

Knowledge Versus Implementation:

The Adoption of Forestry BMPs by NIPF Owners in the Catskill/Delaware Watershed

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Objectives

- Assess the current state of forestry BMP awareness, knowledge and implementation among Watershed NIPF owners
 - Formative Evaluation: a type of research that is conducted while an activity is ongoing to gain helpful insight
- Two main areas for investigation:
 1. Knowledge
 2. Implementation

New York City's Water Supply

- Catskill/Delaware systems - 1,625 square miles; 45,000 full-time residents
 - supply 90 percent of NYC's total water supply
- The older and suburbanized Croton system - 375 square miles; 160,000 residents
 - supplies about 10 percent
- The Watershed supplies 9 million people in the greater NYC area, plus another one million tourists and commuters each year





The Working Watershed

- NYC water supply system is largest surface storage watershed in the country
- Throughout the greater part of the 20th Century, NYC residents benefited from among purest sources of drinking water in the nation
- As we enter the 21st Century, changes in land use and development threaten the quality of the NYC's water supply

What makes this case study unique?

- Other big cities with unfiltered surface water supplies – Seattle, San Francisco, Portland, Boston – own/control most land in their water systems
- 75% of the Watershed is forested; 75% of forestland in private hands
- Major player: nonindustrial private forestland owner (NIPFO)

Maintaining High Quality Water

Mandate from the EPA

- In 1989, the EPA promulgated the Surface Water Treatment Rule pursuant to the Federal Safe Drinking Water Act Amendments of 1986
- Required that all surface drinking water sources must be filtered (unless managers can control human activities, watershed contaminants)
 - New filtration plant will cost an estimated \$8 billion
 - Annual operating costs of \$300 million

Comprehensive Watershed Management Plan

- To avoid filtration, NYC released a draft watershed protection plan in September 1990 that included revised watershed regulations which had not been updated since 1953
- The draft regulations sparked opposition from Watershed communities, especially farmers and the local forest products industry
- Seven years of negotiations began among stakeholders

Challenge:

Protect water quality at its source
when most Watershed residents,
at best, distrust, at worse, hold
animosity, for NYC.

Historic Watershed Agreement

- 1997 NYC Watershed Memorandum of Agreement (MOA) signed by NYC, State and Federal agencies, watershed communities and environmental groups
- Agreement enabled NYC Department of Environmental Protection to receive a long-term waiver with regards to the federal requirement of a filtration plant
 - Filtration Avoidance Determination

Estimated Price Tag: \$1 – 2 billion

- Land acquisition (fee simple and easements)
- Updating sewage plants
- Constructing new storm sewers and septic tanks
- Subsidizing Best Management Practices on farms and in forests
- Economic development consistent with water quality protection

Watershed Forestry Program

- Based on premise that a well managed, working forested landscape provides the most beneficial land cover for water quality protection
- Program seeks to minimize non-point source pollution related to forestry activities by promoting
 - Forest management planning
 - Implementation of Best Management Practices (BMPs)
 - Extension efforts focus on logger training, landowner outreach and continuing education for foresters

Research Question

“How much do NIPF owners in the watershed know about BMPs and are they implementing them?”

Theory Base: Diffusion of Innovation

- History:
 - Beginnings in agriculture
 - Spread throughout multiple disciplines
 - Over 4,000 publications to date
- Definition:
 - The process by which an *INNOVATION* is *COMMUNICATED* through certain channels over *TIME* among the members of a *SOCIAL SYSTEM* (Rogers, 1995)

Awareness/Knowledge – Persuasion – Decision – Implementation

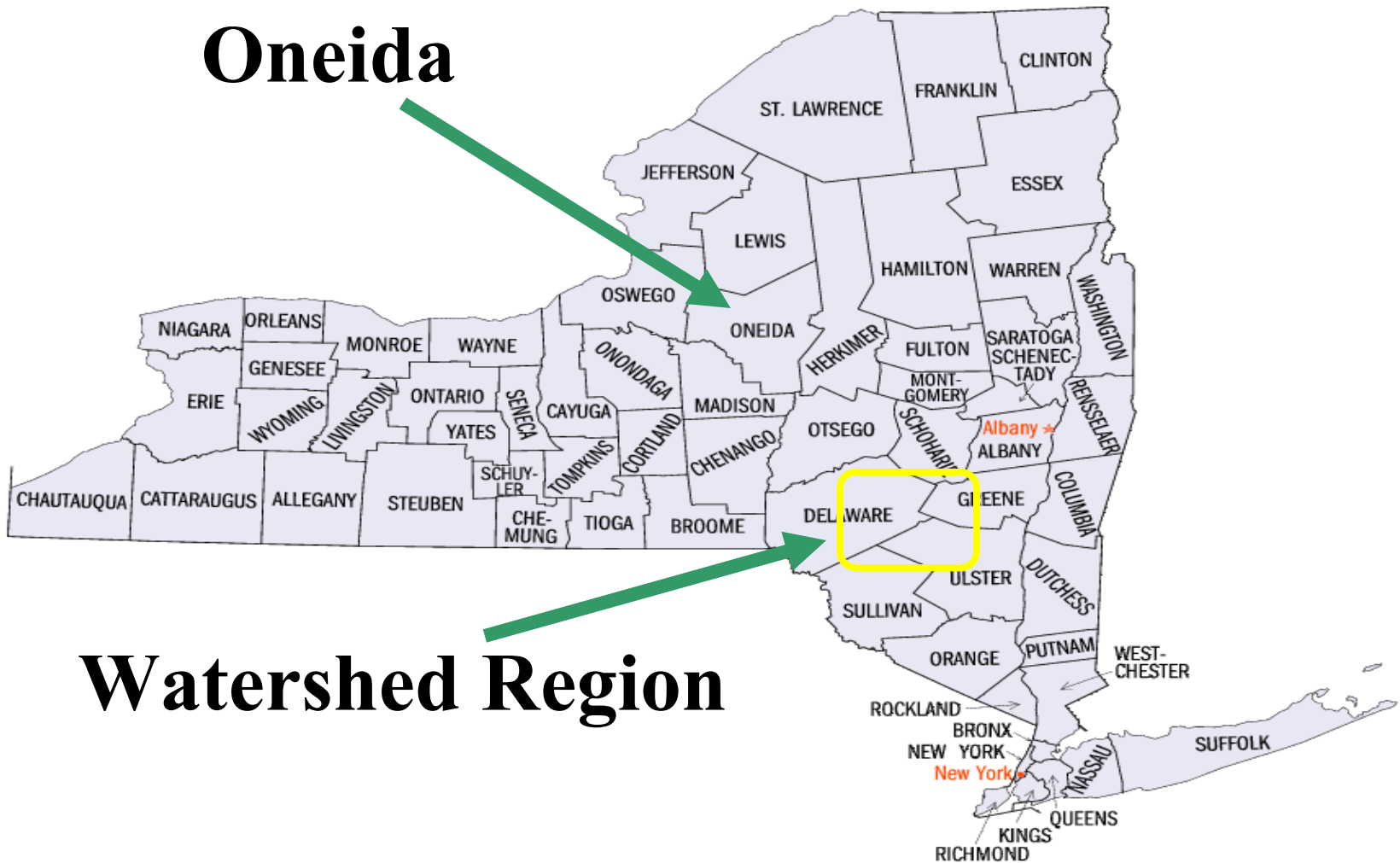
Design

- Two phase Design
 - 1) Mail Survey
 - Awareness/Knowledge – Persuasion – Decision
 - 2) Field Survey
 - Implementation

- Comparative Study
 - Absence of Compatible Baseline Data
 - Oneida County serves as control
 - Forestry activity high
 - Outreach and Education activity low

Design

Oneida



Watershed Region

Mail Survey

Completed in Spring 2002

- 700 Mailed to Watershed
 - 645 Delivered
 - N=274 43%
- 115 Mailed to Oneida County
 - 108 Delivered
 - N=54 50%

Mail Survey Results

Knowledge

Scale = 1 to 6

Watershed mean = **4.14***

Oneida County mean = **3.19**

* Indicates significantly higher mean @ .05

Field Survey

- BMP implementation measured on:
 - On sites harvested within the past 3 years
 - Landings, Skid Trails, Forest Roads, Stream Crossings
 - 71% of NIPF owner respondents who harvested timber on their land in the past 3 years agreed to a field survey

- Development
 - Previous evaluations
 - NYS BMP field guide
 - Watershed Forestry Program and SUNY-ESF



Field Survey

- Scale = 0 to 3
 - 0 = BMP not applied
 - 1 = BMP attempted with major deviations
 - 2 = BMP implemented with minor deviations
 - 3 = BMP used and working correctly
- Census of harvest site
- 31 surveys in the Cat/Del Watershed
- 13 surveys in Oneida County



Field Survey Results

Implementation

Scale = 0 to 3

Watershed mean = **1.7**

Oneida County mean = **1.6**

(no significant difference at .05)

Important Note: Implementation means would have been near zero for water diversion devices in both study regions (i.e. waterbars, broad-based dips, diversion ditches)

Making Connections

- Participation in outreach and education increased Knowledge and the use of management plans
 - 20% NIPF owners in Watershed have management plans (Munsell and Germain 2004)
- BMP Implementation means were higher on properties with a written forest management plan

Discussion

- Why does NIPF Knowledge fail to coherently lead to Implementation?
 1. BMPs: A Preventative Innovation
 2. Economic Implications
 3. Forest Management Triangle

Implications

- Stronger emphasis placed on promoting management plans and consistency in implementation
 - Watershed Forestry Program conducting follow-up survey of NIPF owners with management plans to verify follow through activities
- Research needed:
 - to understand the roles of the other two groups in the forest management triangle – foresters and loggers
 - to further understand the factors affecting NIPF owners (ecological context)

Questions?

With BMP

Without BMP