



a r c e l l u s



D e s i g n

The Loyalsock Trail is a nearly 60 mile hiking trail in northern Pennsylvania that spans Lycoming and Sullivan Counties. Boy Scouts of America from Williamsport, PA, led by Howard Ulman, Jr., laid out the trail in 1951.





# m a r c e l l u s X D e s i g n

The Loyalsock Trail is well known for its exceptional scenic views of bucolic farmland, historical and cultural resources, pristine woodlands, majestic waterfalls, and the Loyalsock Creek.





# marcellus X Design

This is the section of the trail as it passes from Lycoming County into Sullivan County in September of 2010...



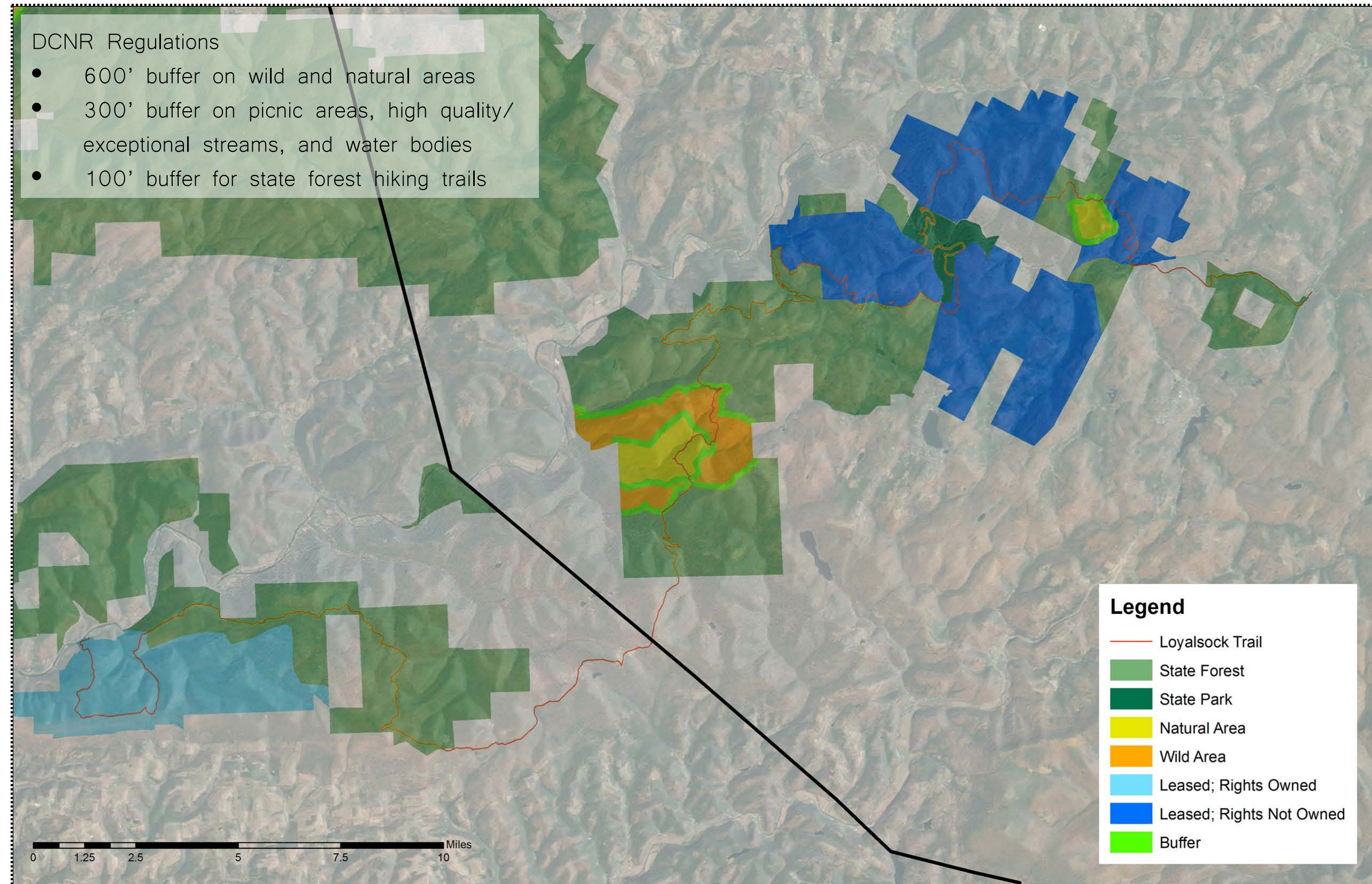


... and as a result of unchecked natural gas extraction, the same section of trail in May of 2013.





Little protection is provided for the Loyalsock Trail. The DCNR has minimal buffers in place on State Forest Land but portions of the trail on private land and those state-owned lands with severed mineral rights are at risk for impact.

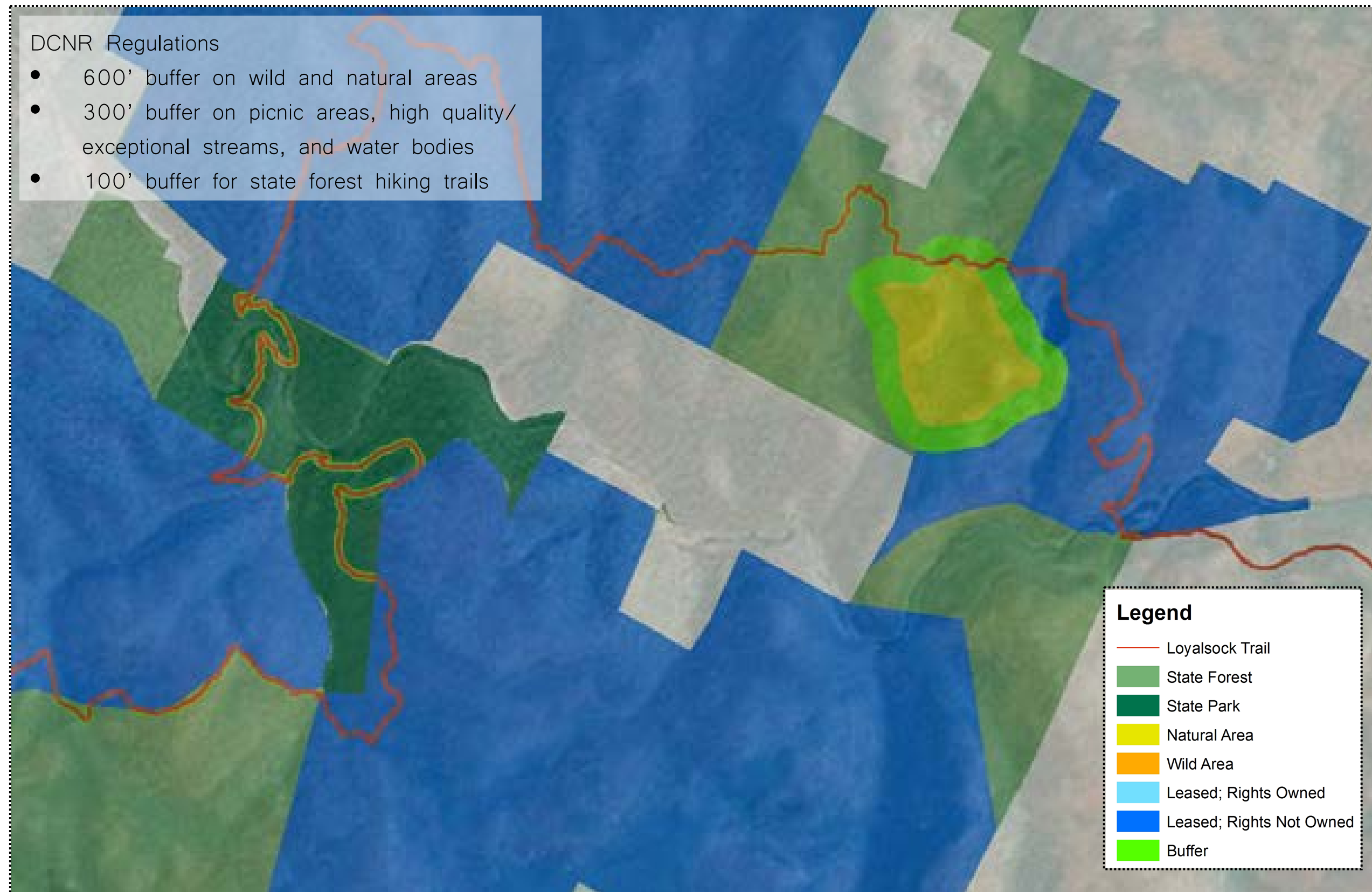




Closer scale to show the width of the buffers.

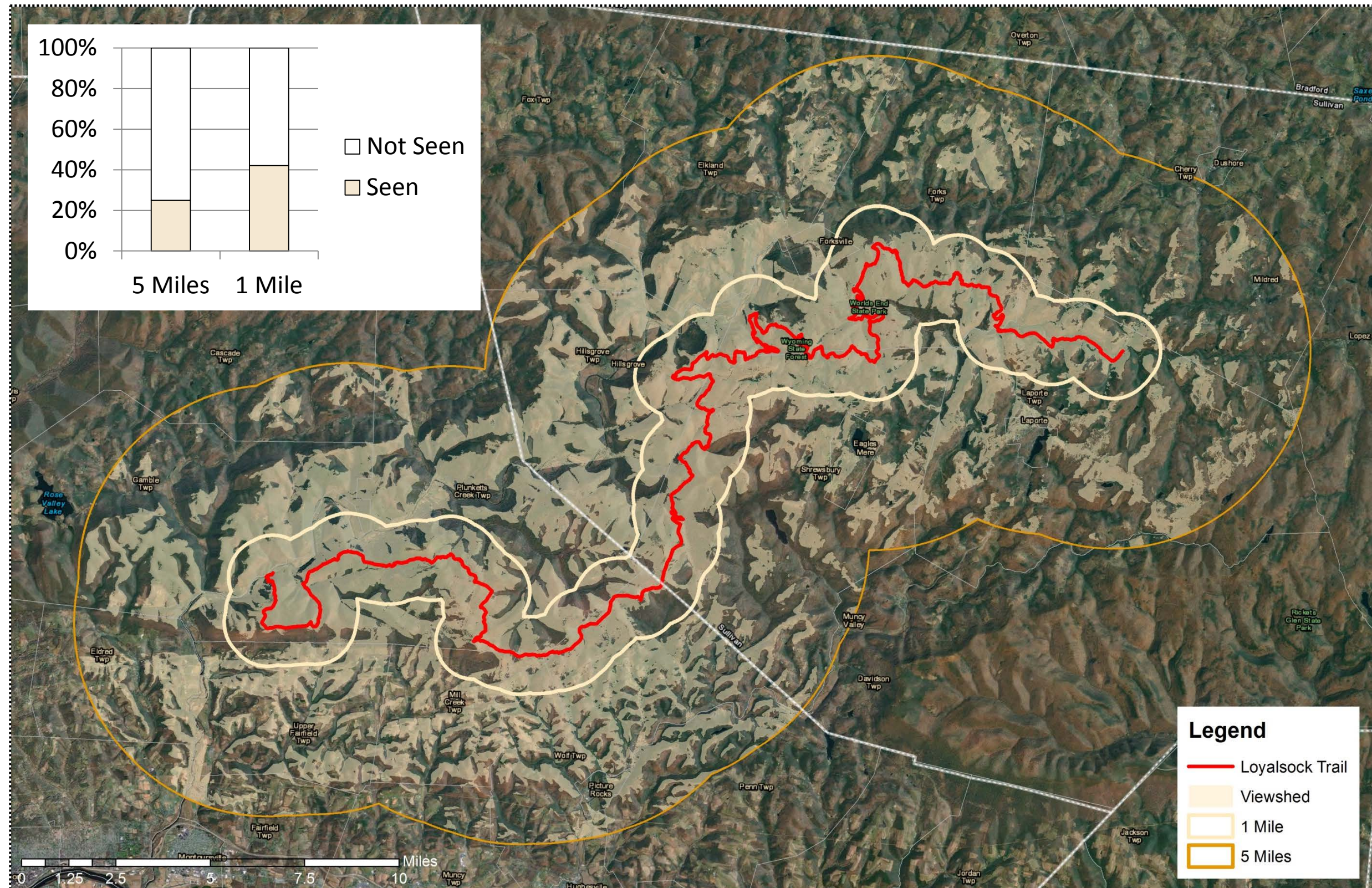
#### DCNR Regulations

- 600' buffer on wild and natural areas
- 300' buffer on picnic areas, high quality/exceptional streams, and water bodies
- 100' buffer for state forest hiking trails



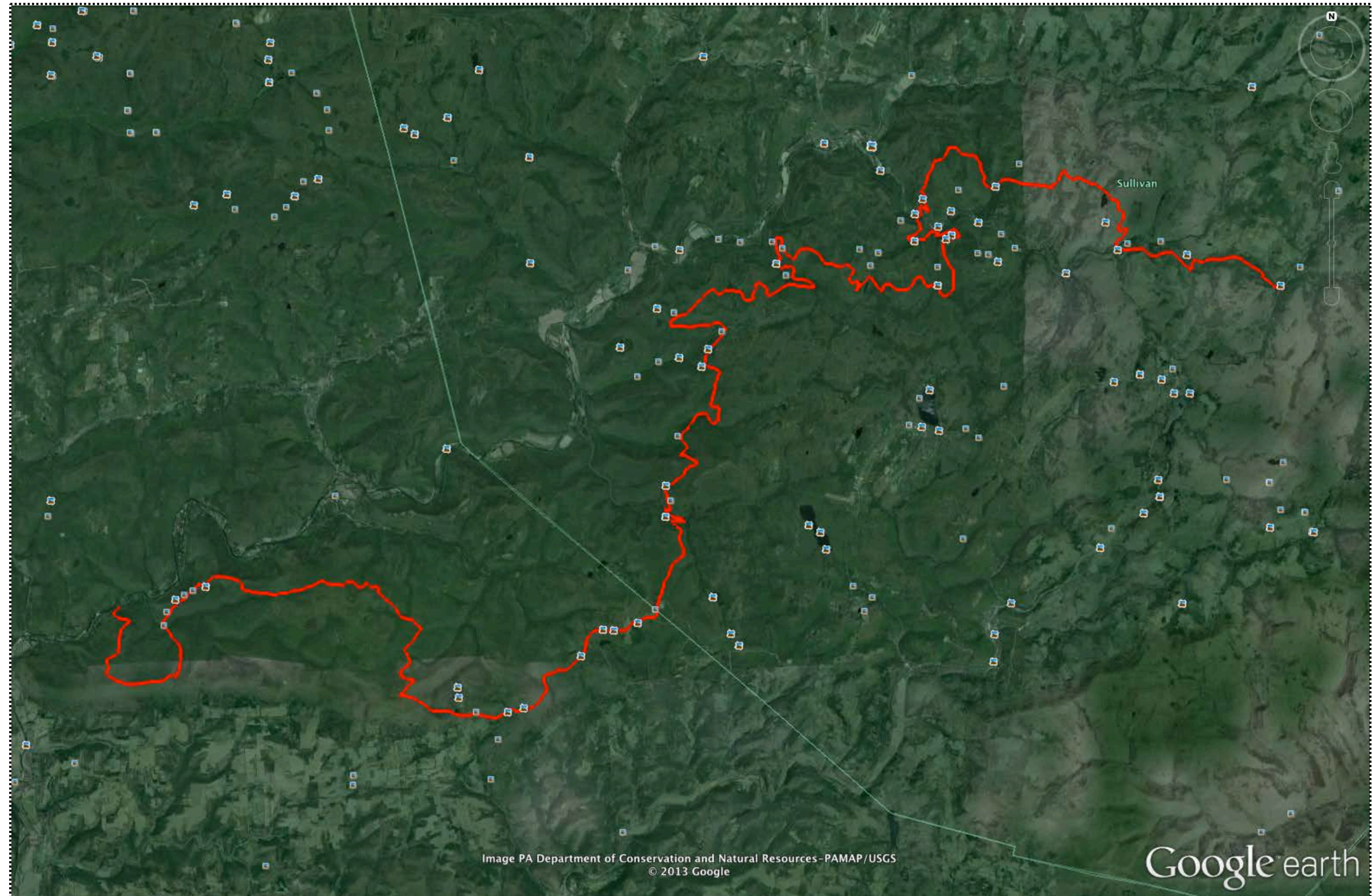


A substantial area can be seen from the Loyalsock Trail. 24.7% of all land within a 5 mile radius can be seen from the trail. This increases to 42.1% within a 1 mile radius. The Bureau of Land Management Visual Resource Management Classification Process identifies foreground and background as being up to 5 miles from the observer.<sup>1</sup>





With so much land, where does one begin? We need to identify the most important viewsheds and natural and cultural resources in close proximity to the Loyalsock Trail. For this we use crowd-sourced imagery.



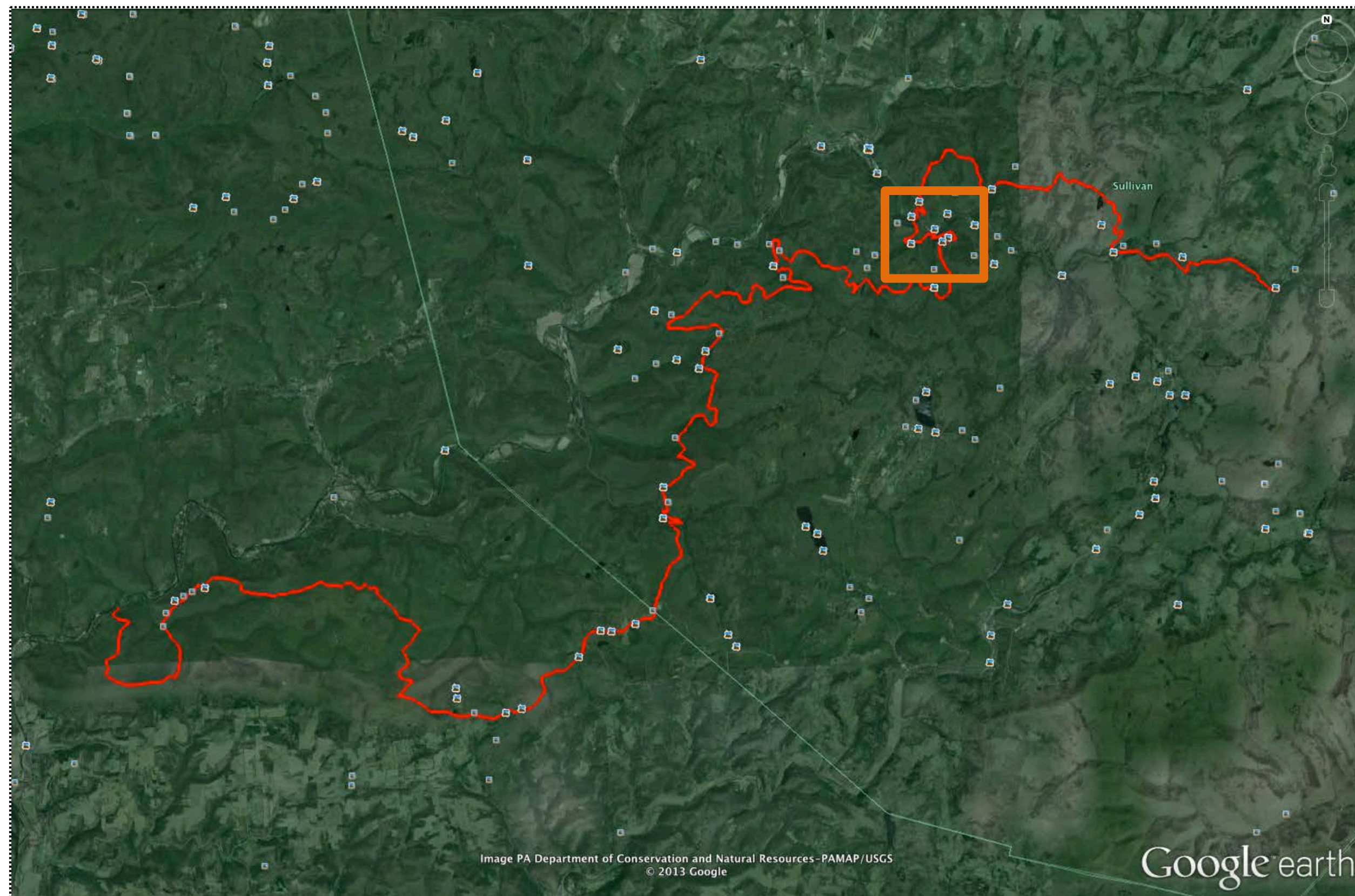


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Locals and tourists post images online to image hosting services like Panoramio whose images populate Google earth. Here we look for clusters of images to determine points of interest.





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This cluster of images identifies World's End State Park. Here the individual images are listed in order of popularity, indicating how many times the images has been viewed.

Panoramio | Google Maps

Explore ▾

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+

spaceangulz

⚙

Map | Satellite

Popular | Recent | Places | Indoor | Your photos

☒ Also show photos not selected for Google Earth

41°27'52"N 76°34'36"W

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The most popular photo is of the Canyon Vista. It has had over **13,500** views since it was posted in 2007.

Panoramio | Google Maps Explore - Search for a place

Return to classic Panoramio. Send feedback.



Loyalsock Creek Vista

13562 views 1 favorite

Selected for Google Maps and Google Earth

Comments (2)

Chris Sanfino

Add a comment (as spaceangulz)

Chris Sanfino 21569 photos

World • United States • Pennsylvania Forksville

Photo taken in Worlds End State Park, 82 Cabin Bridge Rd, Forksville, PA 18616, USA

41° 27' 45.61" N 76° 34' 22.15" W Misplaced? Suggest new location

Tags

• best • Western Pennsylvania

Photo details

Uploaded on July 17, 2007

© All Rights Reserved by Chris Sanfino

Camera: Hewlett-Packard HP PhotoSmart 318

Taken on 2003/06/21 18:24:25

Exposure: 0.011s

Focal Length: 6.79mm

F/Stop: f/80.000

ISO Speed: ISO100

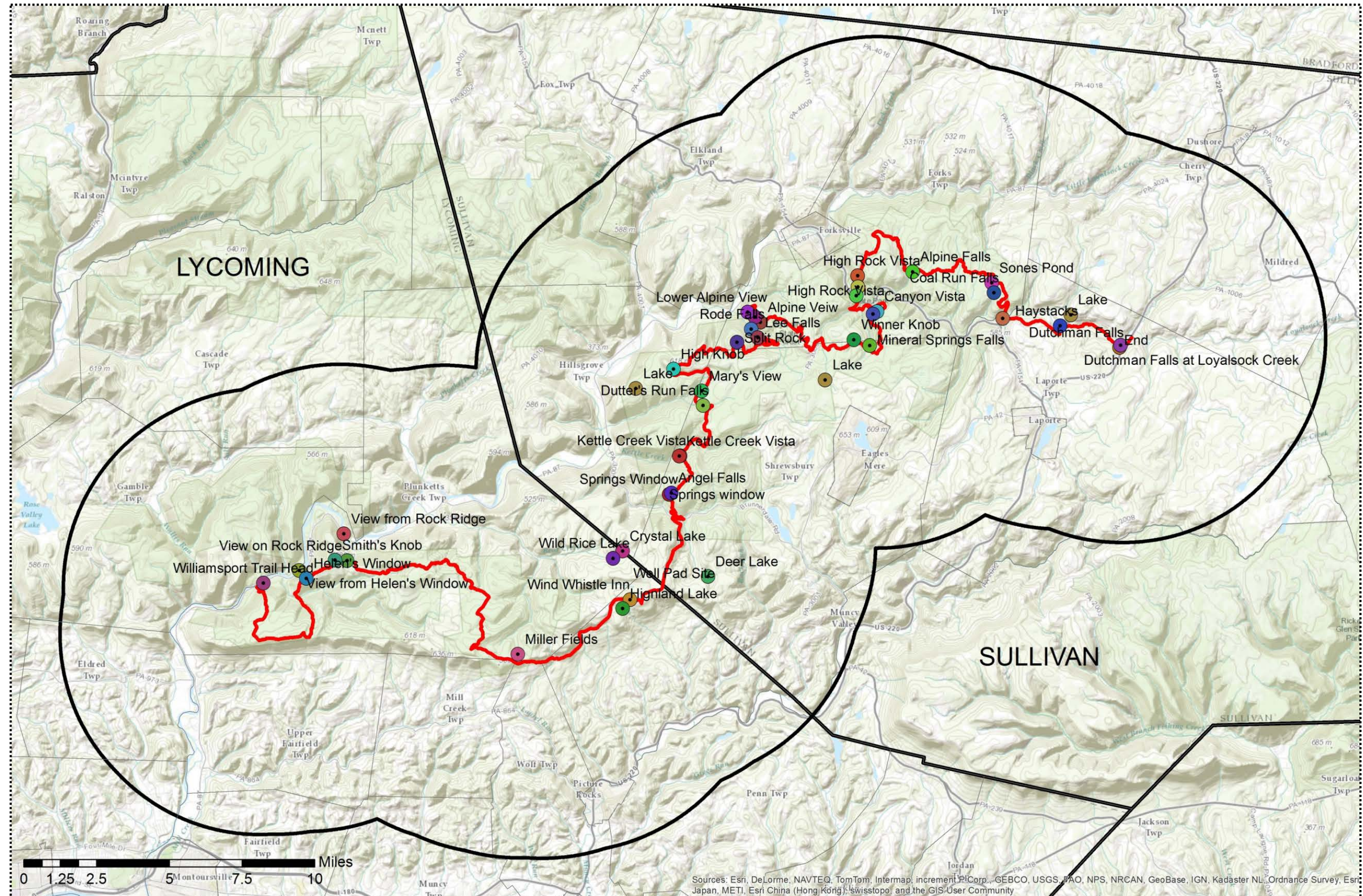
Exposure Bias: 0.00 EV

No flash

**13526 views**

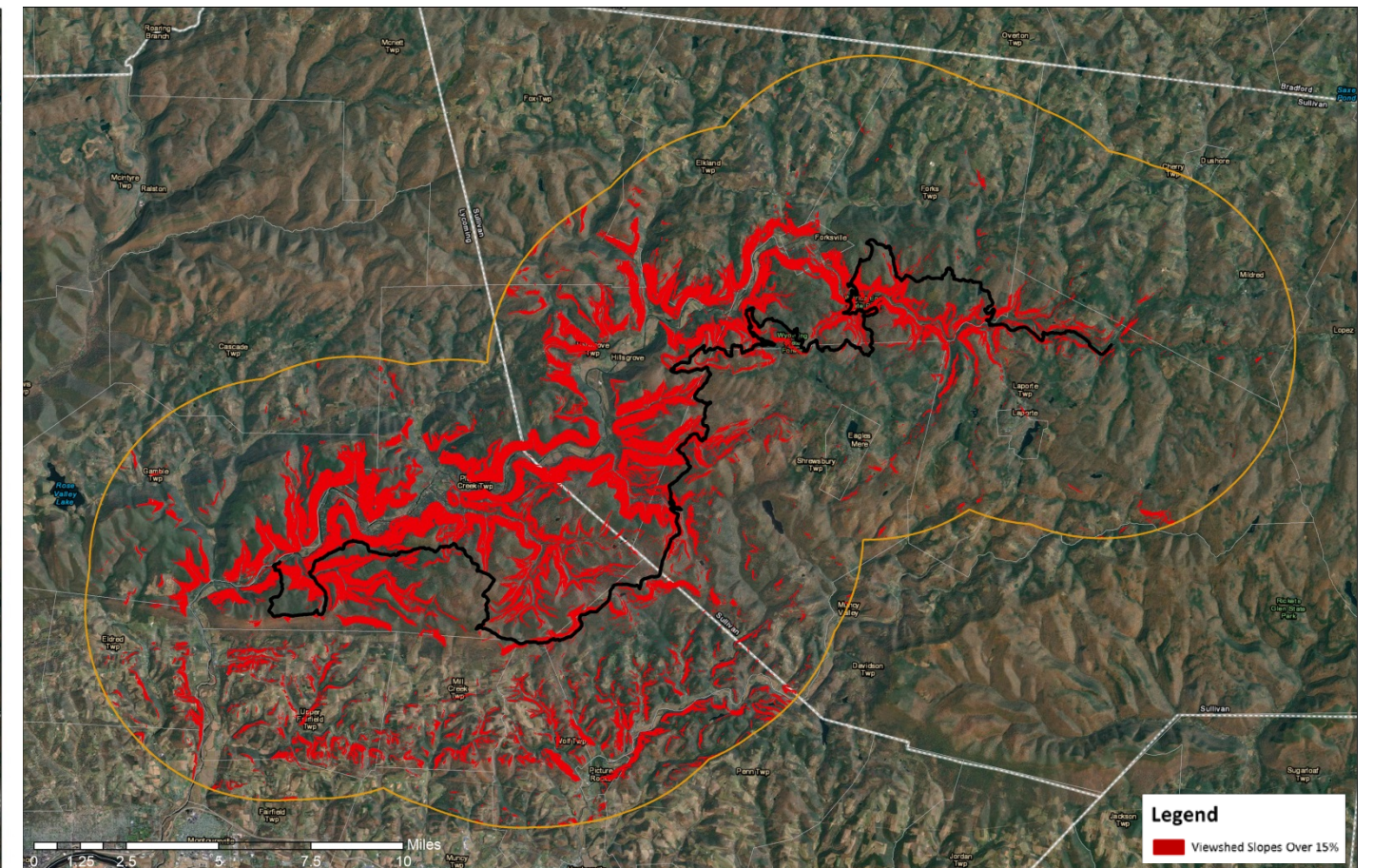
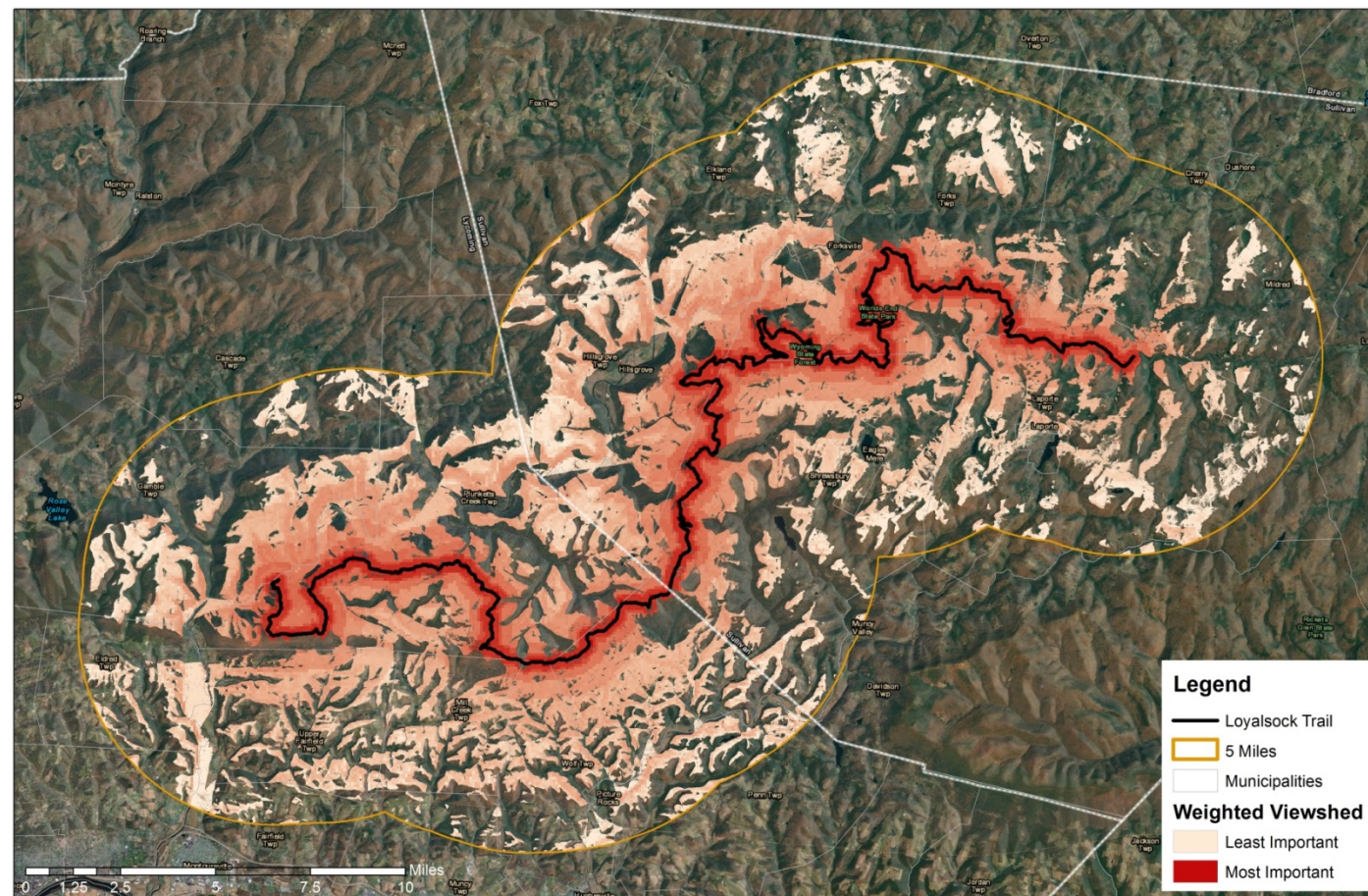


Using this technique of analyzing crowd-sourced geo-referenced photos, we can identify the places and views that are most important for conservation.





In addition to identifying these points, areas closest to the trail should be provided the most protection as well as those with more direct views. The map below weights importance of trail views according to distance and angle of view. Steeper slopes have more direct views while shallow slopes obscure views. No development should occur on slopes above 15%.



### Suggested Ordinance Stipulations

- Designation as National Recreation Trail
- Viewshed Protection
  - Preservation of individual viewsheds
  - No development of slopes greater than 15%
- Reduction in Noise Pollution
  - Maximum 60 dB noise pollution tolerance with goal of 30 dB or less
- Policy and permitting changes
  - Recognition in permitting
  - Identification of statewide importance



Expansion upon suggested scenic viewshed preservation ordinance:

## Preservation of Scenic Viewsheds

"If you foolishly ignore beauty, you'll soon find yourself without it...but if you wisely invest in beauty, it will remain with you all the days of your life..." ~Frank Lloyd Wright

The closer and more severe the angle of the area being observed, the more visual impact it has.

### Distance Zones

The distance zones are outlined on topographic maps in three areas: (1) foreground/middleground, (2) background, and (3) seldom seen. The foreground/middleground zone is a distance of from 0 to 5 miles away. The background is the remaining area up to 15 miles distant, and seldom seen is the area beyond 15 miles.

All distances are taken from any substantial travel corridor.<sup>1</sup> For this project, we will be concerning ourselves with a 5-mile radius surrounding the Loyalsock Trail.

### Distance

The contrast created by a project usually is less as viewing distance increases.<sup>2</sup>

### Angle of Observation

The apparent size of a project is directly related to the angle between the viewer's line-of-sight and the slope upon which the project is to take place. As this angle nears 90 degrees (vertical and horizontal), the maximum area is viewable.<sup>3</sup>

Within the 5 mile radius viewshed of the entire Loyalsock Trail:

- No development on slopes greater than 15%

- Preservation of the individual viewsheds of the identified cultural and natural resources to include but not limited to: Allegheny Ridge, Helen's Window, Smith's Knob, Angel Falls, Kettle Creek Vista, Dutter Run Falls, Mary's View, High Knob, Lee's and Rode Falls in Ketchum Run Gorge, Alpine Views, Mineral Spring, Loyalsock Canyon Vista, Worlds End State Park, High Rock Vista, Alpine Falls, Sones Pond, The Haystacks, and Dutchman Falls.

1. Bureau of Land Management. Visual Resource Management Classification Process. PDF. 1992.

2. Bureau of Land Management. Manual 8431 - Visual Resource Contrast Rating. 1986.  
[http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.79462.File.dat/8431.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.79462.File.dat/8431.pdf)

3. Bureau of Land Management. Manual 8431 - Visual Resource Contrast Rating. 1986.  
[http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information\\_Resources\\_Management/policy/blm\\_handbook.Par.79462.File.dat/8431.pdf](http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.79462.File.dat/8431.pdf)



Expansion upon suggested noise pollution ordinance:

## Noise Pollution

Drilling rigs are audible up to 700' away with occasional spikes of sound heard up to 1000' away. Average noise production is 71-79 decibels at 200'.<sup>4</sup> A quiet library is 30 decibels. An average neighborhood or normal conversation at 3' is 60 decibels. A telephone dial tone is 80 decibels and city traffic is 85 decibels. A 10 decibel increase is perceived as being twice as loud.<sup>5</sup>

Buffers can reduce noise from roads and other sources to levels that allow normal outdoor activities to occur. A 100-foot wide planted buffer will reduce noise by 5 to 8 decibels (dBA). Using a barrier in the buffer such as a landform can significantly increase buffer effectiveness (10 to 15 dBA reduction per 100-foot wide buffer with 12-foot high landform.) If 100-ft wide tree/shrub buffer is used, the [recreation area] needs to be 100 to 200 feet behind the buffer. <sup>6</sup>

The [recreation area] can be located immediately behind the buffer if a 12-ft high landform or constructed berm is incorporated into the buffer.

Regardless of view:

- To maintain the wilderness characteristic of the Loyalsock Trail, the ambient sound level should be a maximum of 60 decibels, with levels closer to 30 decibels being more desirable.
- In farm fields or other open areas, drilling rigs must be placed a minimum of 700' away from the trail.
- In partial- or fully- vegetated areas, drilling rigs must be placed on the far side of a 300' vegetated buffer with an additional 200' between the trail and the buffer, for a total of 500', OR the drilling rig may be placed on the far side of a 200' vegetated

buffer if a 12' high landform or berm is incorporated into the buffer.

- The buffers, including any landforms or constructed berms, should run parallel to the trail for the length of the drilling site.
- Constructed berms to be removed after risk of decibel violations ends (i.e. when drilling and hydraulic fracturing are complete.)

4. Behrens and Associates, Inc. Gas Well Drilling Noise Impact and Mitigation Study. April, 2006.

<http://pstrust.org/docs/GasWellDrillingNoiseImpactandMitigationStudy.pdf>

5. Galen Carol Audio. Decibel (Loudness) Comparison Chart. 2007.

<http://www.gcaudio.com/resources/howtos/loudness.html>

6. Bentrup, G. Conservation buffers: design guidelines for buffers, corridors, and greenways. Gen. Tech. Rep. SRS-109. Asheville, NC: USDA, Forest Service, Southern Research Station. 2008. [http://nac.unl.edu/buffers/guidelines/6\\_aesthetics/4.html](http://nac.unl.edu/buffers/guidelines/6_aesthetics/4.html)



Expansion upon suggested policy change ordinance:

## Change in Policy

Any policy and regulations must<sup>7</sup>:

- Specifically identify the LT – Mention the Loyalsock Trail specifically and prominently, so that there is no misunderstanding on the part of developers about the importance and fragile nature of the trail. This is required because of the unique, valuable, and fragile nature of the trail and its involvement with the Marcellus shale formation in Pennsylvania.
- Recognize “statewide significance” – Specifically recognize the Loyalsock Trail as a “resource of statewide significance.”
- Include the trail in the permit process – Require permit applications to indicate if a proposed drilling site or supporting infrastructure is within one mile of any portion of the Loyalsock
- Trail and its branches and to indicate if vehicle traffic associated with the permit application will cross the trail. – Require permit applications to indicate specific measures to be taken to protect the trail. – Require permit applicant to describe specific measures that will be taken to prevent unauthorized vehicular access to remote areas over the long term.
- Require assistance with landowner relations – Require, in situations where the developer has agreements with a private landowner, and the relationship between the LT and the private landowner may change due to development, that the developer will assist in reaching an arrangement whereby both the trail and the landowner may benefit.
- Require assistance with trail repair and reroutes – Require, in situations where damage to and/or closure of the trail cannot be avoided, that the developer must assist in repairing and/or relocating the trail, recognizing that trail quality and continuity are of utmost importance. Such assistance must include, but not be limited to, reimbursement for tools and materials, contractor costs, purchase of trail easements from willing landowners, legal costs, and the costs of updating trail signage, guidebooks, and maps.

7. Borrowed from the Finger Lakes Trail Conference, Inc. Comment on the [Draft] Supplemental Generic Environmental Impact Statement. 17 December 2009.



Another level of protecting the Loyalsock Trail would be establishing it as a National Recreation trail.





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This would give the trail more clout for designating protective measures by giving it national publicity, and increased prestige and visibility. These would, in turn, have the benefit of increasing tourism to the region.





Increased tourism would include economic benefits such as:

- Direct spending by visitors
  - Restaurants
  - Hospitality services
  - Campgrounds
  - Hotel, motel, etc.
  - Gear and supplies
- Indirect spending
  - Money circulated and re-spend in local economy
- Redistributes wealth from urban to rural areas
- New business and commercial opportunities
  - Meet expectations and needs of visitors
  - Builds a more diverse economic base
  - Reduces reliance on traditional industries
- Employment opportunities
- Increased commercial and residential development
  - Many visitors return as residents expanding demand for housing and other services



And social benefits such as:

- Increasing community facilities
  - New and expanded infrastructure, retail, restaurants and entertainment, transport services, education and sporting facilities
  - Improves quality of life for community which may not otherwise make improvements based on residential population alone
- Preservation of cultural heritage
  - Increased awareness and pride in cultural resources and further possible tourism opportunities
- Broadened community outlook
  - Encourages communities to widen their outlook and embrace new ideas
- Increased awareness and pride
  - Attracting visitors can heighten local awareness resulting in a greater sense of pride and ownership
  - Community takes stock in its assets and distinctive characteristics
  - Boosted collective ego knowing people travelled from across the state or country to visit
- Re-population
  - Tourism can slow, halt, and sometimes even reverse the population emigration to urban centers
  - Makes local areas and employment opportunities more attractive to young people
  - Attracts new residents from urban centers



Benefits directly related to the National Recreation Trails program include:

- Access to technical assistance from NRT Program partners
- Periodic electronic newsletters with program updates, newsworthy activities, technical information, and innovative solutions to trail issues from around the country
- Access to networking and training opportunities.
- Access to an e-mail news group for NRT managers only to receive updates on funding, resources, and technical assistance opportunities
- Assistance with recognition and special events highlighting the trail
- Trail markers with the NRT logo for your trail
- Letters of support for fundraising and trail protection efforts.



Benefits directly related to the National Recreation Trails program include:

- Access to funding opportunities available from the NRT Program partners; trails with NRT designation are eligible to be considered for support from the National Park Service Challenge Cost Share Program, Bureau of Land Management, and USDA Forest Service Challenge Cost Share Programs.
- Some state funding programs also consider NRT designation in allocating Recreational Trails Program, Transportation Enhancements, and other funding administered through the U.S. Department of Transportation's Federal Highway Administration.
- Access to update online trail information in the online NRT database



The National Recreation Trails application is an online application process. The department of the Secretary of the Interior handles designation on an annual basis. Applications are due on November 1st, and announcements are made in June.

- Required Information:
  1. Trail Information
  2. Contact Information
  3. Owner Consent and State Support
  4. Primary Trail Photo and Primary Trail Map
  5. Supporting materials
  6. Signature page
- Full information and details can be found at <http://www.americantrails.org/nationalrecreationtrails/>