



Audubon | PENNSYLVANIA

Jeanne Ortiz
Senior Program Manager
Landscape Conservation



- 185 miles long
- Global Important Bird Area
- 160 miles Appalachian National Scenic Trail
- Provides clean water for residents, businesses, and recreation

RETURN ON ENVIRONMENT

What is nature worth?

How do we use the results?



INVOICE

Mother Nature

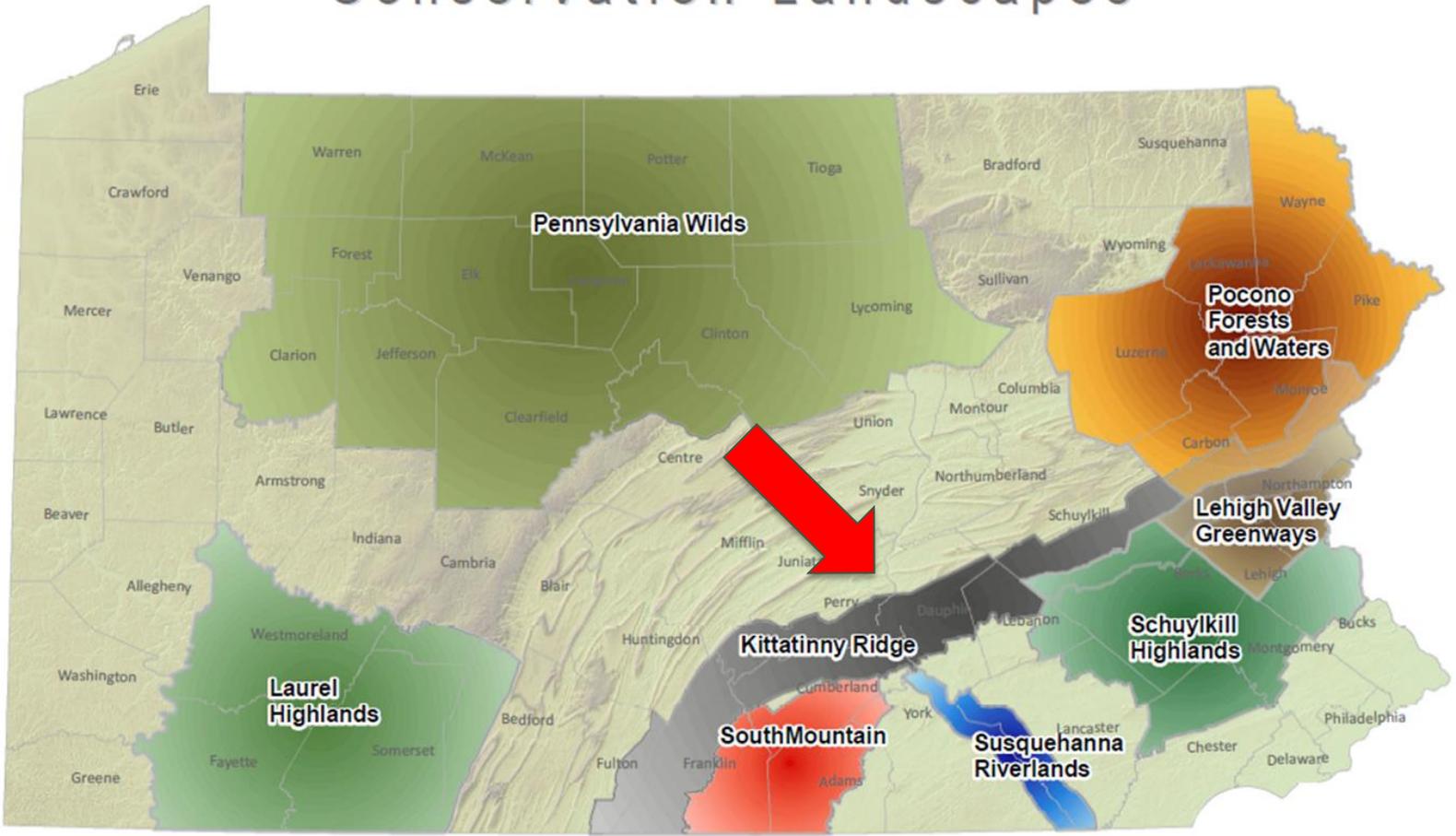
Taking Care of Humans Since the Beginning

DESCRIPTION OF SERVICES

Ecosystem services provided by one (1) woodland area located at 39°15'42" N, 78°23'18W, 4.3 acres in size. Mixed deciduous and evergreen forest, primarily mature vegetation comprised of white oak, sweet gum, and hickory, with selected understory trees, and ground covers. Services provided 1-Jan through 31-Dec.

SERVICE	DESCRIPTION	UNIT PRICE / ACRE	TOTAL
		\$1,800	\$7,740
1)	Groundwater recharge and runoff minimization, 24/7/365	200	860
2)	Flood avoidance downstream	125	537.5
3)	Erosion control	5	21.5
4)	Removal of particulates from air	2	8.6
5)	Habitat provision for white tail deer, various bird and bat species	4	17.2
6)	Pollination support	17	73.1
7)	Canopy cover (climate attenuation)	\$6	25.8
8)	Removal of greenhouse gases		\$9,210.60
	SUBTOTAL		\$552.64
	TAXES DUE		\$9,763.24
	TOTAL DUE		

Conservation Landscapes



KITTATINNY RIDGE CONSERVATION LANDSCAPE

- Carbon
- Lehigh/Northampton (LVPC)
- Berks
- Lebanon
- Dauphin
- Perry
- Cumberland
- Franklin (in progress)

Landscape Name	Lead Contacts	Email
Laurel Highlands	Kathy Frankel	kfrankel@pa.gov
Lehigh Valley Greenways	Rob Neitz	rneitz@pa.gov
PA Wilds	Meredith Hill	mehill@pa.gov
Pocono Forests and Waters	Tim Dugan and Christine Dettore	tdugan@pa.gov and cdettore@pa.gov
Schuylkill Highlands	Drew Glichrist	dglichrist@pa.gov
South Mountain	Mike Eschenmann	meschenman@pa.gov
Susquehanna Riverlands	Lori Yeich	lyeich@pa.gov
Kittatinny Ridge	Kristen Hand	khand@pa.gov



Average
County ROE

\$1 billion/year



How has ROE been used?

- Prioritize parcels for protection
- Fund open space protection
- Planning
- Engage residents
- Guide municipal officials training



CARBON COUNTY RETURN ON ENVIRONMENT 2018



Funding assistance has been provided by the Department of Conservation and Natural Resources, Bureau of Recreation and Conservation, Environmental Stewardship Fund.



**IT IS DIFFICULT TO HAVE A STRONG
ECONOMY WITHOUT A HEALTHY
ENVIRONMENT, PLENTY OF OPEN SPACE,
AND QUALITY HABITAT. THE KITTATINNY
RIDGE DOES AN EXCELLENT JOB
OF PROVIDING ALL THREE.**

John Rodgers / Keystone Conservation Trust

01.

NATURE IS ONE OF CARBON COUNTY'S MAJOR COMPETITIVE ADVANTAGES



Photo: Mark Zakutansky

More than just pretty places, Carbon County's forested ridges and stream valleys are productive assets that generate over \$800 million annually in avoided costs for natural system services and air pollution removal, revenues from outdoor recreation and local and state taxes, and increased tax revenues from real estate premiums.

ANNUAL AVOIDED COSTS

(Dollars that do not need to be spent on the provision of environmental services, such as stormwater management and air pollution removal.)

- Natural system services: \$652.4 million
- Air pollution removal impact on health: \$7.9 million

OUTDOOR RECREATION ANNUAL REVENUES

- Outdoor recreation: \$108.8 million
- Jobs: 823
- Economic output: \$26.5 million
- State and local taxes: \$5.1 million

OPEN SPACE IMPACT ON PROPERTY VALUE

- \$14.4 million in added annual property tax revenue from properties in proximity to water

02.

NATURE IS SERIOUS BUSINESS



Photo: Mark Zakutansky

The economic benefits presented in the Return on Environment report are a new way to provide government officials, businesses, and residents with a perspective on the value of natural system services, and should contribute to informed decisions concerning land use, tourism, economic development, infrastructure, tourism, and recreation.

RETURN ON ENVIRONMENT VALUATION BENEFITS

- Nature's complex system is conveyed in a simple bottom line everyone can understand - \$\$.
- Results directly establish nature's connection to quality of life, health, cost of living, economy, and sense of place.
- Informs local policy and decision making:
 - Conveys a level of significance or priority
 - Engages stakeholders in an educational process
 - Can be applied to land use, tourism, economic development, infrastructure, and recreation.
- Mapping of natural system service values can help make land use decisions explicit to policymakers, investors, and residents.

03.

CARBON COUNTY IS IN TRANSITION



Photo: Mark Zakwansky

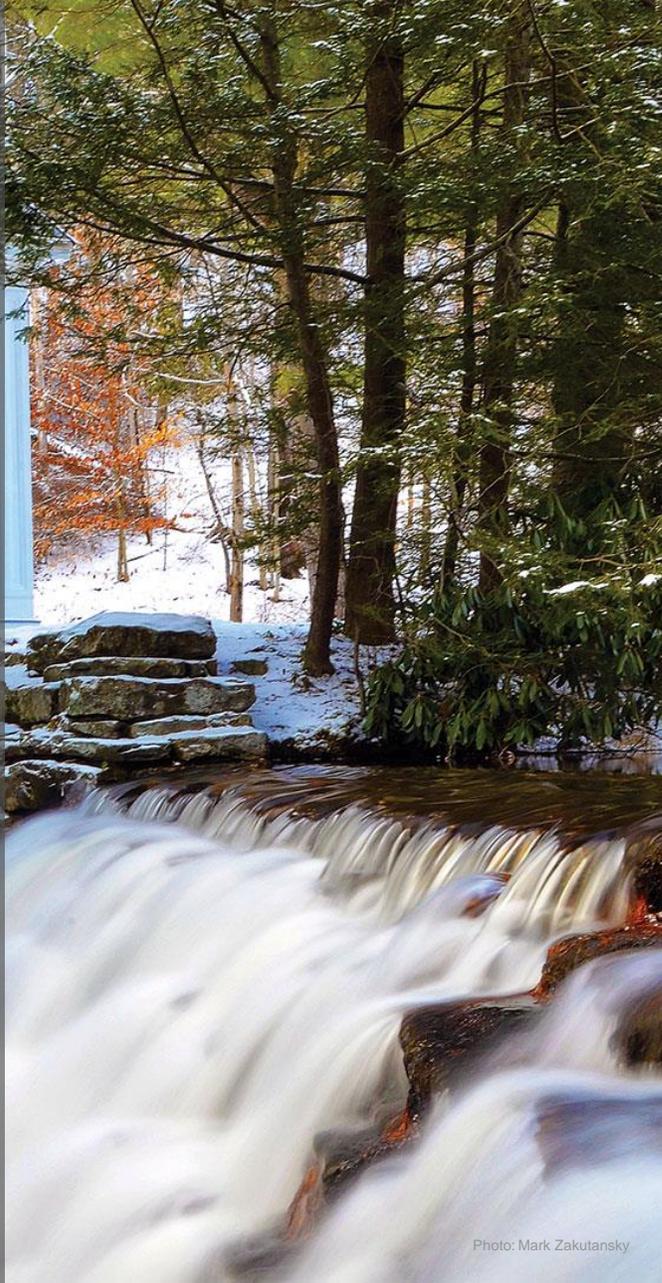
Over the next 20 years, the interests of aging adults and millennials will drive economic growth.

TRENDS THAT WILL IMPACT CARBON COUNTY'S FUTURE

- Changing demographics
- Growth in nearby areas
- Increased demand for outdoor recreation
- Interest in healthy lifestyles and adventure experiences
- Investments in water quality
- Agriculture needs
- Internet access
- Changing forms of business
- Changing climate conditions

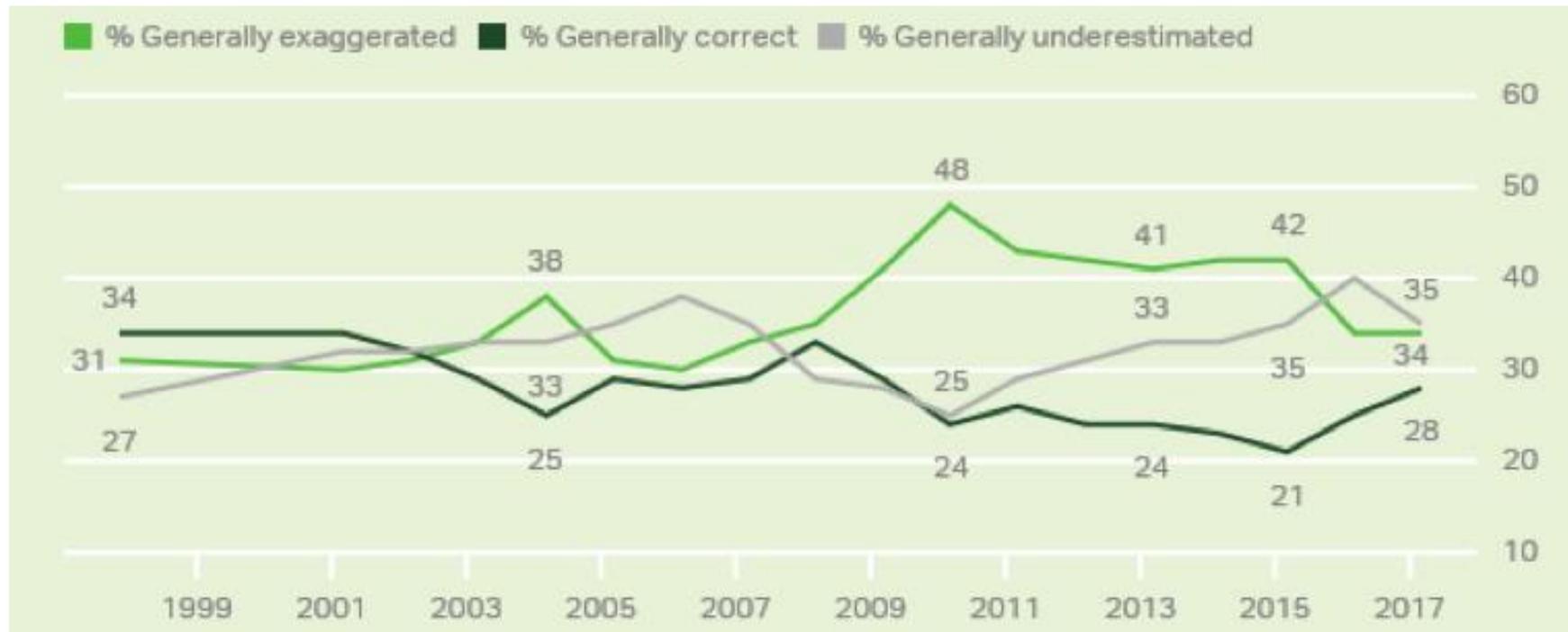
04.

ATTITUDES TOWARD THE ENVIRONMENT ARE CHANGING



Over the past 30 years, national polls conducted by Gallup, Inc. have shown a changing attitude toward the environment over economic development.

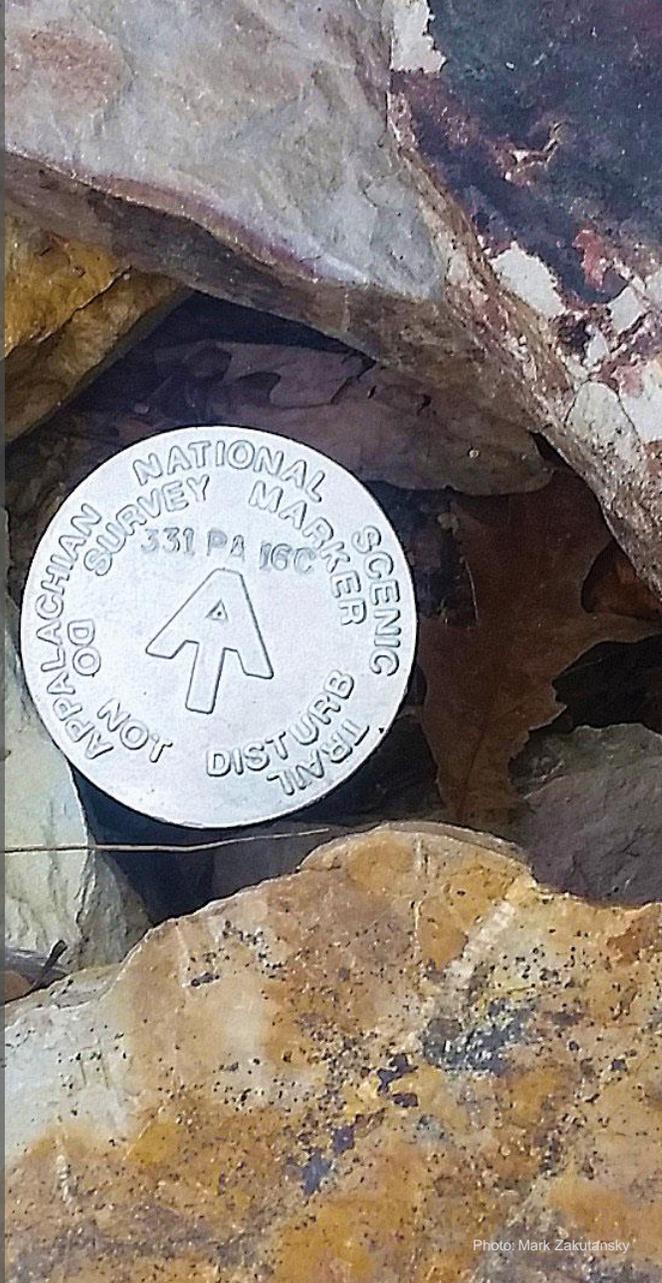
IS THE SERIOUSNESS OF GLOBAL WARMING GENERALLY EXAGGERATED, GENERALLY CORRECT, OR GENERALLY UNDERESTIMATED?



Source: Gallup

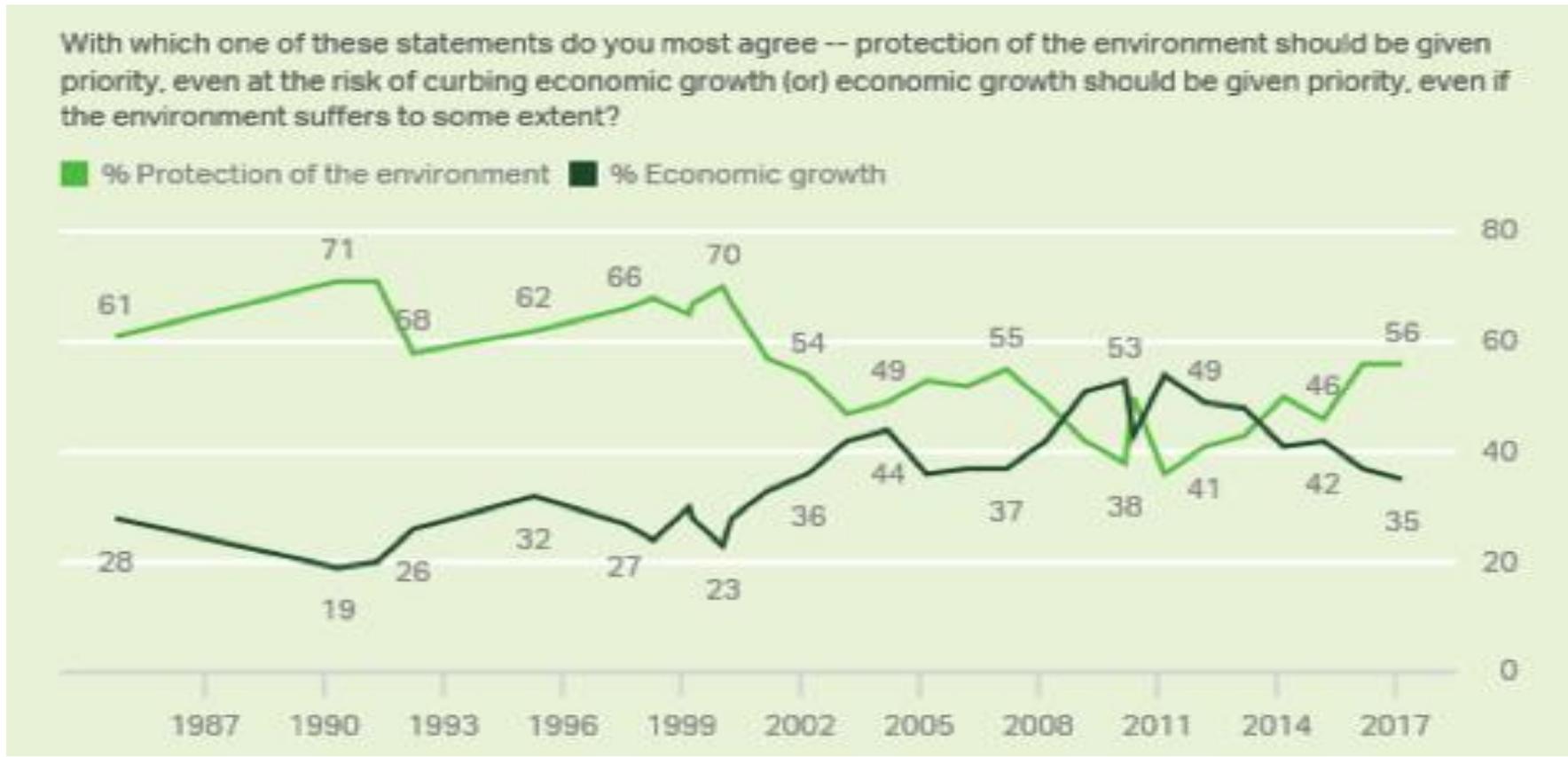
05.

THE USE OF LAND IS BY FAR THE GREATEST OPPORTUNITY TO MAKE MAJOR FINANCIAL CHANGES



Stormwater, flooding, air pollution, and forest fragmentation are some of the drivers of natural system service loss and disruption. The greatest financial leverage on open space and sustainable environmental and economic health is how land is used.

ENVIRONMENTAL PROTECTION VS. ECONOMIC GROWTH



Source: Gallup

06.

BIODIVERSITY IS CENTRAL TO MAXIMIZING NATURE'S ECOLOGICAL AND FINANCIAL VALUE



Native plants are the foundation for all life and control local biological diversity. They help drive natural system services like photosynthesis, pest control, pollination, erosion control, soil formation, water purification and the generation of oxygen, and clean air. Additionally, they support 29 times more biological diversity than non-native plants.

BEST WAYS TO SUSTAIN AND EXPAND NATURAL SYSTEM SERVICES

- Protect water quality at its source in headwaters and wetlands, and along riparian areas.
- Protect large forests, particularly on steep slopes, connect wildlife habitats, and maintain and restore tree canopy cover.
- Remove invasive plants by minimizing disturbance (edges, clearings) in natural areas.
- Remove obsolete dams to improve water quality and aquatic habitats.
- Minimize impermeable surfaces and limit turf grass to areas essential for recreation and landscape access.
- Practice good stewardship and incentivize the use of native plants in the landscape of commercial, government, and residential areas surrounding parks, preserves, riparian areas, and trails.

07.

DEMAND FOR OUTDOOR RECREATION MAY HELP ATTRACT FUTURE GROWTH



Photo: Courtesy Blue Mountain Resort

The outdoor recreation industry is strong and growing, generating \$646 billion annually in the United States. However, the demand for outdoor recreation in Carbon County is larger than the business capacity to meet it, and much of the retail business related to outdoor recreation leaks into surrounding areas.

INCREASING TRENDS IN OUTDOOR RECREATION PARTICIPATION

- Thirty-one percent of Pennsylvanians surveyed during the Pennsylvania Department of Conservation and Natural Resources 2014 Outdoor Recreation Participation Survey of Pennsylvania said they planned to spend more time outdoors.
- About half of the region's baby boomers plan to increase their outdoor activity, compared to 25 percent of their older counterparts.
- By 2025, millennials will make up 75 percent of the workforce, and these young professionals enjoy the outdoors and seek healthy and adventurous lifestyles.
- A 2015 report by the National Outdoor Foundation found that the following outdoor activities have been increasing: paddle sports, mountain biking, cross-country skiing, day hiking, bird watching, and bicycling.

08.

**WE CAN'T
AFFORD NOT
TO PROTECT
CARBON
COUNTY'S
OPEN SPACE**

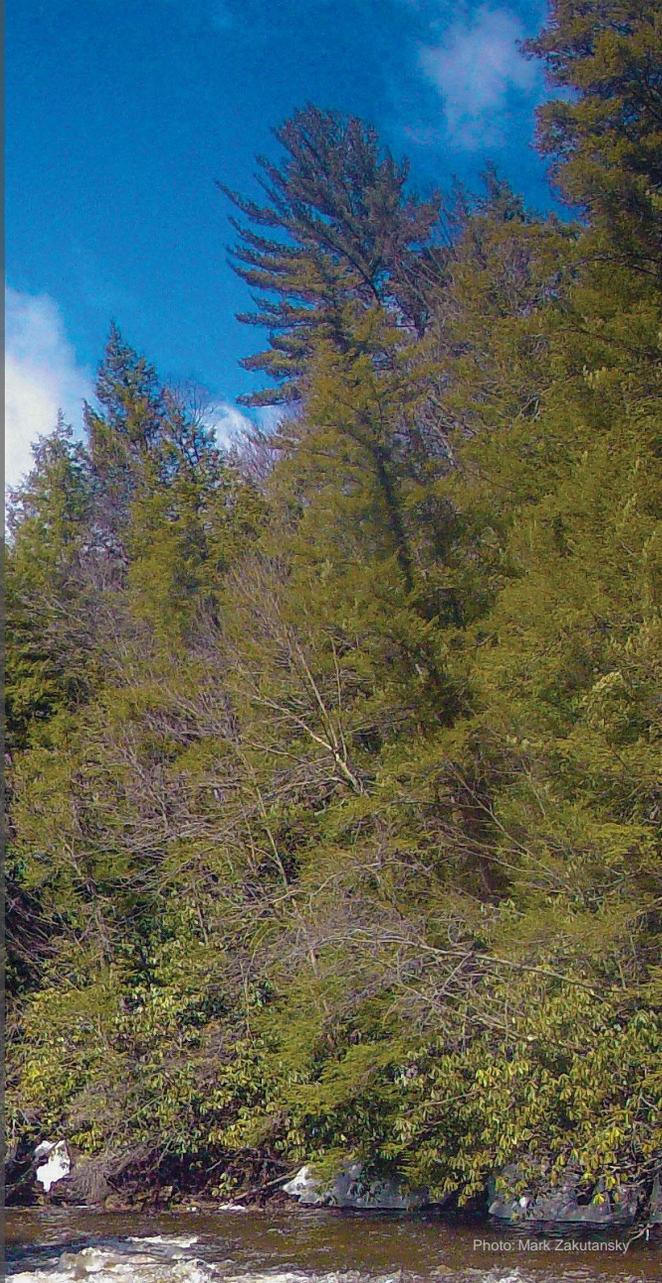
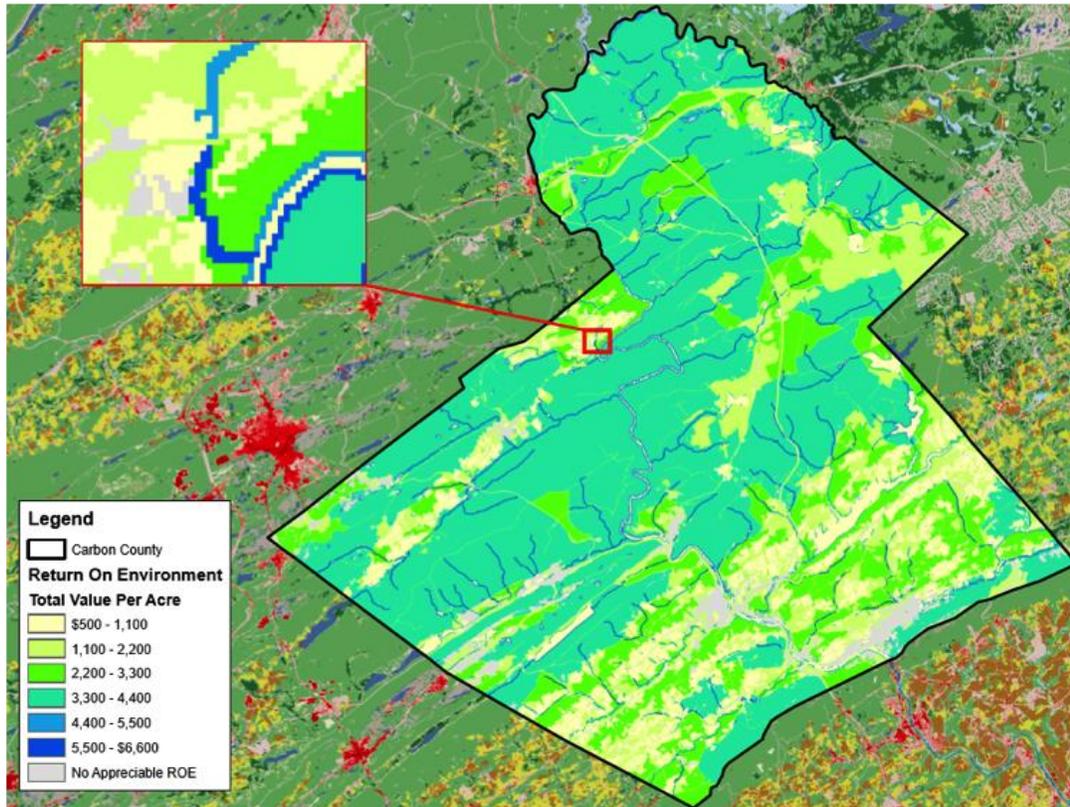


Photo: Mark Zakutansky

The first rule of ecology is that everything is connected to everything else. Whatever we do to natural habitats—good or bad, big or small—ripples through the economy. Simply stated, the loss of open space costs more than we know.

CARBON COUNTY'S LAND-COVER TYPES AND RETURN ON ENVIRONMENT VALUE



Forests	189,484
Developed open space	20,187
Wetlands	537
Croplands	5,631
Pastures	15,773
Water	5,432
Developed/urban	10,561
Total	247,605 acres

09.

PUT RETURN ON ENVIRONMENT STUDIES TO WORK



Businesses, governments, and households need to work together to manage open space in ways that result in the highest Return on Environment. Choices made about the environment today will have a dramatic impact on the future.

WAYS TO SUPPORT LOCAL EFFORTS

- Develop and implement strategies to reduce flooding and protect water quality.
- Expand, connect and protect habitat.
- Promote Carbon County as an outdoor adventure destination.
- Use the financial value of open space to make easement and land purchase decisions.
- Create incentives for stormwater management, riparian buffer restoration/expansion, and incorporating native plants (e.g., free trees).

10.

ALL STAKEHOLDERS PLAY A PART

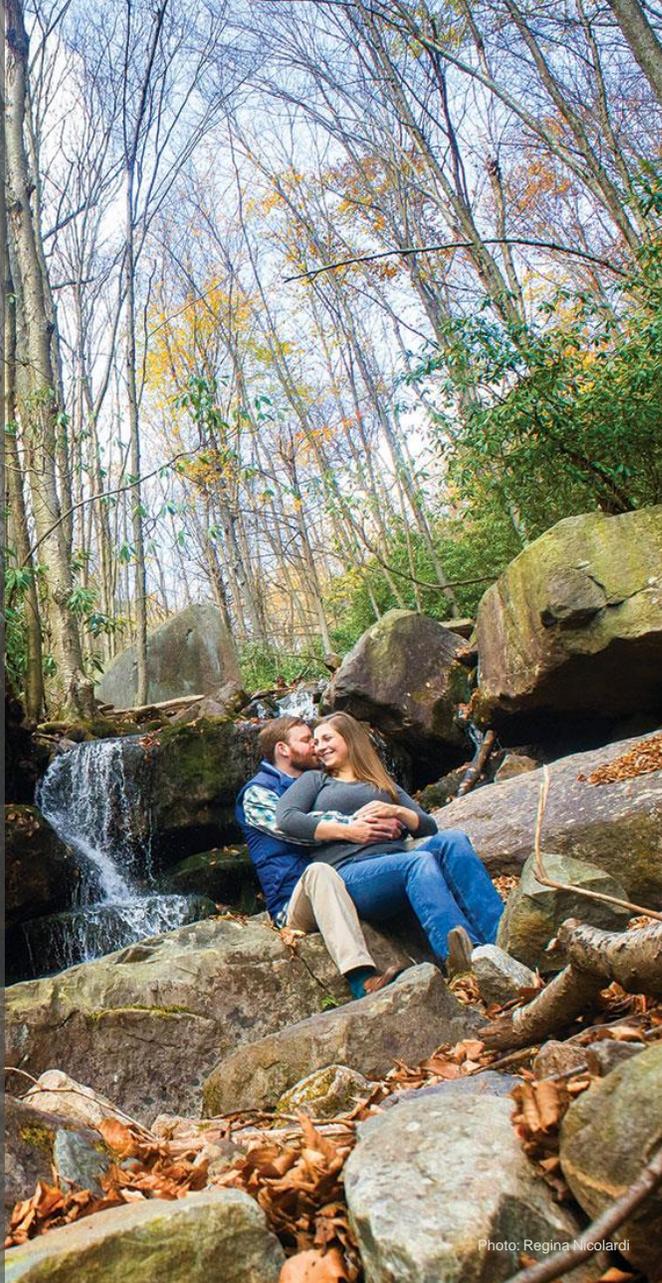


Photo: Regina Nicolardi

If the economy of Carbon County is to remain strong, environmental stewardship cannot be the responsibility of a few dedicated people. Environmental stewardship must become part of Carbon County's everyday culture. Residents, planners, nonprofits, land trusts, businesses, and policy makers require strong alignment to succeed.

RECOMMENDED STRATEGIC ACTIONS

- Incorporate Return on Environment at the beginning of decision making.
- Prioritize areas to protect and restore.
- Develop an online tool to assess the financial pros and cons of all new development.
- Connect and expand open spaces by teaching the principles of good stewardship to landowners and provide a clear idea of how protecting nature has financial value for them and the community.
- Create incentives for resource protection.
- Assist sustainable businesses.
- Involve schools and learning centers.

PLEASE HELP US PROTECT CARBON COUNTY'S FUTURE

VISIT KITTATINNYRIDGE.ORG

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