

In response to regional threats....

Allegheny Land Trust developed this Regional Conservation Agenda to identify, prioritize and conserve lands that harbor biodiversity, manage water resources, and define our region's scenic character.



biodiversity



water



landscape character



THE ALLEGHENY LAND TRUST
GREENOPRINT
June 2008. Reprinted October 2014.

EXECUTIVE SUMMARY

Implementation Matrix

	Scale	Benefits	Protection Strategy	Implementation Partners	Funding Sources
BIOLOGICAL DIVERSITY	Parcel	•Protection of the region's unique biodiversity	•Direct conservation of land & easements •PA Natural Diversity Inventory	•Land trusts •DCNR •PADEP	•DCNR •Private foundation, •Corporate •Individual
WATER MANAGEMENT	Watershed	•Stormwater & Flood controls •Water quality improvements •Property value enhancement •Managed growth	•County Comprehensive Plan •Municipal land planning, ordinances, and code enforcement •Landbanking	•Municipalities •Municipal authorities •Watershed organizations •Land trusts •3 Rivers Wet Weather •County...and... •DCED •PADEP •USACOE •EPA •FEMA	•Municipalities •County •State agencies •Federal agencies •Bonds •Private Sources
LANDSCAPE CHARACTER	Landscape	•Protection of region's scenic character and air quality	•County Comprehensive Plan •Municipal planning, ordinances, code enforcement	•Municipalities •County •Land trusts	•DCNR •PennDOT via (Enhancement Funding) •Private Sources

KEY
ROLES

DCED=PA Dept. of Community and Economic Development; PADEP=Pa.Dept. of Environmental Protection; USACOE=U.S. Army Corps of Engineers; EPA=US Environmental Protection Agency; FEMA=Federal Emergency Management Agency; PennDOT=PA Dept. of Transportation; Management Agency

LAND TRUSTS	Direct conservation of land; planning assistance; site assessment; policy development and advocacy; education; research; land banking; and ongoing land stewardship
MUNICIPALITIES	Planning and land use management; integrate Greenprint into Comprehensive Plans; adopt and enforce conservation-oriented zoning and land development codes; create Transfer Development Rights programs
COUNTY GOVERNMENT	Integrate Greenprint into Comprehensive Plan to advocate conservation of highly functional green infrastructure; create incentives for conserving Greenprint areas; promote awareness and share Greenprint mapping; funding
STATE AGENCIES	Restrict new sources of stormwater and sewage inputs into failing systems; regulate geologically hazardous areas; funding
FEDERAL AGENCIES	Promote and fund flood prevention strategies; evaluate performance of outdated flood control facilities

Advisory Committee

We Thank our Advisors for their Input, Suggestions, and Time: (alphabetically by organization)

Sue Thompson, 3 Rivers Ecological Research Center John Schombert, 3 Rivers Wet Weather Project Bob Hurley, Allegheny County Economic Development Curt Meeder & Rose Reilly, Army Corps of Engineers Noor Ismail, City of Pittsburgh Planning Director Eric Carlson, EPA Region 3 Dave French, Kimball Engineers William Kirk, McCandless Municipal Water and Sewer Authority Marijke Hecht, formerly of Nine Mile Run Watershed Association Jay Lucas, PA American Water Rick Lorson, PA Fish and Boat Commission Dennis Puko, PA Department of Community & Economic Development Steve Quick, Perkins Eastman Urban Planners Rita Coleman, Stuart Demanski PA Department of Environmental Protection Kathy Frankel, PA Department of Conservation and Natural Resources Davitt Woodwell, Pennsylvania Environmental Council Ray Reaves, Planning Consultant Art Gazdik, Ross Township Municipal Engineer Court Gould, Sustainable Pittsburgh Tyler Gourley, University of Pittsburgh Institute of Politics Charles Bier, Western Pennsylvania Conservancy

Acknowledgments: Image Earth, planning, graphic production; Landbase Systems, planning, data organization and advanced spatial analysis. Roy Kraynyk, photography unless otherwise noted. *We thank The Heinz Endowments for underwriting this project.*

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A Case for Conservation

Land provides natural system functions, also known as ecosystem services. These services vary based on the type of land and its placement in the landscape. Ecosystem services range from cleaning water and releasing oxygen to providing shelter and food for wildlife. Because of this, all lands have intrinsic value, some more than others. ALT developed the ALT GREENPRINT to identify lands with the highest capacity to perform three overlapping functions: harbor biologic diversity, manage water resources, and provide scenic character.

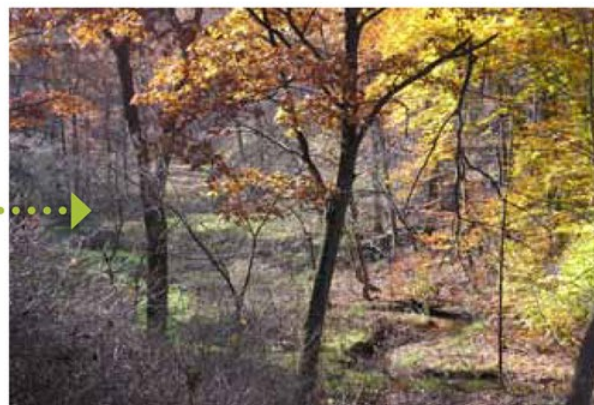
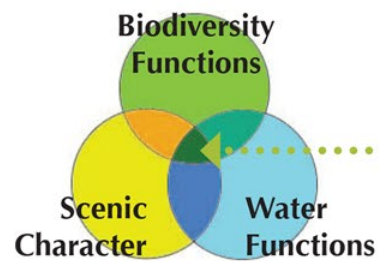
ALT's GREENPRINT methodology involved collecting, compiling, and analyzing a vast set of available data and reports on the region's land and water resources. GIS technology was applied to processing and integrating information in order to identify lands in Allegheny County with the greatest capacity to perform certain ecosystem services.

Conserving land that harbors diverse or unique plant and animal species; manages rainwater before it becomes stormwater; has highly visible features that shape the region's scenic character—are the lands that provide the greatest public benefit. Lands that do all three are prioritized and recommended for conservation in this Regional Conservation Agenda.

ALT GREENPRINT was completed for Allegheny County but can be applied to different spatial scales from a single watershed to a greater multi-county area.

Intent

Allegheny Land Trust intends to use the ALT GREENPRINT to promote strategic land conservation and to directly conserve highly functional landscapes that harbor biological diversity, manage water resources, and maintain the region's scenic landscape character.



WOODLANDS KEEP RAINWATER FROM BECOMING STORMWATER
Rainfall interception of a lone oak tree can be up to 27% of total precipitation, that's 27% of a typical rain event that does not reach the ground. It is caught and held by leaves, branches, trunk and bark, then evaporates from these surfaces.

In hardwood stands, annual precipitation interception by a forest canopy ranges from 6-48%.

Tree canopy, understory and ground litter, (fallen leaves and branches intercept 13-76% of annual precipitation.

Stormwater, Mar-Apr, 2007. "Not All Green Space is Created Equal"

Conclusions

Wooded slopes and ridgelines need greater protection from over-development, as they are the region's most visually prominent natural features and the most vulnerable to development. Wooded slopes frame our river corridors, define our communities, and complement the built environment. This has created a distinct and globally unique development pattern for the region.

[*"Physical and Ecological Investigation of Pittsburgh's Hillsides"*, 2004]

Watersheds with comparatively less development have correspondingly higher water quality, fewer floods, better hydrologic cycling, and potential for greater biological diversity.

For every 10% of a watershed that is left covered with trees, the cost of municipal water treatment decreases by approximately 20%. [from *The Economic Benefits of Land Conservation* by the the Trust for Public Land]

In Allegheny County, large woodland masses and north-facing wooded riverfront slopes harbor many of the county's biologically significant lands.

When woodlands are replaced by an equal amount of asphalt, the amount of runoff can be up to 50 times greater. [“Selection of Rational Coefficients per Land Use” (taken from Malcom, 1997, and Lindeburg, 1999)]

Recommendations

Conserve large tracts of woodlands in the upper reaches of watersheds to intercept rain water before it becomes stormwater.

Conserve large tracts of woodlands on steep slopes along the rivers to maintain their ecological services and maintain county's unique visual appeal.

Landbank developable lands in watersheds that suffer from frequent flooding and sewer overflows until degraded infrastructure is repaired or upgraded to prevent sewage overflow problems from worsening.

Dedicate more public resources to flood prevention.

Measure and document the economic benefits of ecological services to supplement the science behind ALT GREENPRINT. Durable economic metrics will help to enlist local government cooperation and support.

Q: What are Ecosystem Services?
A: "...the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life."

from, *Ecosystem Services: Benefits Supplied to Human Societies by Natural Ecosystems*.
Gretchen C. Daily, Editor

ALT GREENPRINT Process

Step 1. Collect Information

The team located, collected, and reviewed information from 13 entities that provided 170 datasets, two reports and one survey.

Step 2. Filter and Compile

Data was filtered for relevance, consistency and reliability. Useable data was compiled into twenty-one GIS data sets representing Physical Features and interpretative studies that we refer to as Modifiers.

The plotting of natural physical features such as streams and woodlands revealed a pattern of remaining natural land across the county. Based on the team's professional experience and input from the Advisory Committee, Modifiers were interpreted and categorized into three categories: Biodiversity, Water Resources and Management, and Landscape Character.

Step 3. Analyze

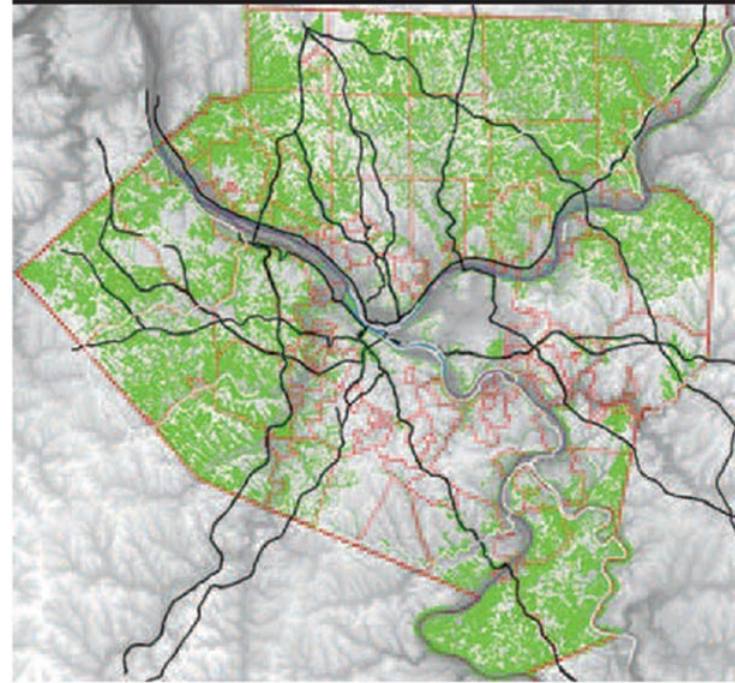
Physical Features were then overlaid with Modifiers to help rank or prioritize them. Where Physical Features and Modifiers overlap represents the highly functional lands. A composite representing Physical Features and Modifiers was created for each category: Biodiversity, Water Resources & Management, and Scenic Character.

Step 4. Synthesize

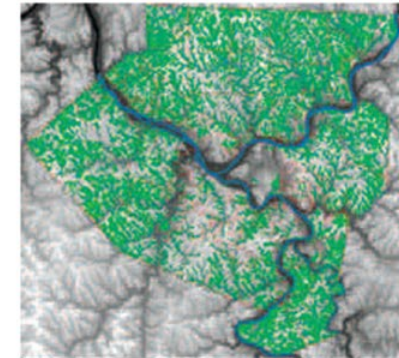
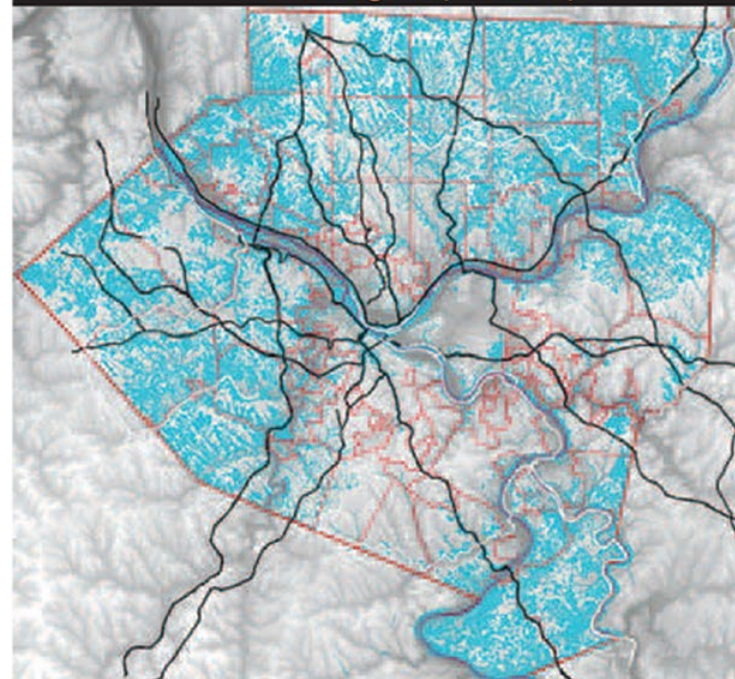
The final composite represents where all three categories overlap. These Greenprint Focus Areas are the highest functioning natural systems in the county. They are of primary importance to protect because they provide the greatest public benefits.



Land with the highest capacity for
BIOLOGICAL DIVERSITY
in Allegheny County

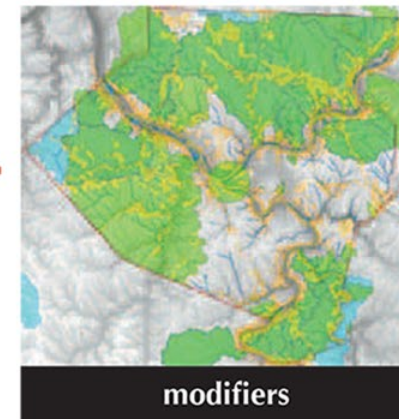


Land with the highest capacity for
WATER MANAGEMENT
in Allegheny County



physical features

combined with



modifiers

Data Layers Used:

Physical Features

- County Main Rivers, Streams, Wetlands
- County Biological Diverse Areas
- 3R-2N Woodlands Contiguous to Riparian Vegetation
- LBS Riparian Woodlands (within 75' of both streambanks)
- LBS Non-riparian Woodlands

Modifiers

- 3R-2N Watersheds Ranked on Biotic Integrity
- 3R-2N Watersheds Ranked on Eco Ratings
- WPC Natural Heritage Inventory Program

Existing datasets located and screened for ALT GREENPRINT (May 2007)

3 Rivers - 2nd Nature (3R-2N): Watersheds Ranked for Preservation and/or Restoration; Watersheds Ranked for Biotic Integrity; Watersheds Ranked for Eco-ratings; Forested Hillides Visible from Rivers; Woodlands Contiguous to Streams
3 Rivers Wet Weather (3RWW): Watersheds; Combined Sewage Overflows; Sanitary Sewer Overflows
Allegheny County: Base layers from Comprehensive Plan; Greenways; Wetlands; Agriculture Reserve Parcels Report
City of Pittsburgh: Physical and Ecological Investigation of Pittsburgh's Hillides, 2004 (aka The Hillside Report)
Federal Emergency Management Agency (FEMA): 100- and 500-year floodplains
Landbase Systems (LBS): Riparian Woodlands within 75' of Stream; Woodlands not touching streams; Woodlands Visible from Highways
Pennsylvania American Water: Drinking Water Intakes
PA Department of Environmental Protection (PADEP): Public Drinking Water Intakes; PA Integrated Water Quality Monitoring and Assessment Report (Streams Attaining Some Uses, Approved TMDLs); Act 167-Stormwater Management Plan for Pine Creek
PA Dept. of Transportation (PennDOT): Highway Traffic Counts
Southwest Planning Commission / Pennsylvania Environmental Council: Natural Infrastructure
U.S. Geologic Survey (USGS): Pomeroy & Davies Landslides
University of Pittsburgh: Public Opinion Poll on Water Treatment Facilities
Western Pennsylvania Conservancy (WPC): Natural Heritage Inventory; Aquatic Classification Project; Upper Ohio River Ecosystem Information System; Conservation Blueprint & Forest Block Analysis; Interior Forest Patches; Vernal Pools

DISCLAIMER: The best available data were collected. ALT did not verify the accuracy of the datasets used in the ALT GREENPRINT. There are areas of the county where no data were available.



ALT GREENPRINT A REGIONAL CONSERVATION AGENDA

Prioritizing Land Conservation for the Public Good

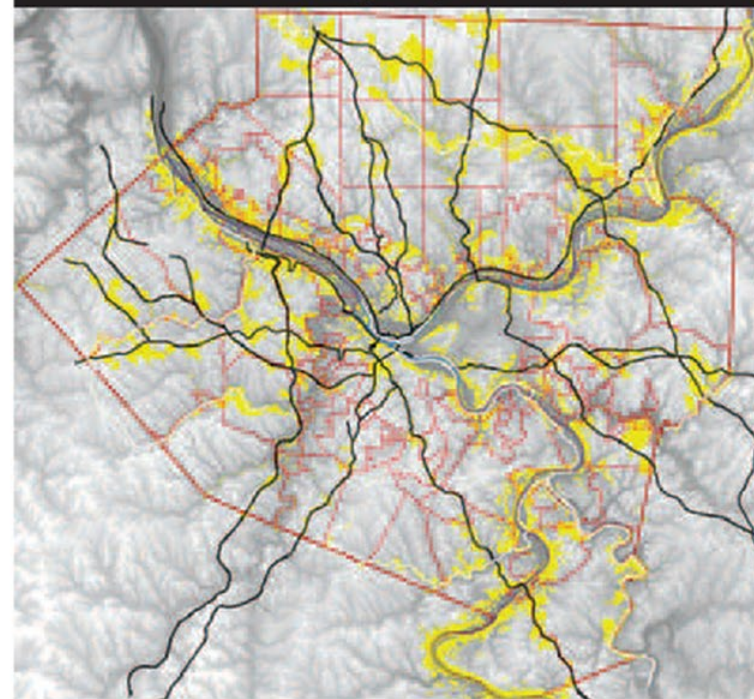




Dead Mans Hollow is a 434-acre parcel protected by ALT that exemplifies a Greenprint property with all three criteria: recorded biological diversity, water management capacity, and wooded riverfront slopes visible from the Youghiogheny River, Great Allegheny Passage Trail and highways.



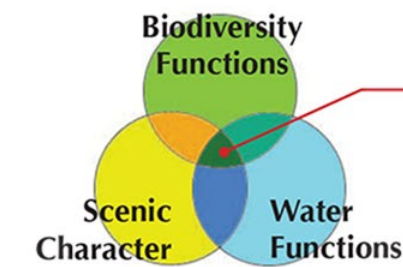
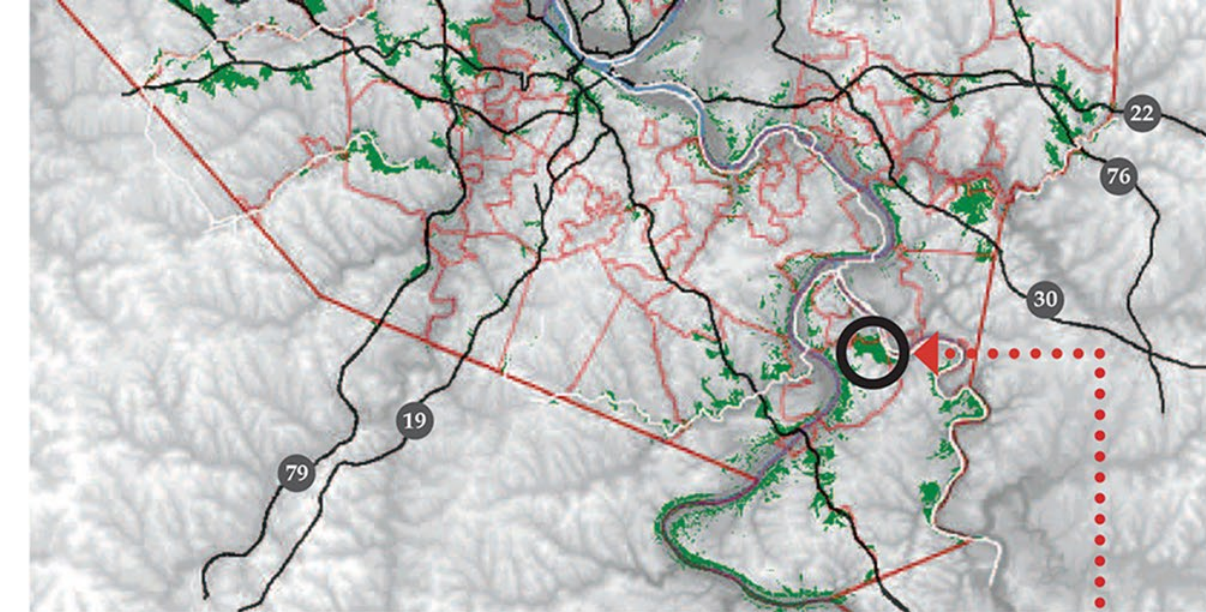
Highly visible lands that define SCENIC CHARACTER in Allegheny County



Data Layers Used: Physical Features

- County Main Rivers, Streams
- County Trails
- 3R-2N Forested Hillsides Visible from Rivers
- PennDOT Traffic Counts (>20,000/day)
- LBS Woodland Visible from Major Highways

This map shows wooded slopes adjacent to and visible from major highways, river corridors and trails (in white).

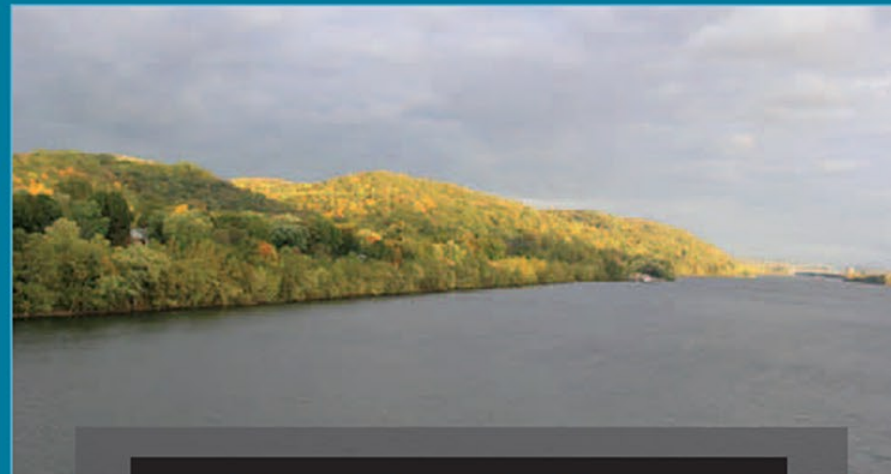


Greenprint Focus Areas
Biodiversity + Water + Scenic
(9.5% of county or 70.4 sq. miles)

forested hillsides—the landscape that defines our region's scenic character...

A survey by ALT revealed a strong demand for the preservation of scenic character afforded by wooded slopes next to rivers and along highways. What is unseen are all the other things wooded hillsides do, such as stabilize steep slopes, prevent landslides, intercept large quantities of rainwater, and provide wildlife habitat.

In defining Allegheny County's prototypical scenic landscape, we open a dialog toward protecting this vital natural system—we call it the Ridge to River Continuum.

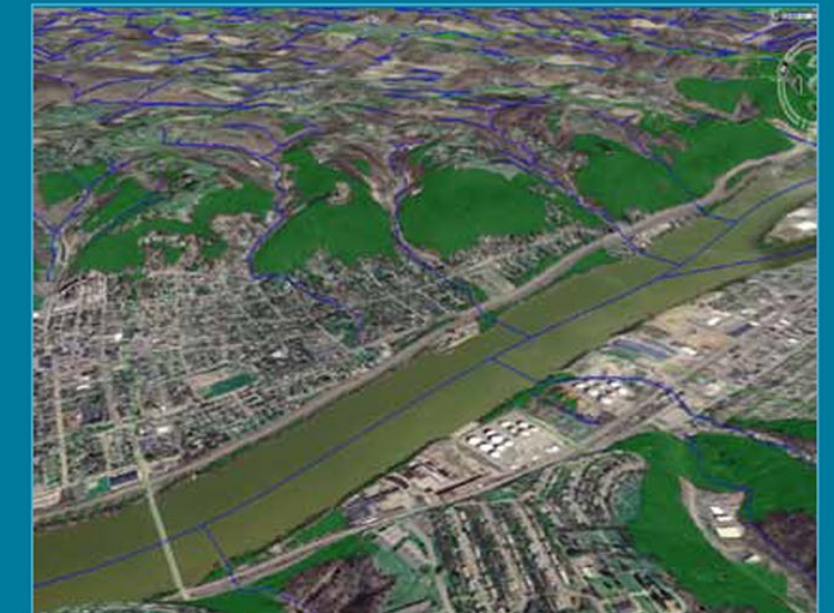


Ridge to River Continuum:
The visual continuity of uninterrupted forests from ridgeline to riverbank

Within the views one sees from major highways following rivers in Allegheny County are developed and natural lands—44% and 37% respectively. This tenuous balance is vulnerable to over-development.

Development of highly visible ridgelines and unstable wooded slopes permanently alters the region's visual character, Pittsburgh's green image, and can aggravate major landslides.

To the right in green is a sample of the remaining tracts of undeveloped natural lands that are visible from the Ohio River and highways adjacent to the Ohio River.



3R-2N's data layer, "Forested Hillsides Seen from Rivers" is overlaid onto a Google Earth perspective. Sewickley Bridge bottom left. Image credit: Landbase Systems.