RETURN ON ENVIRONMENT

What Is Nature Worth?

Jeanne Barrett Ortiz, Audubon Pennsylvania

Funding assistance has been provided by Pennsylvania's Department of Conservation and Natural Resources, as well as several other organizations.

WILLIAM PENN FOUNDATION

Foundation for Pennsylvania Watersheds

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pennsylvania DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

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WHY

- Assumption is the value of nature is $0.00 and infinite
- Everyone understands money
- 2015 White House Executive Memorandum
- Constitutional right

Article I, Section 27 of the Pennsylvania Constitution provides as follows:

"The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and aesthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including *generations yet to come*. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people."

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October 7, 2015

M-16-01

MEMORANDUM FOR EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Shaun Donovan, Director
Office of Management and Budget

Christina Goldfuss, Managing Director
Council on Environmental Quality

John Holdren, Director
Office of Science and Technology Policy

SUBJECT: Incorporating Ecosystem Services into Federal Decision Making

some ecosystem services. An ecosystem-services approach can: (1) more completely inform planning and decisions, (2) preserve and enhance the benefits provided by ecosystems to society, (3) reduce the likelihood of unintended consequences, and, (4) where monetization is appropriate and feasible, promote cost efficiencies and increase returns on investment. Adoption of an ecosystem-services approach is one way to organize potential effects of an action within a framework that explicitly recognizes the interconnectedness of environmental, social, and, in some cases, economic considerations, and fosters consideration of both quantified and unquantified information. This memorandum sets a course to implement this approach.

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Sprawl

Stormwater

Chemicals

Flooding

Forest fragmentation

Large lawns

Air pollution

Invasive plants

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Return on Environment: Avoided Natural System Services Costs

Stormwater and flood mitigation, nutrient uptake, erosion prevention, pollination, biological control, carbon sequestration, air pollution removal, wildlife habitat

<u>Methodology:</u>

- Peer reviewed studies
- Regulatory fines
- Nutrient trading
- Forest replanting
- Habitat replacement costs
- Tax benefits
- Conservation easement values
- i-Tree model (air pollution)

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Return on Environment: Recreation

Performed in natural settings without causing harm

Not tourism

<u>Methodology:</u>

- IMPLAN
- Change in overall economic activity as a result of change in one or several specific economic activities
- Jobs, income, retail sales, tax revenue

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Return on Environment: Avoided Healthcare Costs

Due to outdoor exercise, e.g. like walking, jogging, fishing, camping

Asthma

<u>Methodology</u>

- DCNR outdoor recreation rates applied to study findings

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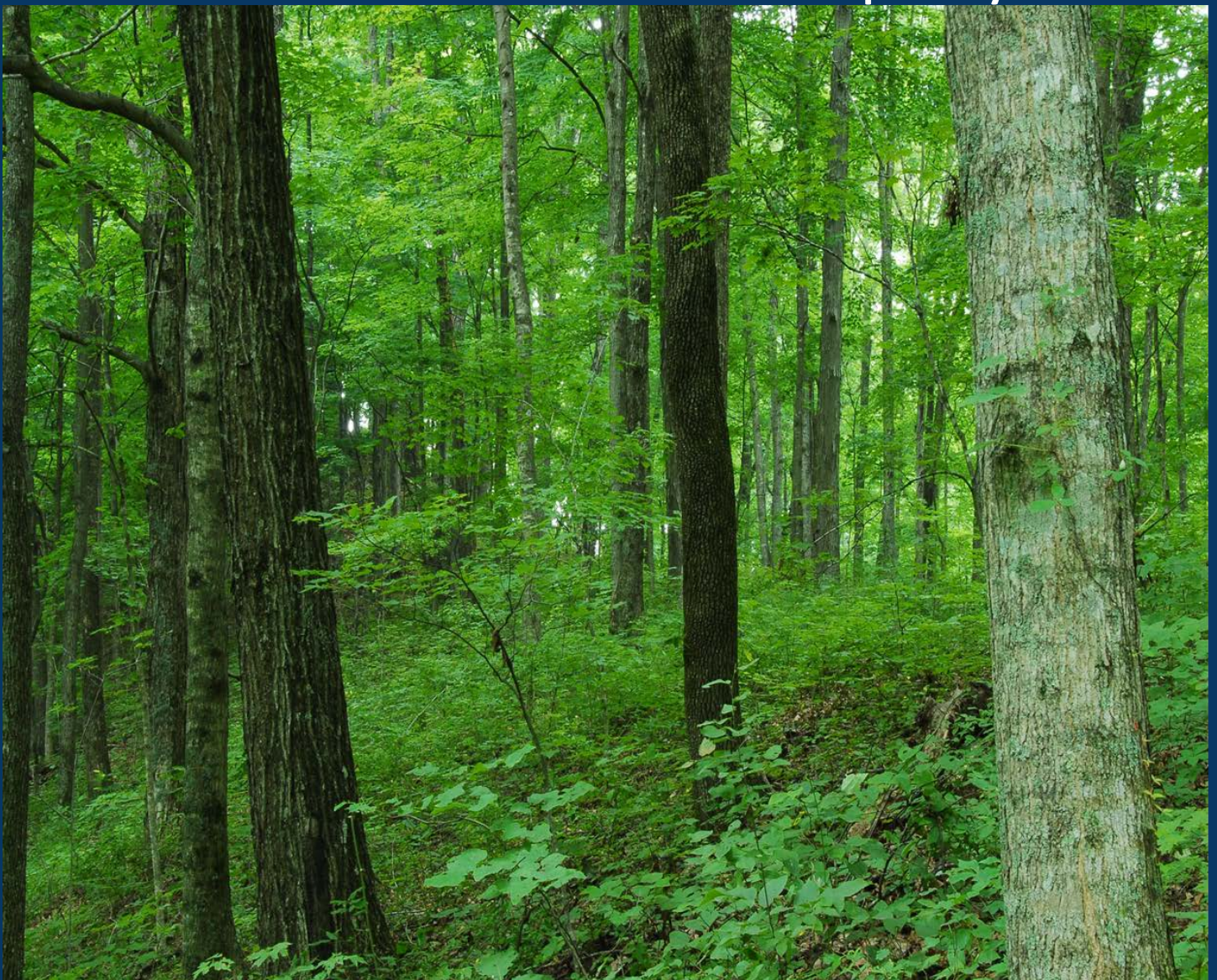
Return on Environment: Property Value



Increased value of real estate due to proximity to open space or clean water

<u>Methodology</u>

Averaged assessed value of single-family homes located adjacent to protected open space

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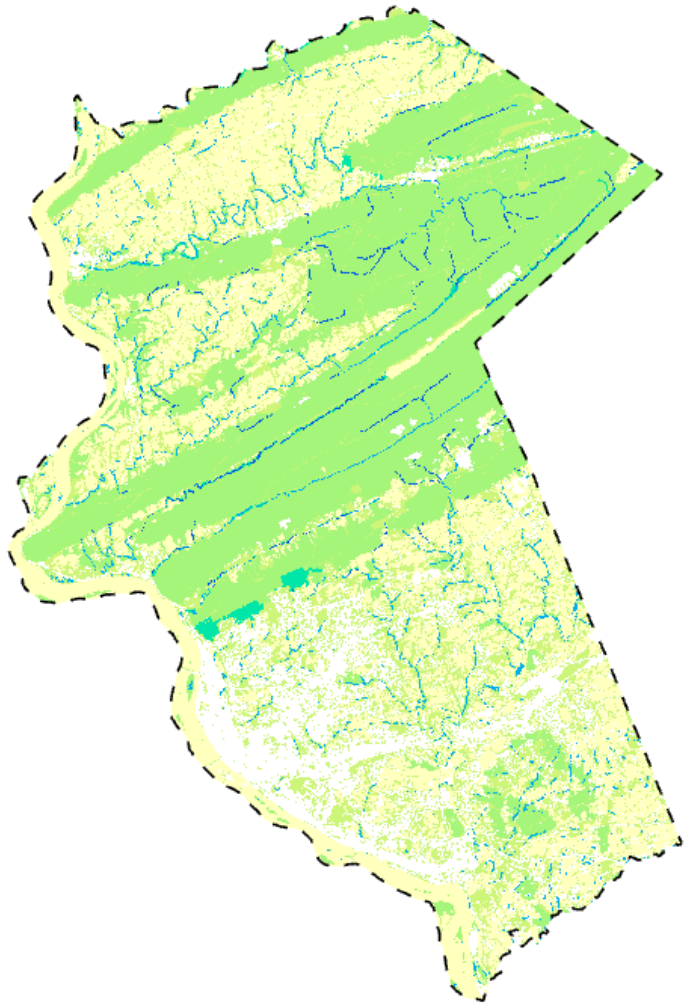
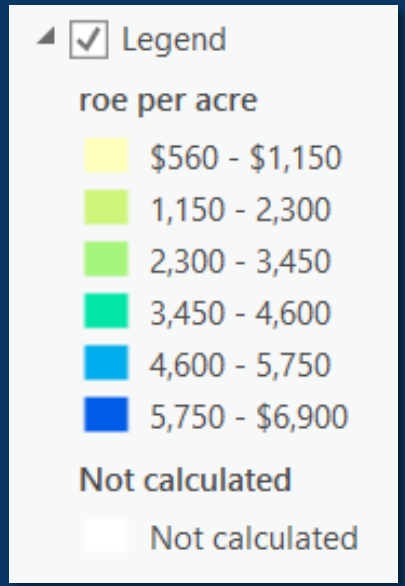
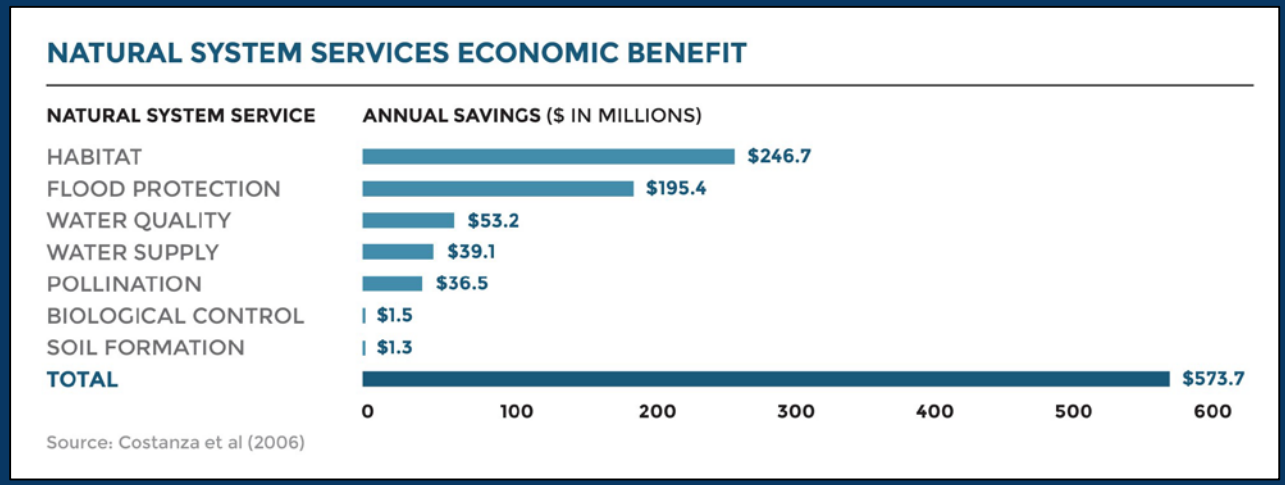
Return on Environment: Dauphin County







Return on Environment: Benefit to 319

- Strategy and Decisionmaking
  - ✓ Which areas to restore
  - ✓ Which areas to preserve
  - ✓ Project selection, A vs. B
  - ✓ Comprehensive look
  - ✓ Track economic impact

Calculating the value of preservation; cheaper to prevent degradation

Engage partners

Engage officials

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Return on Environment: Carbon County

Kathy Henderson,
Director
Economic Development

County Commissioners

Engineers

COG

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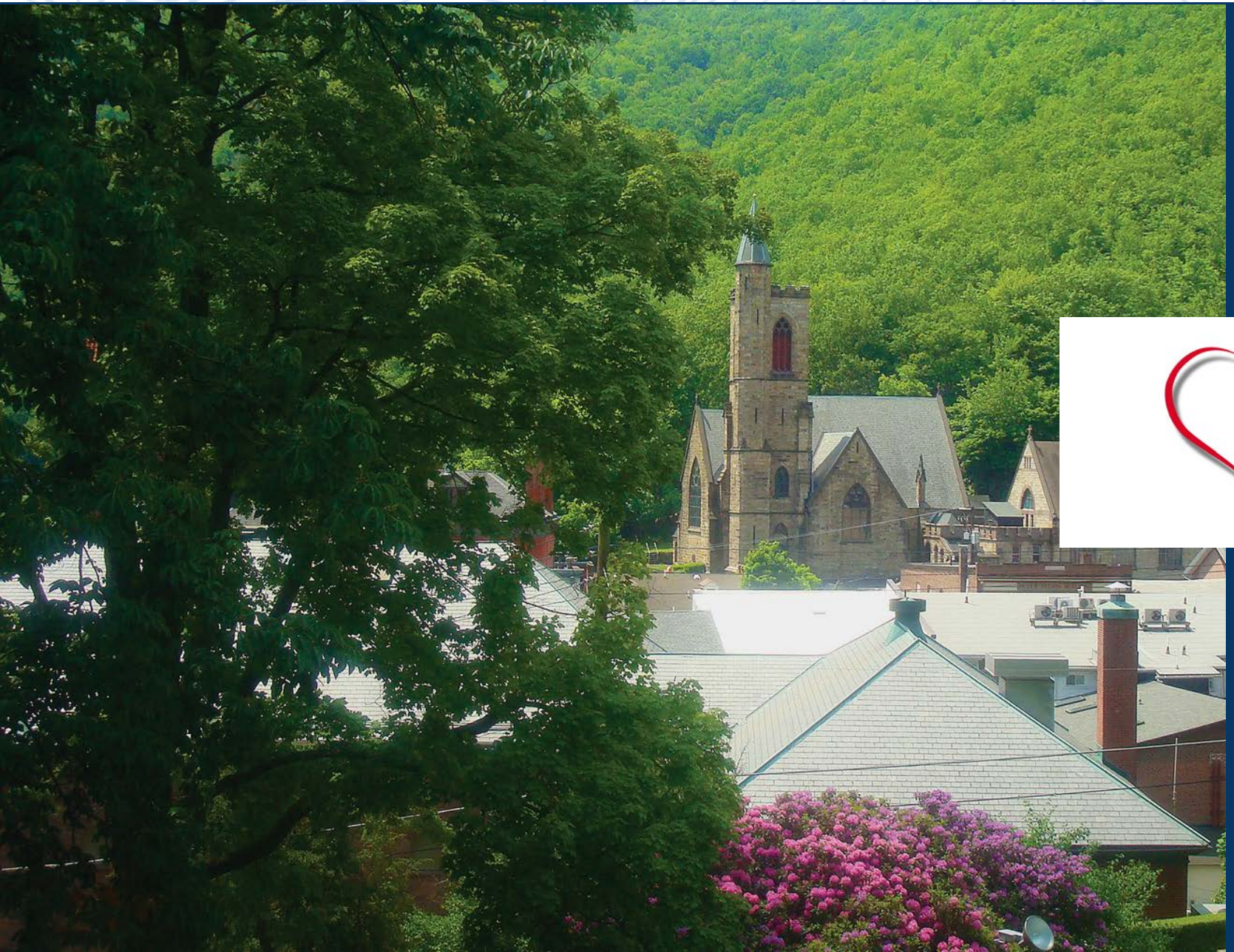

- Native plant nurseries
- Riparian easements (Tier 1: $3000, Tier 3: $6500)
- Not a silver bullet/last line of defense
- Upland BMPs
- Wildlife corridors
- Health: stress reduction, mental focus, herd health

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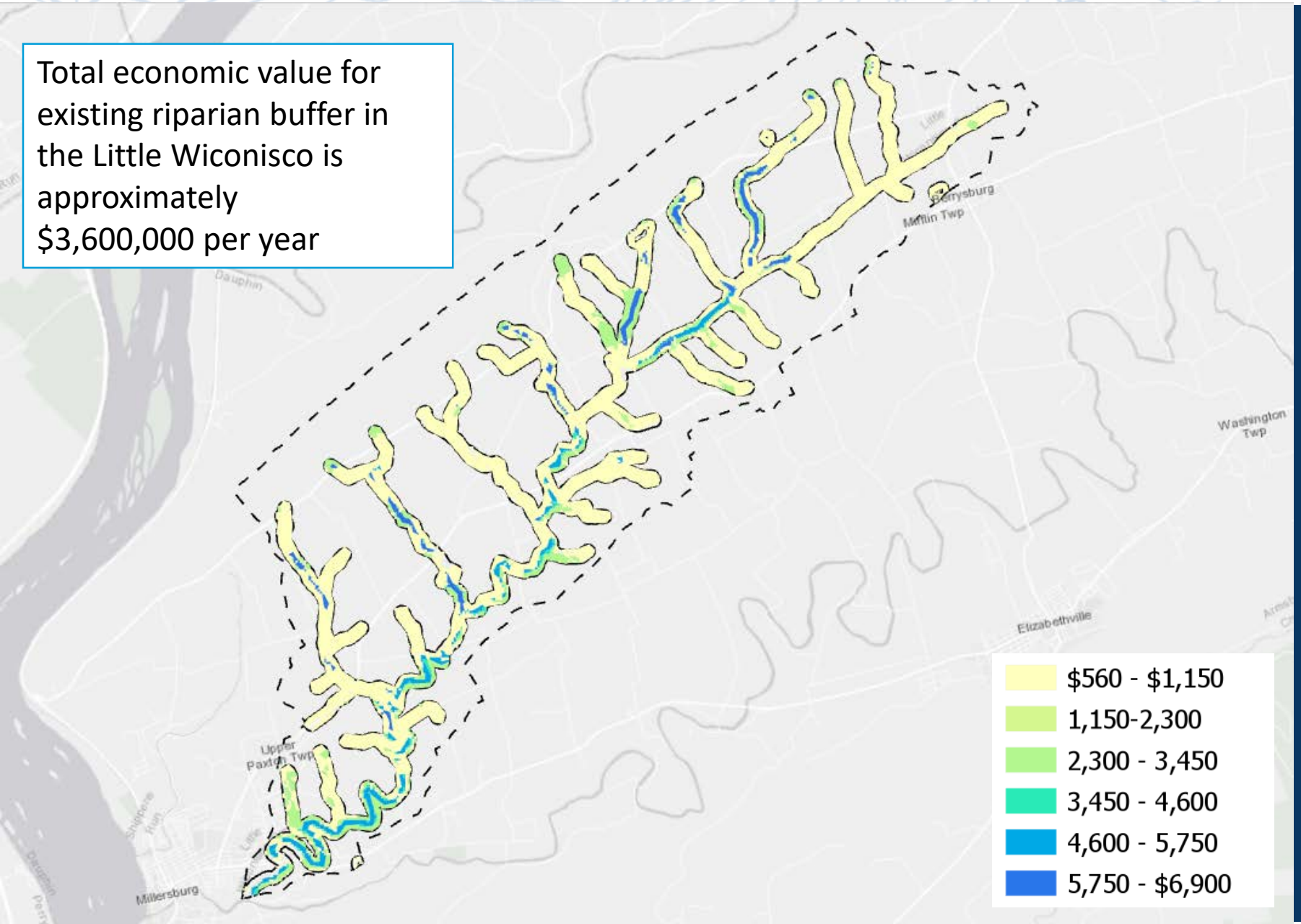
Total economic value for existing riparian buffer in the Little Wiconisco is approximately $3,600,000 per year



RESTORE, RECONNECT, AND EXPAND EXISTING BUFFERS

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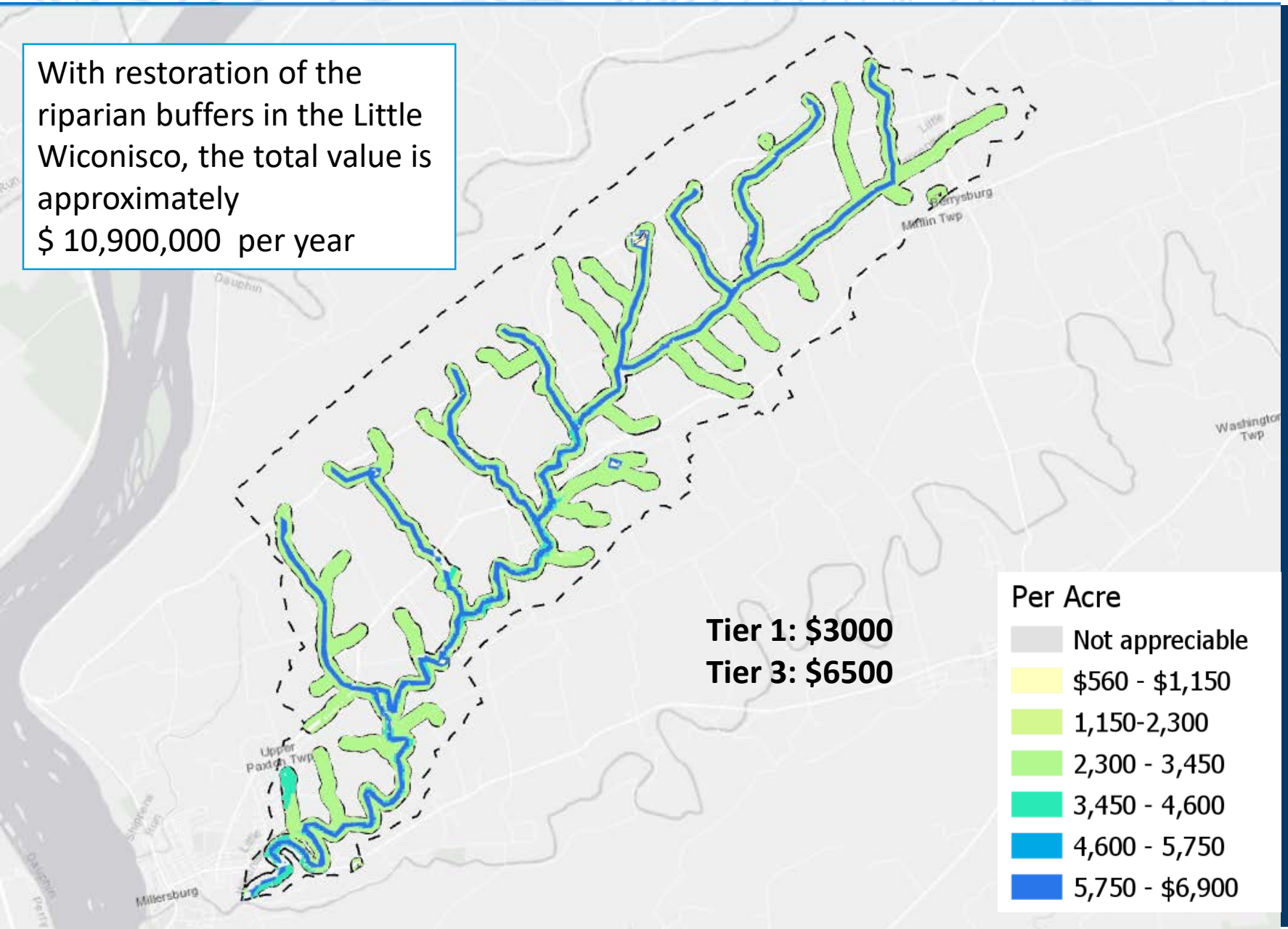
With restoration of the riparian buffers in the Little Wiconisco, the total value is approximately
$ 10,900,000 per year



RESTORE, RECONNECT, AND EXPAND EXISTING BUFFERS

STRATEGIC ACTIONS

- Incorporate Return on Environment into all decision making
- Prioritize areas to protect and restore
- Develop tool to evaluate benefits *and costs* of all new development
- Connect and expand open spaces
- Teach good stewardship to landowners
- Create resource protection
- Involve schools and learning centers
- Assist sustainable business

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Sample Approach to Estimating Value

Ecosystem Service	Human Benefit	Biometric Units	Units	Return on Environment Value
Removal of sediment from surface water	Cleaner drinking water	Tons of sediment removed per acre of wetland	Dollars per ton (benefit of removal or avoided cost)	$650 / acre
Removal of particulates from air	Fewer asthma cases	Asthma cases avoided per metric ton of removed particulate per acre of forest	Dollar value of asthma case avoided	$4 / acre
Support for pollination	Supports agriculture and biodiversity	Square feet of blueberry bee habitat serviced for acre of meadow	Dollars per acre of blueberry plants supported	$75 / acre
Support wildlife	Hunting enjoyment and food	Numbers of whitetail deer supported per acre of forest	Dollars generated in hunting fees per unit	$15 / acre

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Land Covers Provide Multiple Benefits

Land cover type	Groundwater Recharge	Sediment removal	Pollination	Greenhouse gas removal	Sum of Individual Benefits
Cropland	$115	$6	4	0	$125
Large forests	450	225	20	10	687
Medium forests	425	190	35	12	662
Urban wetlands	950	450	15	40	1455
Rural wetlands	712	225	8	20	965
Riparian buffers in headwater regions	600	800	32	12	1444
Other riparian buffer zones	$500	300	12	8	$820

Values shown are examples only; see ROE reports for actual values. All values are dollars per acre