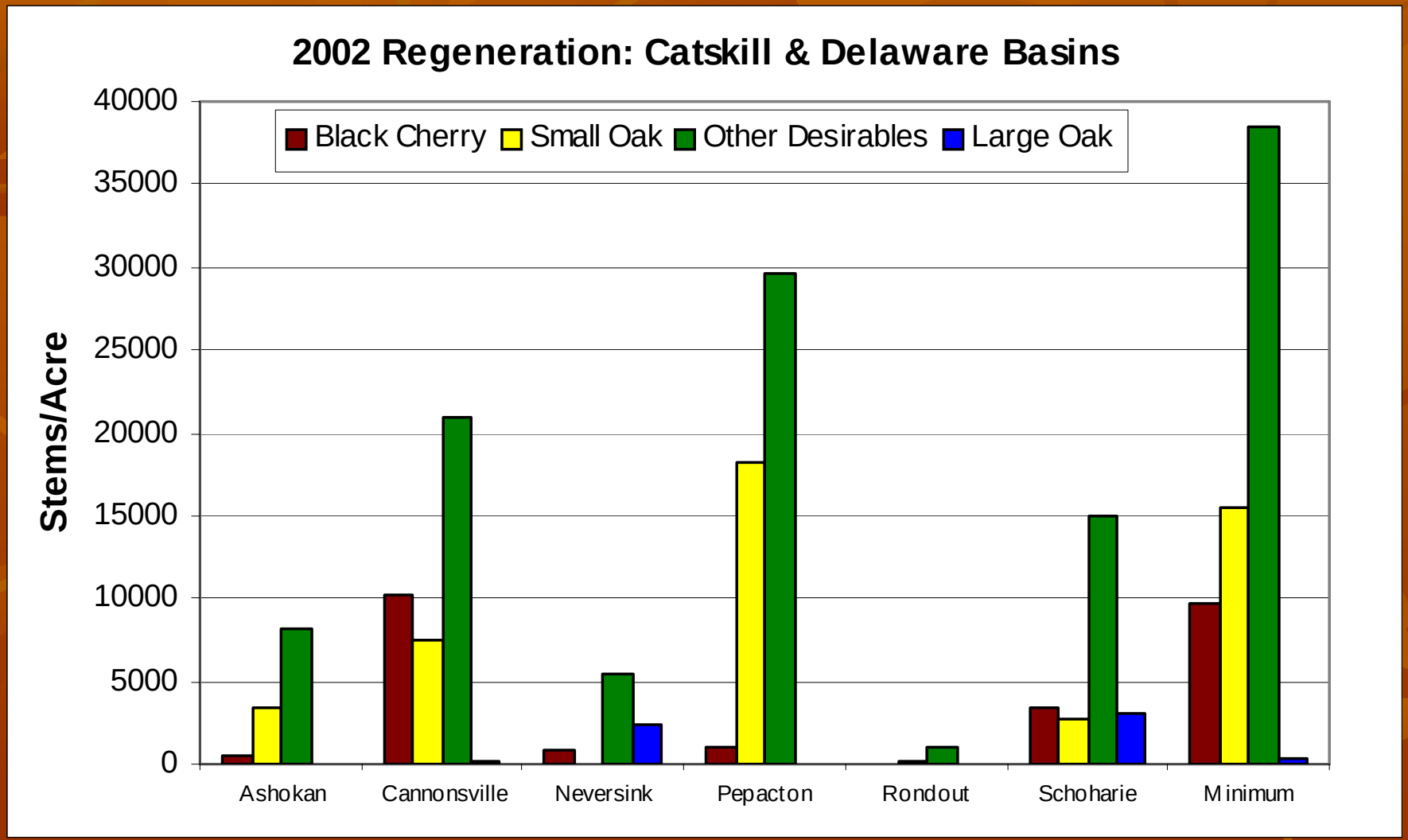
Economic Impacts of 480-a

- **Based on a 2003 watershed tax study:**
  - ~ 8% of eligible land is enrolled in 480-a
  - Cat/Del watershed towns: 480-a tax shift is approximately $660,000 (est.)
  - Cat/Del watershed counties: $2.7 million (est.)
- **2004 Legislative Reimbursement:**
  - $100,200 (3% of state-wide $3.3 million) for 10 watershed towns & 3 school districts

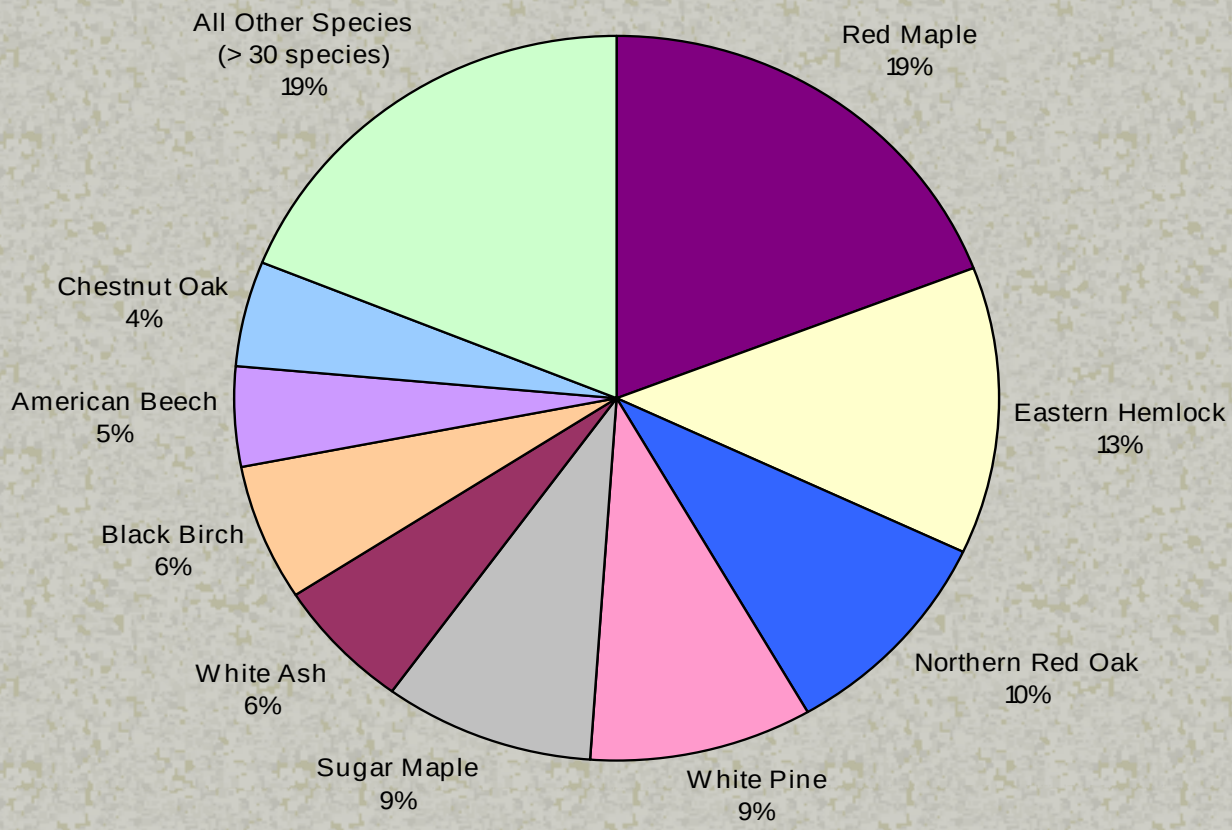
DEP FOREST MANAGEMENT

- GOALS
  - Maintain optimal “forest filter” as part of the water supply infrastructure.
  - Create a vigorous and diverse buffer to withstand the challenges of time.
  - Support the industry that open land depends on.
  - Invest in ecological functionality which provides ecological services and community benefits

Current Regeneration Data

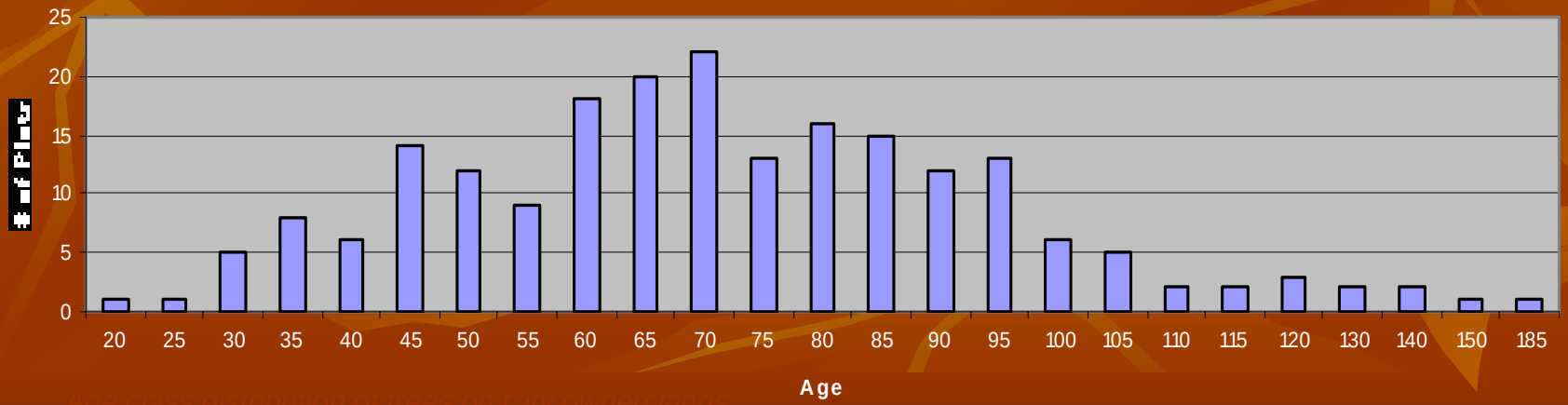


SPECIES COMPOSITION



Why do we cut trees on City lands?

- Aging forest is liability, risk, and opportunity
- Younger and older trees to balance forest structure
- Species diversity maintained or enhanced
- Focus on regeneration, stand improvement and water quality
- Wood ‘by-product’ supports industry alternative to development
- Land infrastructure improvements (woods roads, culverts)



Age class distribution of trees on City owned lands

DEP Forest Management

- Timber Sales
- Forest Stand Improvement
- Maintenance
- Stream Projects
- 5 Active Projects in 2004
- 790,000 board feet/ 2500 cords
- Marked and Bid by DEP Foresters
- Work Done by Local Logging Companies

How are we improving our approach to forest management?

Blowdown at Neversink West, 2003

- Staff commitment to forestry
- Draft Forest Management Strategy
- Basin Management Planning
- Reactive to natural disturbances
- Outreach / Demonstration
- BMP use and practice
- Links to water quality, recreation, prop mgt, water supply

INTENDED RESULTS

- Rural Land Use Pattern
- Protected Sensitive Land
- Environmental Infrastructure
- Multiple Barrier Protection
- Local Capacity for Stewardship
- Peer to Peer Implementation and Education
- Multiple Objectives Addressed

TIMELINE

Life of a Water Supply

- 5 Year Evaluation in 2002 (City, State, WPPC)
- New FAD Developed through 2007
- Included Continuation/Enhancement of Programs
- Next 5 Year Evaluation 3/06

www.nyc.gov/dep