Access to Pennsylvania's Outdoor Recreation Areas

Methods and Key Findings by The Trust for Public Land

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Introduction

The Pennsylvania Department of Conservation and Natural Resources (DCNR) is in the process of creating its 2020-2024 Pennsylvania Outdoor Recreation Plan. Identifying areas with the greatest need and opportunity for outdoor recreation is integral to this effort. To support the plan, DCNR and Pennsylvania Land Trust Association have partnered with The Trust for Public Land. As part of The Trust for Public Land's mission to create parks and protect land for people, TPL seeks to create ready and equitable access to the great outdoors for everyone. Building on more than forty years of experience in strategically targeting park creation and land protection to access "gap areas," TPL is using the power of Geographic Information Systems (GIS) mapping to evaluate these needs more precisely. In Pennsylvania, TPL's Research and Innovation Team used the data analysis methods developed through the AIM, ParkServe, and ParkScore programs to assist DCNR in identifying areas with the greatest need and opportunity.

Methods and Results

Introduction

The analysis conducted by TPL's Research and Innovation Team utilized GIS to understand outdoor recreation in Pennsylvania. Many of these maps are focused on identifying *needs*. These maps utilize data providing the location of recreational sites (e.g. parks and open access lands, trails, and water access points) to locate areas lacking recreational access, and use demographic data to locate the populations with the greatest need within these areas. Other maps, such as the Recreation Opportunity Spectrum, and the two Appalachian Trails analyses, help stakeholders to understand their *opportunities*. For all of these analyses, in addition to the maps shown in this report, TPL has provided separate excel tables providing statistics related to population demographics and (in the case of the Recreation Opportunity Spectrum) land cover type, at the county or municipality level.

Measuring Need

Several of the GIS analyses described below are focused on identifying the areas with the greatest need for recreational access. Because these analyses utilized the same framework for ranking need, and to avoid repetition in this report, this framework is explained here.

This approach was developed as part of TPL's ParkServe program, which identifies the areas with the greatest park need in cities throughout the country. This method begins by identifying places that are outside of a 10-minute walk to the recreational access type being assessed (e.g. parks, trails, open access lands, or water access points). All populated areas in a county/municipality that fall outside of a 10-minute walk or drive (depending on the analysis being conducted) service area are assigned a level of park need (3 = moderate, 4 = high, 5 = very high), based on a weighted calculation of three demographic variables from the 2018 Forecast Census Block Groups demographic data provided by Esri.

- Population density - weighted at 50%
- Density of children age 19 and younger – weighted at 25%
- Density of households with income less than 75% of the county median household income – weighted at 25%

These weights are identical to the ParkServe protocol, and could be adjusted by DCNR in the future, for example, to identify priorities for aging in place. Weights for each category were dependent upon a populated area's density value relative to the rest of the county in which it was located. Since the analysis was carried out at a county level, they can be used to locate the highest need areas in each county.

Public Parks, Trailheads, & Open Access Recreation Areas *10-Minute Walk Analysis*

Introduction

This analysis helps to inform park planning efforts by identifying areas with the greatest need for accessible outdoor recreation opportunities. It begins by identifying the areas that are not within a 10-minute walk to a public park, trailhead, or other open access recreation area, and weights these areas based on demographic factors (see Measuring Need above).

Each county is analyzed separately, and so the resulting map (see Figure 1) should be used to identify the highest need areas within a county, rather than to draw comparisons between counties. For example, a "very high" level of need in Butler County is not necessarily equivalent to a "very high" need level in Allegheny County. Although both of these areas are outside of a 10-minute walk to recreational access, the ranking of "very high" (as opposed to "high" or "moderate") is based on how that area's demographics compare to other areas within its own county. However, as a part of The Trust for Public Land's work, excel spreadsheets with county-specific data have been delivered to DCNR. These can be used to rank counties based on need. The "Aligning Needs and Opportunities" section of this report provides some examples of how to use these spreadsheets. A more detailed description of the data and methods employed follows.

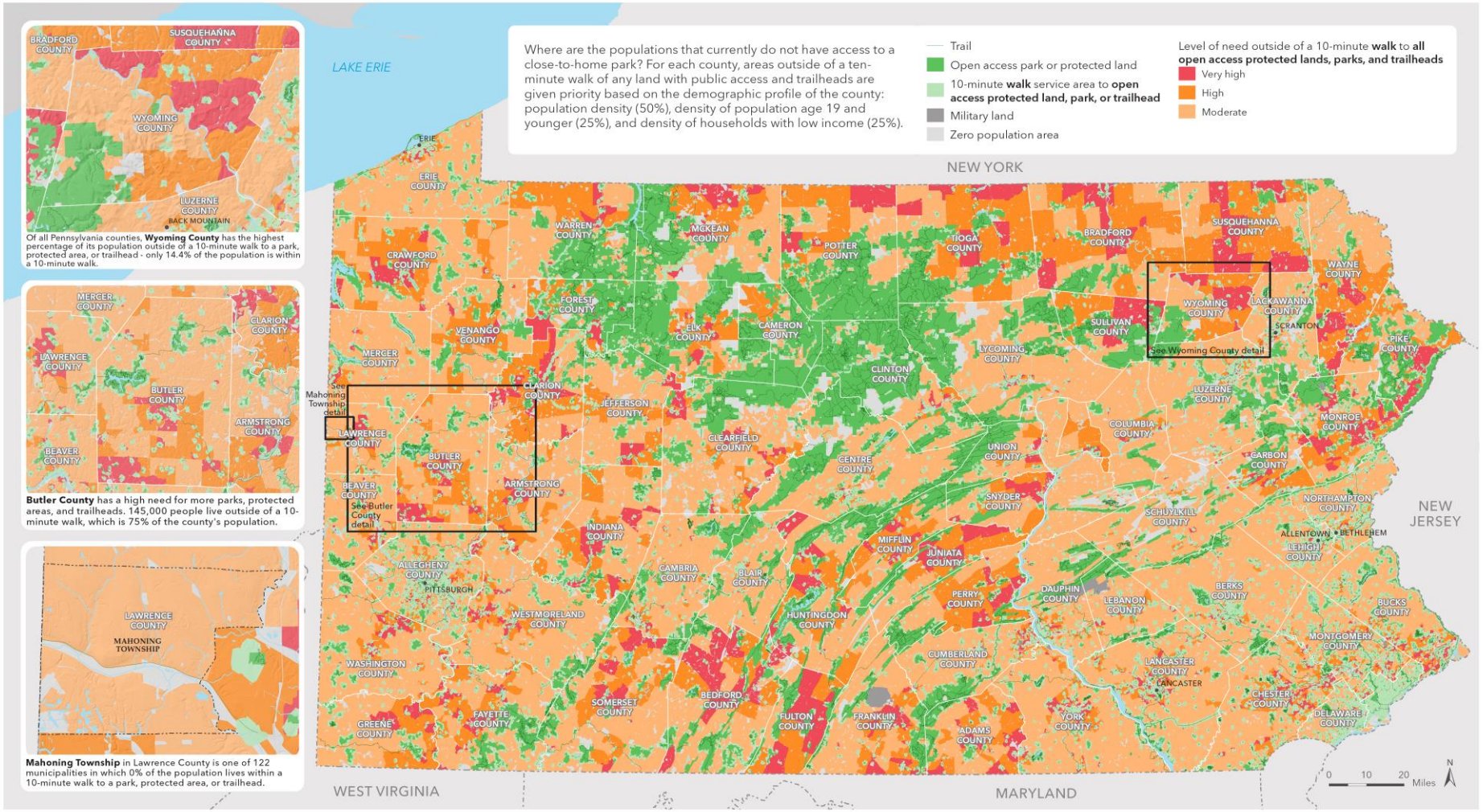
Data and Methods

Open access protected lands data processing: Open-access lands from PALTA's[1] statewide protected properties dataset, PA Conserved Land, was compared to the ParkServe dataset to identify missing open access protected lands polygons in either dataset. The ParkServe dataset was used as the base dataset. Any polygon that existed in any of the open access feature classes provided by PALTA, but missing from the ParkServe dataset, was appended to the final dataset. School parks were removed from the PALTA data due to the uncertainty of public accessibility.

[1] A full listing of the data provided by PALTA is available in Appendix 1: Summary of Pennsylvania Inputs Provided to the Trust for Public Land by the Pennsylvania Land Trust Association for the GIS Analysis of Park/Trail Access

10-minute walk service areas for open access polygons: Street Map Premium was used as the road network to build the 10-minute walk service areas. Each open access polygon was buffered by 100 feet, and an "access point" was placed wherever this buffer intersected the road network. These access points were then used as the starting points to build the 10-minute walk service areas. If an access point was placed on a road that did not allow pedestrians, the model then searched for a walkable street within 200 feet. Polygons that were further than 100 feet from any nearby road did not receive an access point. Access points that were more than 200 feet from any walkable road were not utilized when solving the network. "WalkTime" was used as the impedance attribute and no restrictions were used except "Walking."

10-minute walk service areas for trailheads: Street Map Premium was used as the road network to build the 10-minute walk service areas. Trailhead points were provided by PALTA using data from Explore PA Trails. Pennsylvania Game Commission trails were also included. Three trailheads were removed: "Rausch Creek Off Road Park Trails," "Rock Run ATV Trails," and "Anthracite Outdoor Adventure Area Trails." These trails were removed because they require an entrance fee, unlike the other open access parks, lands, and trails in the analysis. The resulting trailhead data points were used as input access points to build the 10-minute walk service areas. Similar to the methodology described above, the model searched for a walkable road within 200 feet of each access point. Trailheads that were more than 200 feet from any walkable road were not utilized when solving the network. "WalkTime" was used as the impedance attribute and no restrictions were used except for "Walking."



Level of need outside of a 10-minute **walk** to **all open access protected lands, parks, and trailheads**

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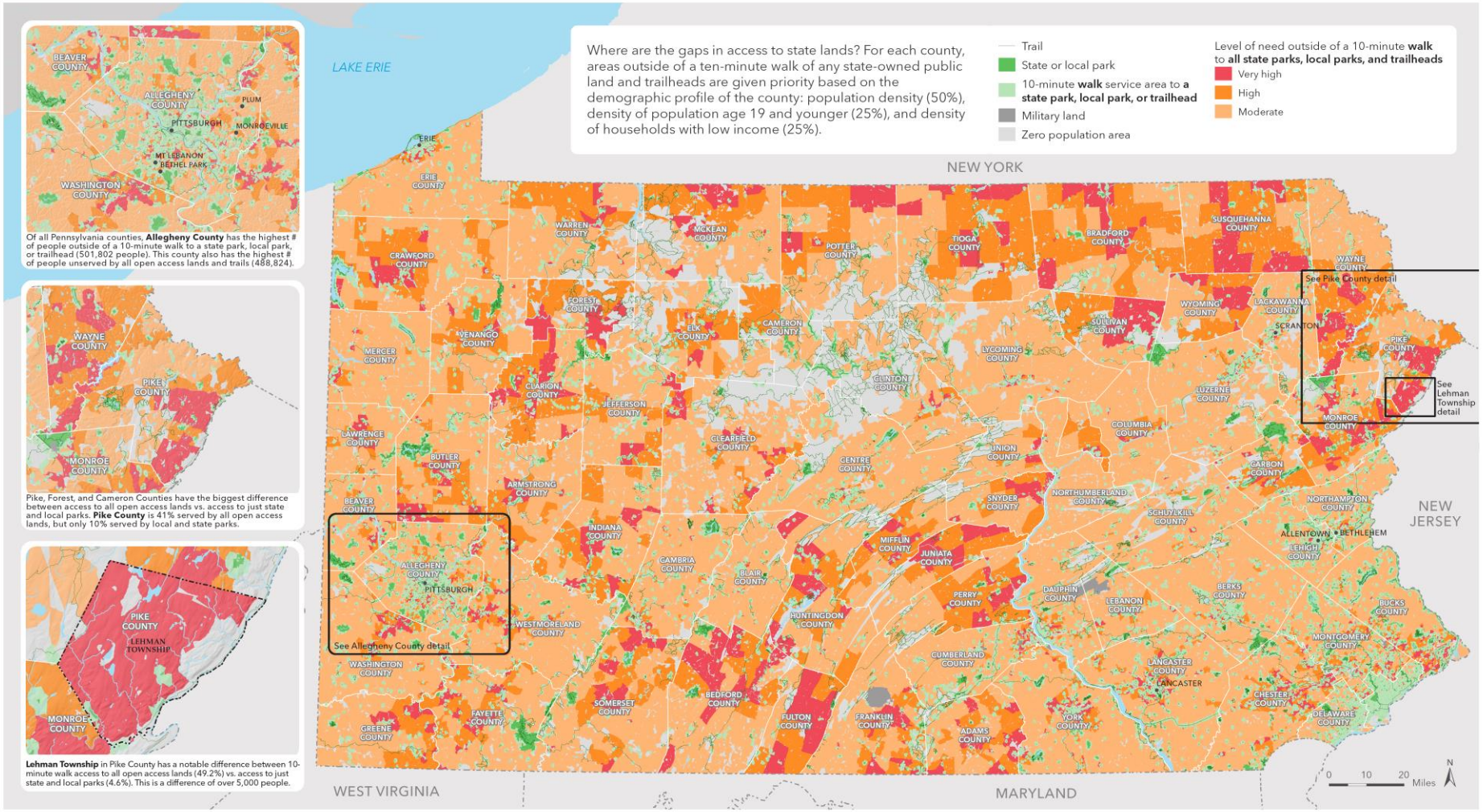
Figure 1: Level of need outside of a 10-minute walk to all open access protected lands, parks, and trailheads

State Parks, Local Parks, & Trailheads
10-Minute Walk Analysis

Introduction

Similar to the analysis described above, this map identifies areas outside of a 10-minute walk to parks and trails, and then prioritizes these areas based on population density, childhood population density, and the density of low-income households. This analysis differs in that it includes only state and local parks and trailheads, as DCNR outreach has confirmed that residents visit these sites more regularly. Federal lands and open access properties were excluded. The data and methods employed for this analysis were identical to those described above.



Level of need outside of a 10-minute **walk** to **all state parks, local parks, and trailheads**

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Figure 2: Level of need outside of a 10-minute walk to all state parks, local parks, and trailheads

Trailhead Access
10-Minute Drive Analysis

Introduction

This analysis determines the areas with the greatest need for trailhead access. It begins by identifying the areas that are not within a 10-minute drive to a trailhead and weights these areas based on demographic factors (see Measuring Need above).

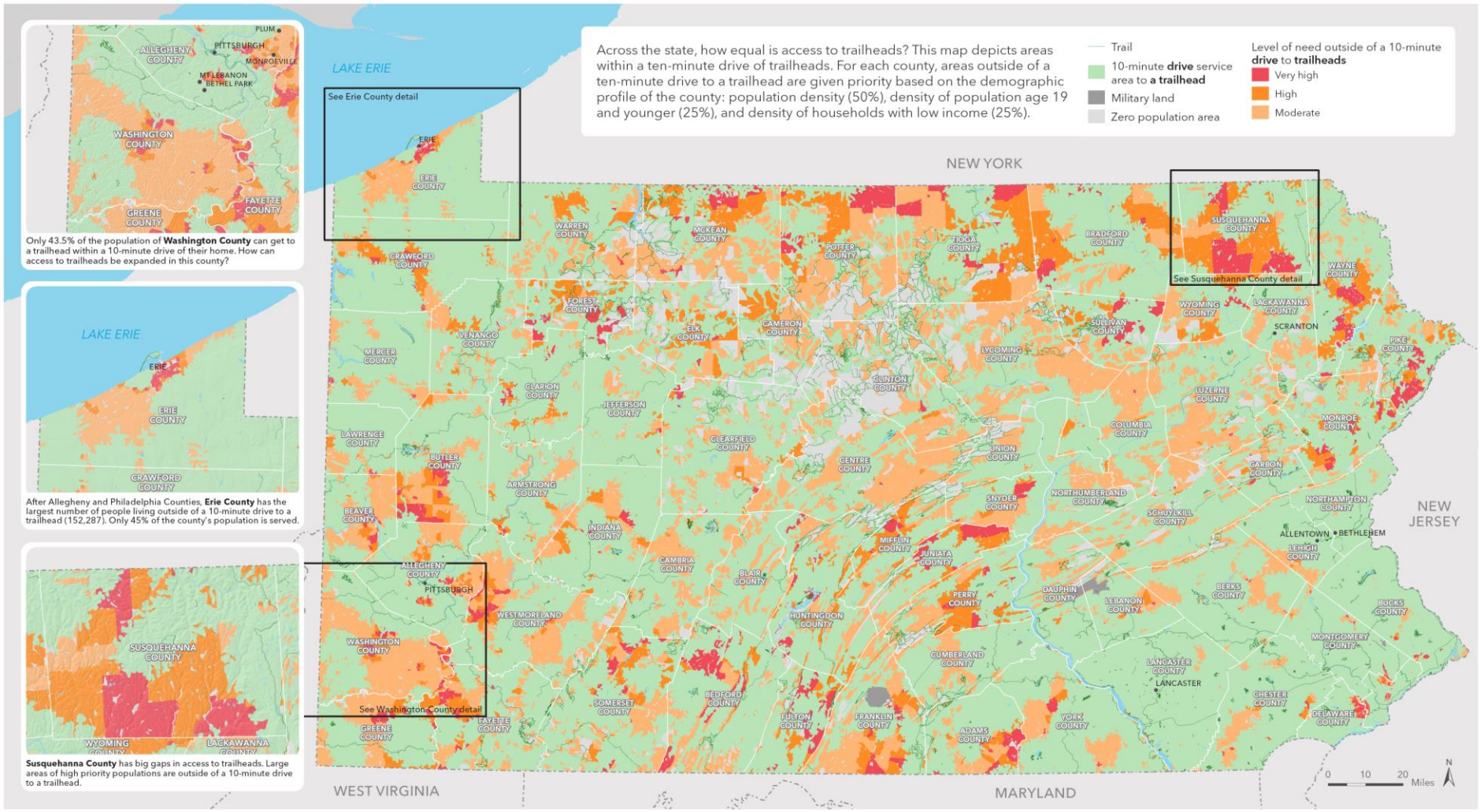
Data and Methods

Input Data:

- Within PA: Trailhead points were provided by PALTA using Explore PA Trails. PGC trails were also included. Three trailheads were removed: "Rausch Creek Off Road Park Trails," "Rock Run ATV Trails," and "Anthracite Outdoor Adventure Area Trails." These trails were removed for the same reason they were not included in the 10-minute walk analysis.
- Outside PA:
    - New York roads and trails data were used. New York trails data was provided by the New York State Department of Environmental Conservation (NYSDEC).
    - Protected Areas Database of the United States data version 1.4 (managed by the US Geological Survey) was used for all other states bordering PA.

Methods:

- Trailheads, PADUS lands, and roads and trails were buffered by 30m. The points at which these buffers met a road in the network was used as the input locations for the service areas. Street Map Premium was used as the road network to build the 10-minute drive service areas. In Network Analyst, the only restriction used was "driving an automobile."
- Some trailheads are farther than 30m from a road. These were extracted and buffered by 300m to create intersections with a road. The resulting service areas were appended to the original service areas. Some trailheads still did not have an access point, so this process was done a third time with 1000m buffers. After this third buffer was created, 81 of the PA trailheads did not have service areas. These are farther than 1 km from a road.



Level of need outside of a 10-minute **drive** to **trailheads**

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Figure 3: Level of need outside of a 10-minute drive to trailheads

Water Access
10-Minute Drive Analysis

Introduction

This analysis determines the areas with the greatest need for water recreation access. It begins by identifying the areas that are not within a 10-minute drive to a water access point and weights these areas based on demographic factors (see Measuring Need above).

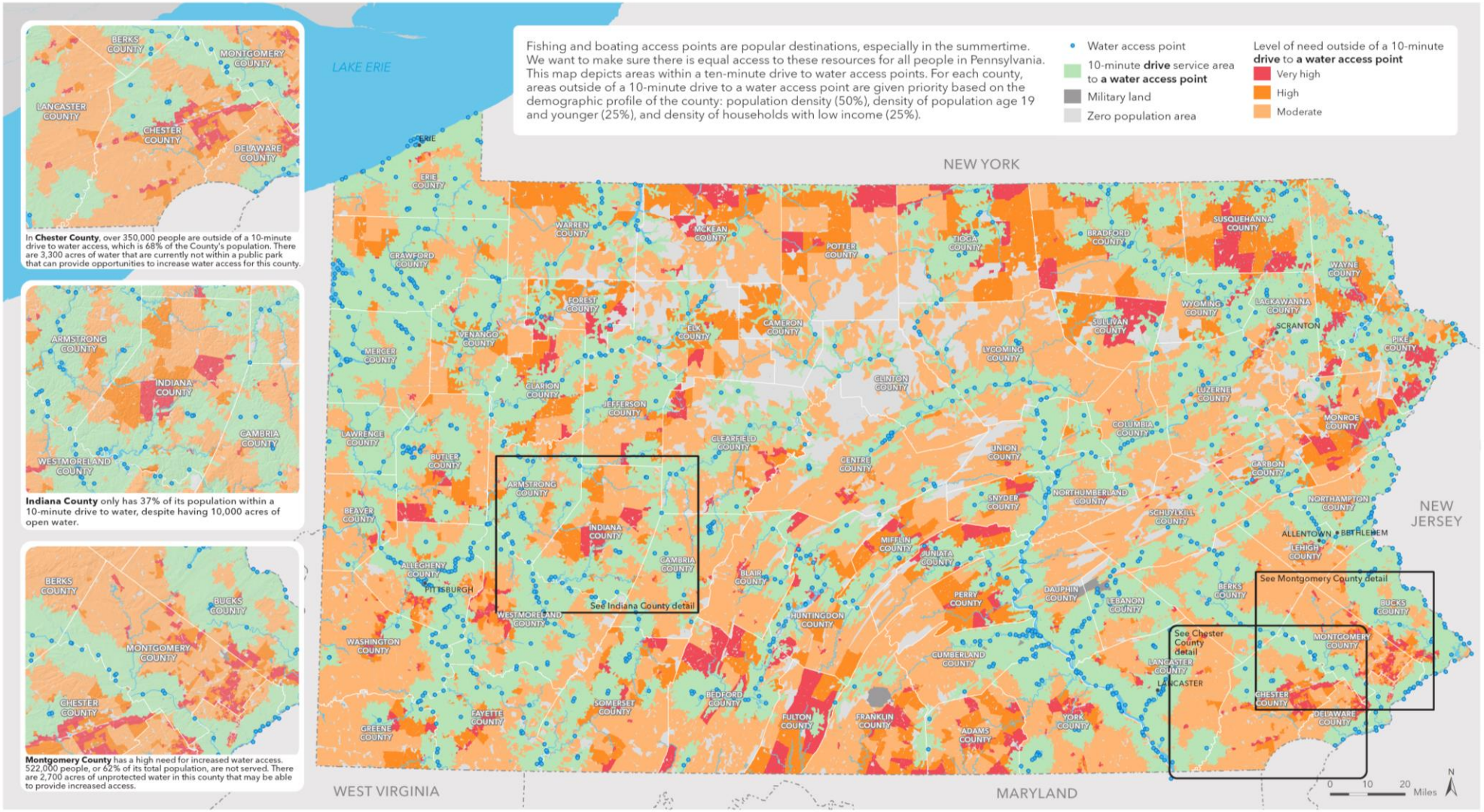
Data and Methods

Input Data

- Within PA the fishing boating access and water trail access points from Explore PA Trails and the PA Fish and Boat Commission were used.
- Outside PA:
    - In New York, boat launch points and public fishing parking sites were provided by PALTA using data assembled by NYSDEC.
    - Outside NY and PA no service areas were run because water access data was not available.

Methods:

- Water access points were buffered by 30m, and the points at which these buffers hit a road in the network was the input locations for the service areas. Street Map Premium was used as the road network to build the 10-minute drive service areas. In Network Analyst no restrictions were used except "driving an automobile."
- Some water access points are farther than 30m from a road. These points were extracted and buffered by 300m to get them to intersect a road then appended the resulting service areas to the rest of the service areas. Still some points did not have a road intersection, so this process was done a third time with 1000m buffers. At that point, every water access point in PA had a service area.



Level of need outside of a 10-minute **drive** to **water access points**

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Figure 4: Level of Need Outside of a 10-Minute Drive to Water Access Points

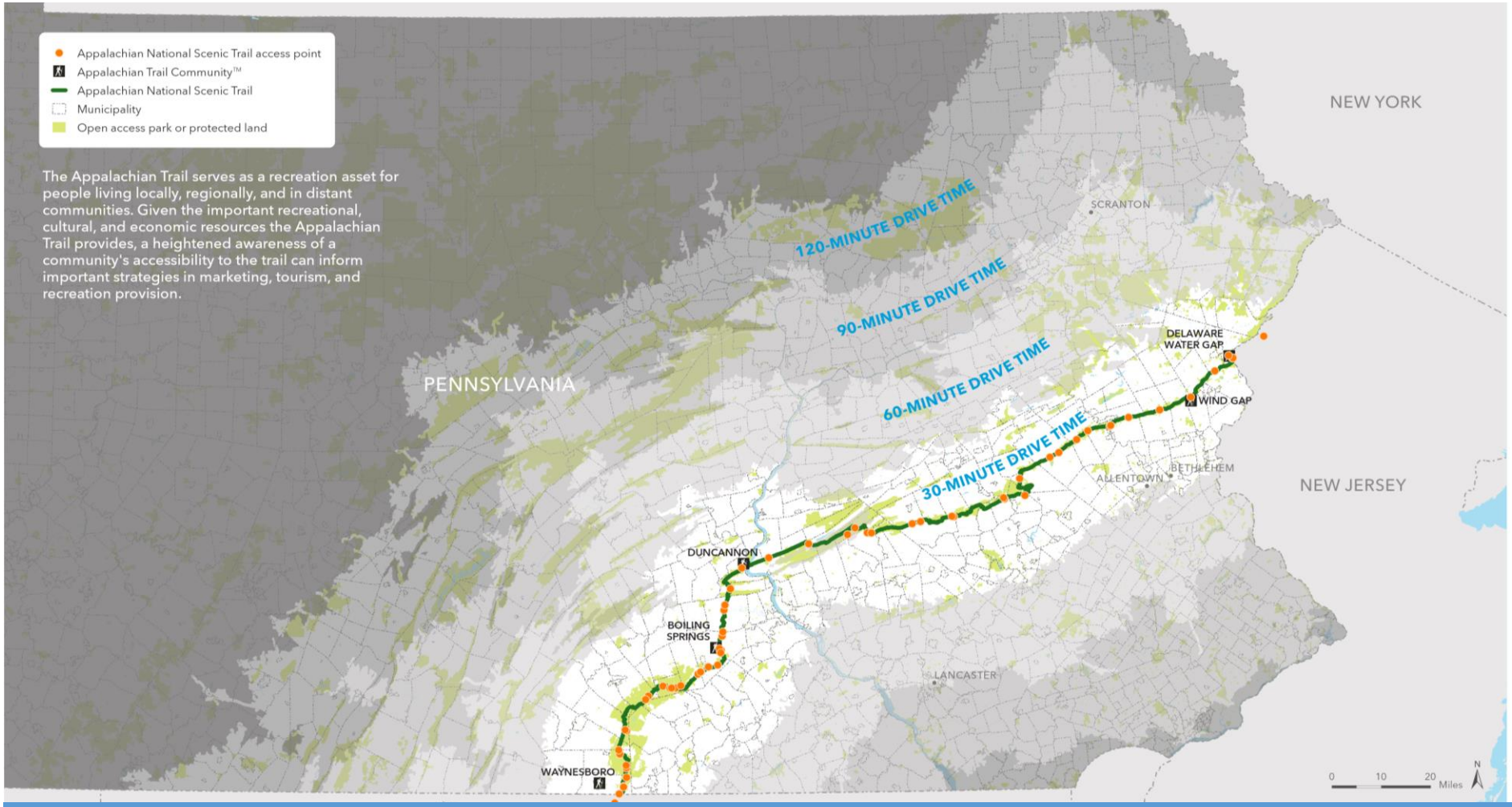
Drive Times to the Appalachian Trail

Introduction

This analysis categorizes communities based on their drive times to the Appalachian Trail, classifying communities into a 30, 60, 90, or 120-minute drive to the AT. The analysis can help to inform how DCNR promotes the AT to communities living close to the trail. It also has the potential to create a heightened awareness of a community's accessibility to the trail that can assist stakeholders in developing strategies for marketing, tourism, and recreation. The table below also helps stakeholders to understand the demographics of each of these service areas. Please note that the demographics for each service area exclude the smaller service areas within it. For example, the demographics of the 60-minute service area include only those areas that are less than a 60-minute drive to the Appalachian Trail, but also greater than a 30-minute drive.

Data and Methods

- Drive time service areas: 30-, 60-, 90-, and 120-minute drive times were calculated using Street Map Premium using drive time as the impedance value. In Network Analyst no restrictions were used except "driving an automobile." Appalachian Trail centerline and access points were provided by Explore PA Trails.
- Municipalities:
    - "DriveToAT" field was calculated by tagging municipalities with 30, 60, 90, or 120 if their centroid fell within that drive time. Null was assigned to municipalities that are outside of a 120-minute drive.
    - "Nearest_Miles" field was calculated using the Near tool to tag municipalities with the distance (in miles) to the nearest AT Access Point. "NEAR_FID" is the unique ID of the nearest access point to that municipality.



Drive Distance (Minutes)	Total Population	19 and Younger	Adults	Seniors	Low-Income Households	Medium-income households	High-Income Households	Less than High School Education	Linguistically Isolated Households	Population Under 5	Households without Vehicles	White	Black	Native American	Asian	Pacific Islander	Other Race	Two or More Races	Hispanic (ethnicity)
30	1,968,977	458,650	1,144,145	366,191	292,070	152,872	317,025	159,605	19,818	105,130	15,799	1,611,642	140,766	5,883	52,053	1,008	102,430	55,202	247,299
60	2,279,044	538,511	1,315,563	424,973	343,820	178,318	359,575	185,810	20,626	124,772	20,983	1,945,462	113,615	5,675	53,341	798	103,280	56,870	238,460
90	3,436,172	816,563	2,010,736	608,883	507,538	223,029	577,724	226,485	39,881	182,292	48,697	2,433,231	615,252	7,765	200,090	1,363	95,113	83,354	237,076
120	1,556,095	376,968	939,585	239,524	243,847	102,917	249,493	156,583	28,019	92,519	39,303	979,552	348,713	6,306	85,341	879	89,568	45,737	191,776

Figure 5: Drive Times to the Appalachian Trail with Demographics

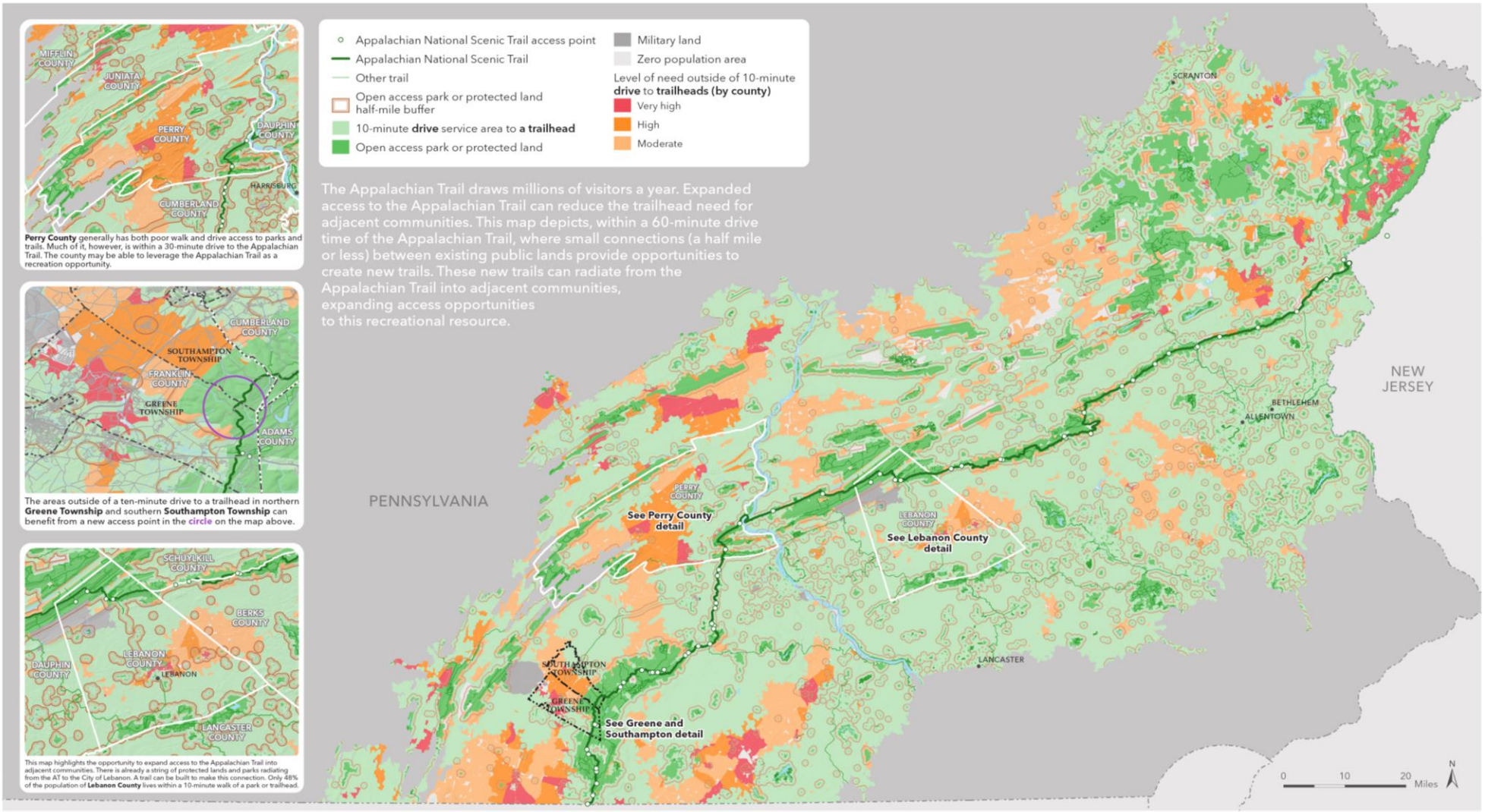
Appalachian Trail Connection Opportunities

Introduction

This analysis helps to identify opportunities for nearby communities to connect to the Appalachian Trail. It identifies areas where small connections (a new trail of a half mile or less) between existing public lands could reduce the need for trailheads and increase access to the AT.

Methods

- Only areas within a 60-minute drive time of the Appalachian Trail were used.
- Buffers around public lands: simple mile- and half-mile buffers were created around all open access lands. These help to visualize where connections to the AT can expand access into adjacent communities.



Appalachian Trail connection opportunities

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Figure 6: Appalachian Trail Connection Opportunities

Recreation Opportunity Spectrum

Introduction

The Recreation Opportunity Spectrum is a classification system developed by the US Forest Service and used since the 1970's to support planning on forest lands.[2] The Trust for Public Land adapted traditional methodology, primarily appropriate for forested lands in the Western US, to fit the landscape and local data in Pennsylvania. ROS classifies lands based on land use, a location's distance from roads, and the amount of human disturbance at the site. These classifications can help stakeholders to determine the potential recreation opportunities these lands can provide.

Two maps were produced using the ROS data. Figure 10 provides land classifications for all publicly accessible recreation areas in the state. This is useful for assessing existing resources and the potential for expanded recreational opportunity on those lands. Figure 11 provides ROS classifications for all other lands in the state. This is valuable for locating future recreational sites.

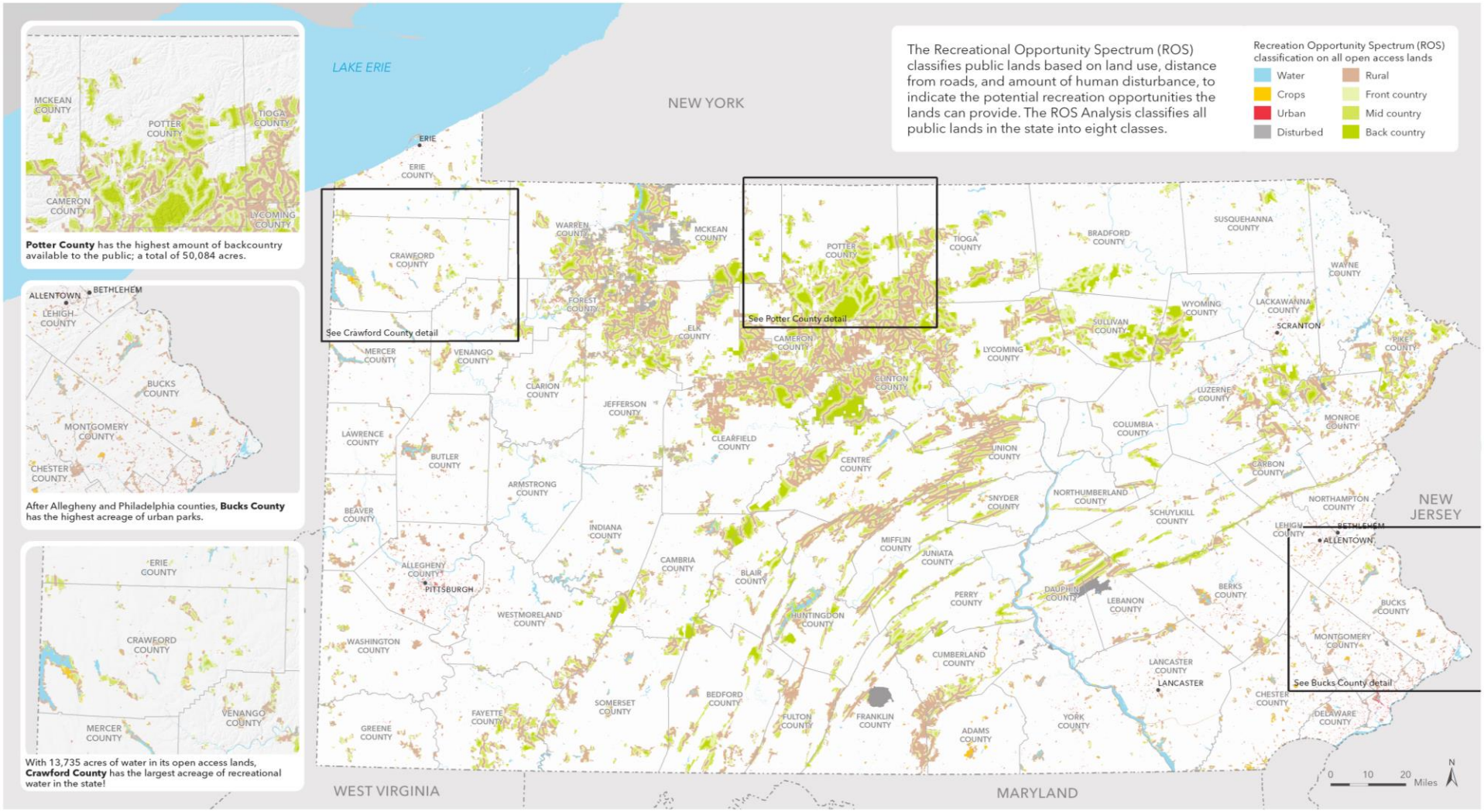
Methods

Table 1 provides an explanation for each of the ROS classifications. County statistics were calculated by combining on the ROS raster surface and a county raster surface we created. The resulting table gives pixel counts by each unique combination of county ID and ROS category. Pixels were converted to acres to get total acres of each category in each county.

Table 1: ROS Data Descriptions

ROS Class	Description
Urban	USDA Cropland urban designation (low intensity developed or greater)
Crop	Any crop designated in the USDA Cropland Data Layer
Water	NHD waterbodies, with swamp/marsh removed
Disturbed	Abandoned mine polygons, coal mining operation points buffered by 100m, and industrial mining operations buffered by 100m. Features were removed from the analysis if their status = remediated. Data source: PA Department of Environmental Protection (DEP)
Back Country	Greater than 2 miles from a high-volume road, greater than 1 mile from a local/low volume road, and greater than 0.5 miles from an unpaved road
Mid Country	Greater than a mile from high volume roads, greater than a half mile from local/low volume roads, and greater than a quarter mile away from unpaved roads
Front Country	Greater than a half mile from high volume roads, greater than a quarter mile from local/low volume roads
Rural	Within a quarter mile of local/low volume roads, and within a half mile of high-volume roads

[2] U.S. Forest Service. July 1, 2003. National ROS Inventory Mapping Protocol.



Recreation Opportunity Spectrum (ROS) classification on all open access lands

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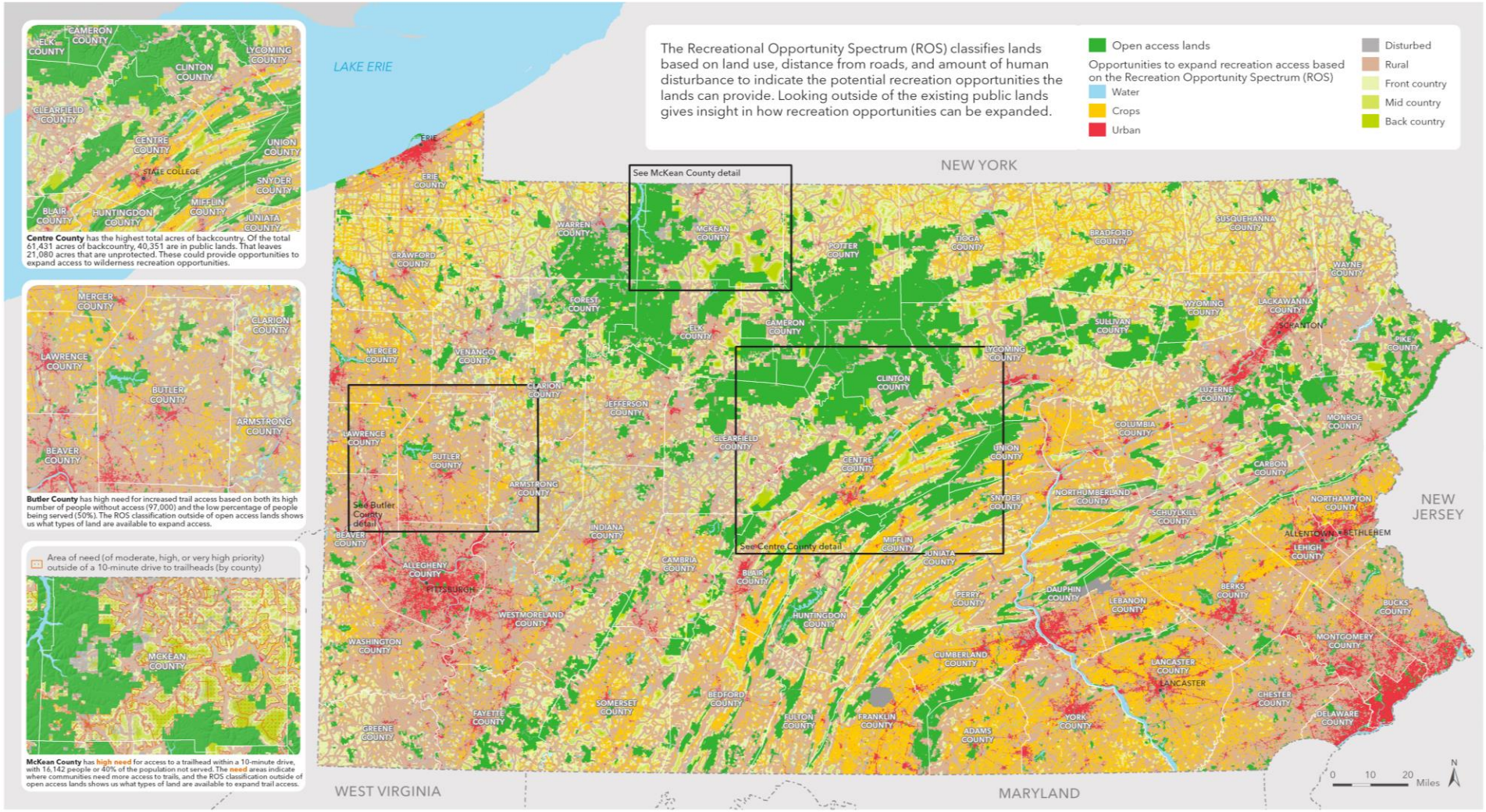
Figure 7: Recreation Opportunity Spectrum (ROS) classification on all open access lands



Opportunities to expand recreation access based on the Recreation Opportunity Spectrum (ROS)

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Figure 8: Opportunities to expand recreation access based on the Recreation Opportunity Spectrum (ROS)

Aligning Needs and Opportunities

Introduction

In order to help DCNR and other stakeholders get started using this data and to facilitate a discussion at the August 2019 Planning Meeting, TPL performed the following analysis using the results of the GIS methods described above.

The approach employed here was relatively simple. The GIS analysis related to access (10-Minute Walk to Parks, Trails, and Open Access Land, 10-Minute Drive to Trail Access, and 10-Minute Drive to Water Access) were used to rank the need of all Pennsylvania counties and/or municipalities. While the four access analyses were used to identify the counties with the highest need, the ROS data was used to identify opportunities for acquisition in high need, unprotected areas. For example, in the water access analysis, areas identified by the ROS as unprotected water were considered to be opportunities for the counties with the greatest need to acquire and develop additional water access points.

The analysis that follows is not intended to be an exhaustive list of recommendations, but rather to demonstrate one approach to locating opportunities within the areas with the greatest need, utilizing the access and ROS maps viewed in the previous section, as well as the accompanying data tables.

Ranking Need for Counties and Municipalities

While the access maps discussed above are intended to identify the highest need areas *within* each county, this section of the report utilizes the excel spreadsheets produced by TPL to draw comparisons *between* counties. The project team discussed the possibility of ranking counties solely based on the number of unserved people in each county (which tended to favor very urban counties, even when the vast majority of people were served) or by the percentage of the population that was unserved (which generally favored very rural counties with very low levels of access, even when new recreational sites would only benefit a small number of people). In the end, **the team decided to combine these approaches, scoring each county based on its rank in both the number of served people and the percentage of the population being served, and summing these two numbers into a need score.** The underlying assumption here is that if a county has both a high number of unserved people and a high percentage of its population without recreational access, it undoubtedly has great need. This is not the only way to rank need, and other approaches could be used in the future.

Access to Parks, Trailheads, and Open Access Land

Overall 53.1% of PA residents (6,903,129.00) have 10-minute walk access to recreational lands. Table 2 and Table 3 provide lists of the highest need counties and municipalities in the state, based on the analysis conducted for Figure 1, 10-Minute Walk to Parks, Trailheads, and Open Access Land. Some ROS data is provided for each county in order to offer a picture of the available back country, front country, and mid country opportunities. Please note that for this

analysis, these lands comprise only a fraction of the potential opportunities to increase access, since urban vacant land or rural land could also serve as suitable space for a local park.

Table 2: Highest Need Counties based on the 10-Minute Walk to Parks, Trailheads, and Open Access Land

County Name	Need Rank	Total Population	Total Population Unserved	Percent of Population Unserved	Back Country Acres (Private)	Mid Country Acres (Private)	Front Country Acres (Private)
Butler	1	192,150	144,243	75%	0	604	38,719
Westmoreland	2	360,394	242,253	67%	1,283	11,769	49,301
Adams	3	105,243	77,309	73%	0	692	15,813
Franklin	4	156,010	109,152	70%	0	13,803	41,497
Washington	4	212,875	142,977	67%	0	4,266	82,532
Monroe	6	171,973	115,782	67%	1,831	7,534	27,480
York	7	454,434	285,130	63%	0	1,724	30,523
Bradford	7	61,736	48,518	79%	3,548	35,209	243,497
Wayne	7	55,333	45,632	82%	868	16,644	134,985
Chester	10	526,546	308,878	59%	0	527	9,952
Somerset	10	75,455	56,063	74%	2,104	32,090	129,950

Table 3: Highest Need Municipalities based on the 10-Minute Walk to Parks, Trailheads, and Open Access Land

Municipality Name	Need Rank	County Name	Total Population	Total Population Unserved	Percent Unserved
Adams Township	1	Butler	14,412	13,590	94%
Hamilton Township	2	Franklin	11,128	10,606	95%
Center Township	3	Butler	7,934	7,662	97%
Antrim Township	4	Franklin	15,877	14,787	93%
Earl Township	5	Lancaster	7,231	7,012	97%
Jackson Township	6	York	8,338	7,989	96%
East Nottingham Township	7	Chester	9,179	8,737	95%
Washington Township	8	Westmoreland	7,345	7,076	96%
Montgomery Township	9	Franklin	6,275	6,103	97%
Newberry Township	10	York	16,821	15,345	91%
Windsor Township	11	York	18,541	16,849	91%
Kelly Township	12	Union	5,044	4,929	98%
Conemaugh Township	13	Somerset	7,000	6,664	95%
Conewago Township	14	York	8,083	7,581	94%
Salisbury Township	15	Lancaster	11,650	10,696	92%
Reading Township	16	Adams	6,001	5,755	96%
Ellwood City Borough	17	Lawrence	7,158	6,739	94%
North Codorus Township	18	York	9,183	8,466	92%
New Sewickley Township	19	Beaver	7,376	6,908	94%
Peach Bottom Township	20	York	5,243	5,056	96%

Trailhead Access Analysis

Statewide, 82% of Pennsylvanians (10,676,940 people) live within a 10-minute drive of a trailhead. Table 4 and Figure 9 list the counties with the greatest overall need for trail access (based on the ability to access a trailhead within a 10-minute drive) along with the availability of privately held front country, mid country, and back country land in each county, assuming that acquisition of these lands serves as the primary opportunities to expand the trail system.

This analysis was originally conducted using a 15-minute drive service area. However, as over 90% of residents live within a 15-minute drive of a trailhead, the analysis was not very useful for planning purposes, and so a smaller service area of 10-minutes was used.

One of the major takeaways is the overall lack of back country in any of the highest need counties, with the minor exceptions of Westmoreland with 1,283 acres and Wayne with 868 acres. New trail development in these counties will likely occur in front and mid country settings.

Table 4: Highest Need Counties: Trail Access

County Name	Need Rank	Total Population	Total Population Unserved	Percent of Population Unserved	Back Country Acres (Private)	Mid County Acres (Private)	Front County Acres (Private)
Erie	1	276,955	152,287	54.99%	116	12,016	110,361
Washington	2	212,875	120,282	56.50%	0	4,266	82,532
Butler	3	192,150	97,257	50.62%	0	604	38,719
Beaver	3	168,656	88,261	52.33%	0	37	14,031
Franklin	5	156,010	67,460	43.24%	0	13,803	41,497
Westmoreland	6	360,394	136,584	37.90%	1,283	11,769	49,301
Adams	7	105,243	40,366	38.36%	0	692	15,813
Allegheny	8	1,236,595	276,419	22.35%	0	22	3,947
Delaware	9	569,245	141,382	24.84%	0	1	112
Wayne	10	55,333	22,243	40.20%	868	16,644	134,985
Susquehanna	10	42,315	17,587	41.56%	121	21,349	197,631

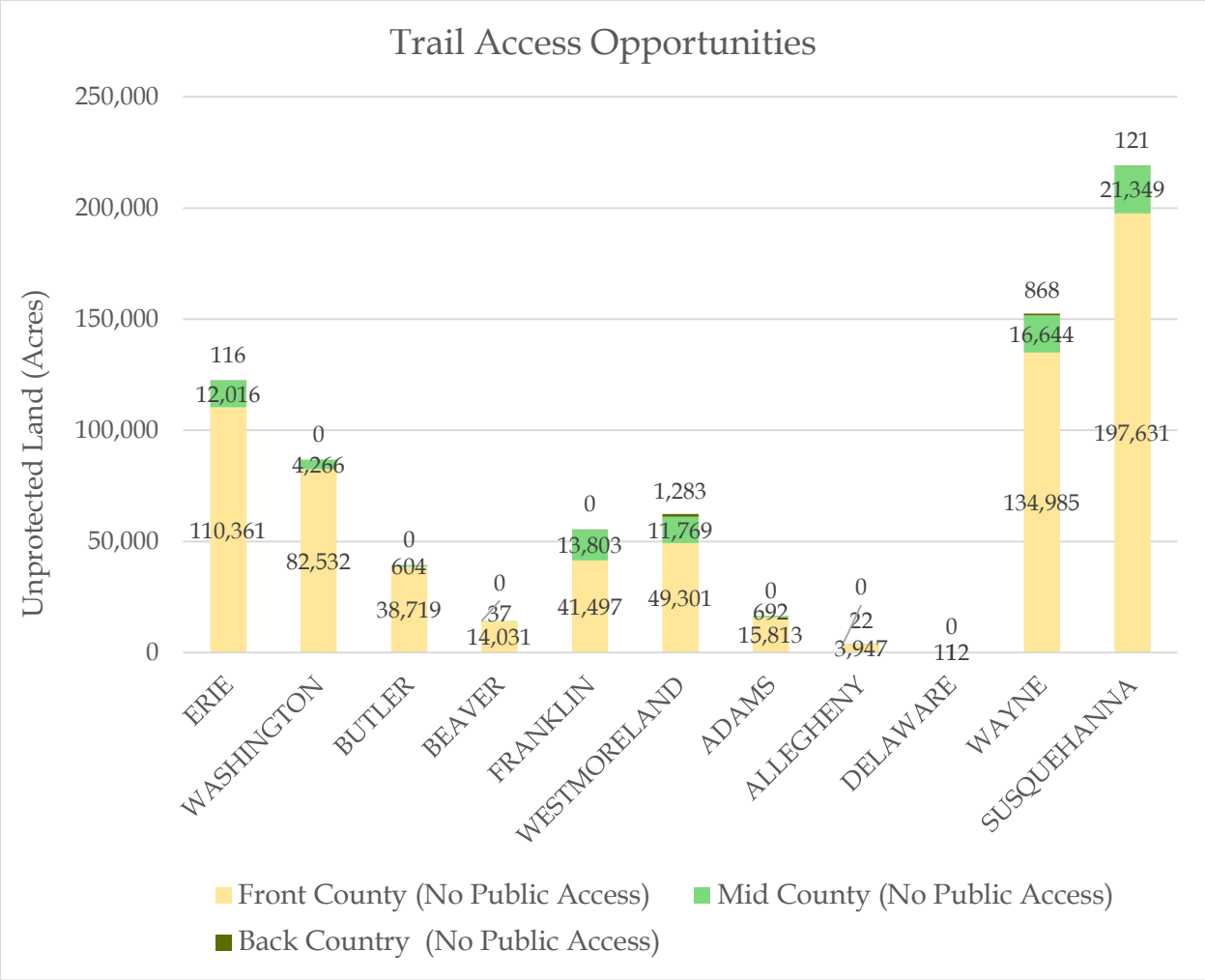

Figure 9: Trail Access Opportunities

Water Access Analysis

Statewide, 60% of residents live within a 10-minute drive to water access. Table 5 shows the counties with the greatest need for increased water access (based on the ability to access water within a 10-minute drive), as well as each county's available unprotected water. This comprises water that is not already within a protected area, and therefore provides opportunities to increase access. Although some counties possess substantially more than others, none of these counties is without opportunity, as all contain at least 1,000 acres of currently inaccessible water.

Table 5: Highest Need Counties: Water Access

County Name	Need Rank	Total Population	Total Population Unserved	Percent of Population Unserved	Water (Acres)	Protected Water (Acres)	Unprotected Water
Chester	1	526,546	361,397	68.64%	4,289	901	3,388
Franklin	2	156,010	140,982	90.37%	2,085	49	2,036
Montgomery	3	837,591	521,935	62.31%	3,808	1,182	2,625
Centre	4	166,313	127,913	76.91%	5,893	3,293	2,600
Delaware	5	569,245	337,113	59.22%	5,296	231	5,066
Adams	6	105,243	91,089	86.55%	2,655	254	2,401
York	6	454,434	261,194	57.48%	8,147	2,241	5,906
Blair	6	126,399	101,070	79.96%	1,565	166	1,399
Monroe	9	171,973	112,790	65.59%	7,282	1,088	6,193
Washington	10	212,875	114,987	54.02%	4,322	558	3,764
Butler	10	192,150	112,246	58.42%	6,328	3,544	2,783

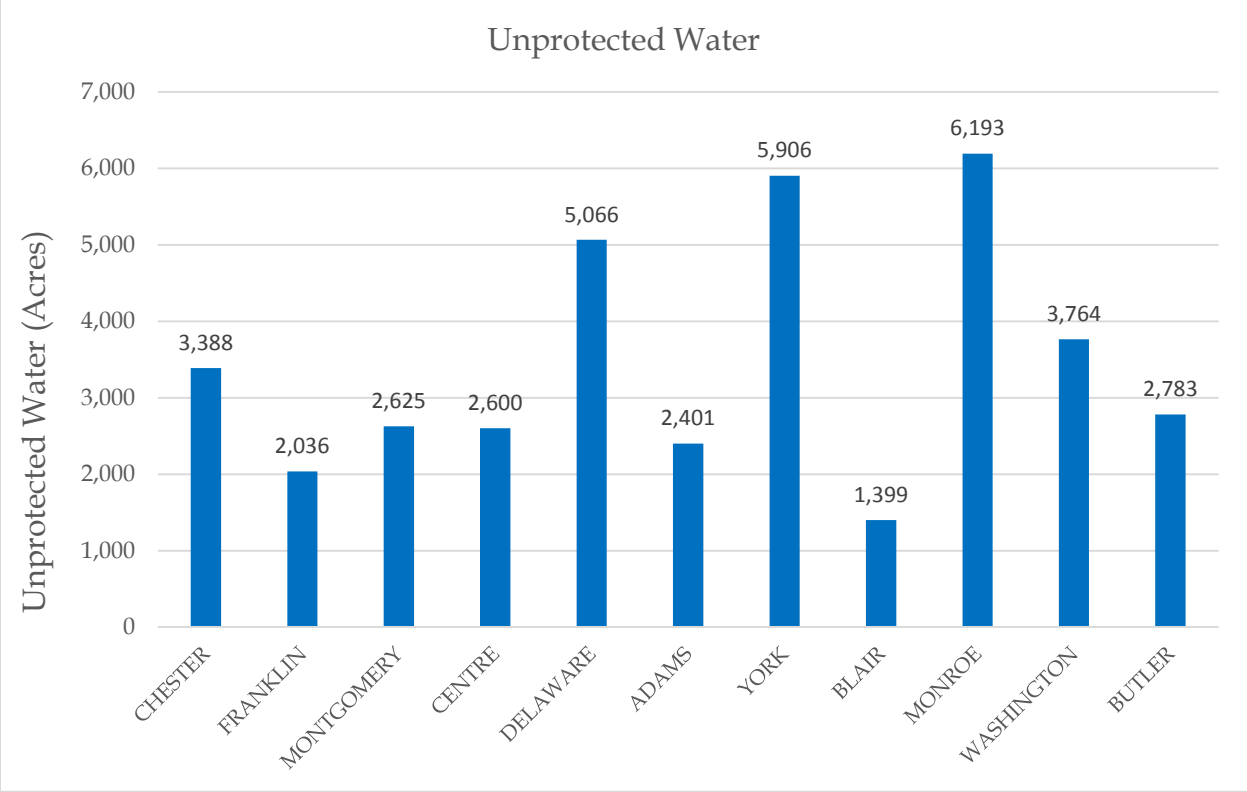

Figure 10: Unprotected Water in Highest Need Counties

Highest Need Counties Across All Analyses

The previous sections list the highest need counties for trail, water access points, and all open access areas. This is of course a long list of counties with a high level of need. The table below includes only those counties that appeared on all three of the need lists above. These are the counties where a new project could do the most to alleviate the need for water access, trails, and parks. Access improvements in the four counties are largely limited to opportunities to increase water access, as well as front country opportunities, with the exception of Franklin County, which also possesses some unprotected mid country. Back country is absent in all of these counties.

Table 6: High Need Counties across All Analyses

		Trails, Parks, and Open Access (10-Minute Walk)		Trails (10-Minute Drive)		Water Access (10-Minute Drive)	
County Name	Total Population	Total Population Unserved	Percent of Population Unserved	Total Population Unserved	Percent of Population Unserved	Total Population Unserved	Percent of Population Unserved
Butler	192,150	144,243	75.07%	97,257	50.62%	112,246.00	58.42%
Adams	105,243	77,309	73.46%	40,366	38.36%	91,089.00	86.55%
Franklin	156,010	109,152	69.96%	67,460	43.24%	140,982.00	90.37%
Washington	212,875	142,977	67.16%	120,282	56.50%	114,987.00	54.02%

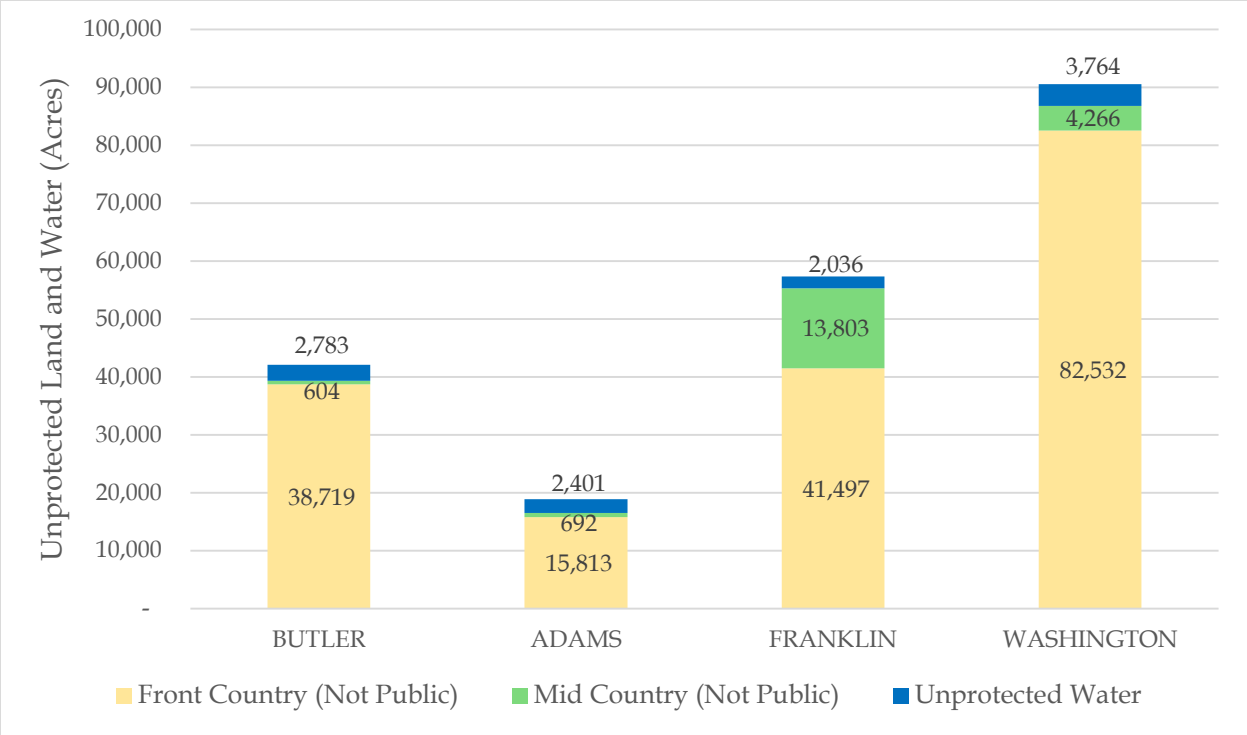

Figure 11: Unprotected Land and Water in High Need Counties based on all Three Analyses (Trails, Water, Public and Open Access Lands)

Park Equity Observations

The excel tables created from this study's GIS analysis were also used to identify counties with major challenges related to equity in recreation planning. Please note that TPL has provided these excel files to DCNR and PALTA to aid in their future analysis.

This analysis involved comparing the recreation access rates between historically marginalized groups and non-marginalized groups along both racial and economic lines. In the vast majority of counties, lower income residents and people of color have greater recreational access than their higher income, white counterparts in the same county. This was almost completely the case with regards to the 10-minute walk analysis, examining the analyses of access to both all recreational sites and when including only state and local parks. This is likely due to a greater prevalence of higher income, white residents living in rural and suburban parts of these counties, with fewer parks and lower walkability due to low density land use patterns and non-grid street layouts. Equity-related issues occurred more frequently when examining 10-minute drive statistics for both water access and trailhead access. These differences occurred occasionally along economic lines, but more frequently along racial lines. In the instances where these differences exceeded 9%, they are shown below and marked in yellow highlighting.

Access to parks, trails, and open access lands

Statewide, 53.1% of residents have 10-minute walk access to parks, trailheads, and open access lands. Access rates were higher for low-income residents (60%) than for high-income residents (49%) and were higher from black (81%) and Hispanic (75%) residents than they were for white residents (47%). Only five counties exhibited lower access rates for marginalized groups greater than 9%, marked below in yellow. These happened exclusively along racial lines, rather than based on economic differences. Union and Clearfield Counties exhibited the greatest differences between white residents and both black and Hispanic residents.

Table 7 Equity and Recreation Access (Parks, Open Access Areas, and Trails)

Community Name	Total Population	Total Population Served	Percent of Population Served	Total White	White Percent Served	Total Black	Black Percent Served	White Served - Black Served	Total Hispanic	Hispanic Percent Served	White Served - Hispanic Served
Union	45,405	15,970	35%	39,073	38%	3,551	13%	25%	2,831	20%	18%
Clearfield	81,843	22,162	27%	76,975	28%	2,279	13%	15%	2,642	17%	11%
Huntingdon	45,875	17,680	39%	41,825	39%	2,590	27%	12%	995	30%	9%
Greene	37,681	9,410	25%	35,409	25%	1,260	14%	12%	572	18%	8%
Carbon	64,340	25,998	40%	60,851	41%	1,246	26%	14%	3,113	41%	0%

Trailhead Access

On a statewide level, 82% of residents have trail access. Access sits at 83% for low-income populations and high-income populations, 83% for white residents, 76% for black residents, and 86% for Hispanic residents. Trail access statistics exhibit some minor equity related trends related to economic factors, and more substantial trends related to race. Table 8 below summarizes these findings, with equity related differences over 9% highlighted in yellow.

Table 8 Equity in Trailhead Access

	HOUSEHOLD INCOME								RACE/ETHNICITY						
County Name	Total Population	Percent of Population Served *	Total Low-Income	Low-Income Percent Served	Total High-Income	High-Income Percent Served	High-Income - Low-Income	Total White	White Percent Served	Total Black	Black Percent Served	White Served - Black Served	Total Hispanic	Hispanic Percent Served	White Served - Hispanic Served
Erie	276,955	45%	38,487	42%	34,275	48%	7%	238,447	48%	20,985	18%	30%	12,297	27%	21%
Philadelphia	1,591,765	83%	267,882	81%	269,856	88%	6%	618,922	95%	673,651	72%	22%	243,837	76%	19%
Lebanon	141,970	74%	22,181	69%	20,819	79%	9%	124,161	75%	3,994	65%	11%	20,182	58%	18%
Clinton	39,461	64%	5,722	68%	7,116	67%	-1%	37,844	65%	638	48%	17%	618	52%	13%
Delaware	569,245	75%	73,270	71%	74,618	81%	10%	387,297	83%	125,206	56%	27%	22,876	70%	12%
Fayette	135,368	73%	23,545	74%	24,351	74%	0%	125,151	74%	6,315	63%	11%	1,781	65%	9%
Pike	56,600	72%	7,572	72%	9,245	74%	2%	49,320	73%	3,421	59%	14%	6,315	64%	9%
Mercer	114,176	80%	16,302	80%	22,221	83%	3%	103,637	82%	6,765	54%	28%	1,765	75%	7%
Perry	46,979	71%	7,211	73%	6,951	73%	0%	45,233	72%	441	59%	13%	1,043	69%	2%
Washington	212,875	43%	36,787	35%	34,013	50%	15%	198,143	44%	6,703	26%	18%	4,047	43%	1%
Northumberland	93,128	83%	15,458	86%	17,406	81%	-5%	87,154	83%	2,416	68%	14%	3,544	89%	-7%

Water Access

On a statewide level, Pennsylvania does not face major equity-related issues related to water access. Overall, 60% of Pennsylvanians have water access within a 10-minute drive of their home. Low-income residents are served at a rate of 64%, compared to 59% for high-income residents. While 59% of white residents are served, this number is 69% for black residents and 70% for Hispanic residents. Despite positive statewide trends, there are a small number of counties showing inequity in access. The more substantial equity-related trends relate to race rather than economics, with water access for white residents occurring at higher rates than black and Hispanic residents in several counties. Table 9 summarizes these findings, with equity-related differences over 10% highlighted in yellow.

Table 9 Equity in Water Access

County Name	Total Population	Total Population Served	Percent of Population Served	Total White	Percent White Served	Total Black	Percent Black Served	White Served - Black Served	Total Hispanic	Hispanic Served	Hispanic Percent Served	White Served - Hispanic Served
Clearfield	81,843	38,522	47%	76,975	48%	2,279	39%	9%	2,642	498	19%	29%
York	454,434	193,240	43%	391,631	45%	28,225	20%	26%	35,695	8,756	25%	21%
Greene	37,681	17,783	47%	35,409	48%	1,260	23%	25%	572	198	35%	14%
Carbon	64,340	45,157	70%	60,851	71%	1,246	33%	38%	3,113	1,802	58%	13%
Centre	166,313	38,400	23%	143,976	25%	6,443	9%	16%	5,137	617	12%	13%
Indiana	87,428	32,450	37%	82,591	38%	2,209	12%	27%	1,168	331	28%	10%
Philadelphia	1,591,765	1,168,761	73%	618,922	78%	673,651	69%	9%	243,837	166,816	68%	10%
Wayne	55,333	31,974	58%	51,413	59%	1,990	38%	21%	2,617	1,354	52%	7%
Blair	126,399	25,329	20%	120,411	20%	2,372	9%	12%	1,729	276	16%	4%
Northumberland	93,128	62,722	67%	87,154	67%	2,416	54%	13%	3,544	2,727	77%	-10%

Planning Meeting Notes

In August of 2019, TPL and DCNR convened a group of stakeholders to discuss this effort. Appendix 2 includes a list of the stakeholders who participated in meeting. TPL Research and Innovation staff presented the analysis methods and resulting maps to the group, as well as the prioritization analysis described above. Participants from Dauphin and Lancaster Counties were provided with factsheets for their counties (see Appendix 3). Following a review of the data, participants discussed topics related to the analysis, brainstorming potential uses and users for the data, methods of sharing the data with other stakeholders, and additional GIS analysis that could be conducted in the future. Key takeaways are grouped by topic and summarized below.

Sharing the Analysis

- DCNR needs to have a strategic approach to delivering data to all levels and abilities that is easily digestible and understandable
    - Share the GIS data with organizations that have GIS capacity
    - Create web maps and infographics for users who do not have GIS capabilities
- Share the results over social media
- Hold webinars to inform and educate potential users about the data, in particular possible DCNR grant applicants
- Invite community members (possibly in partnership with the school districts) to "ground truth" the data and access points to create walkability assessments or other products
- Present the findings at conferences (e.g. Central Pennsylvania GIS Day, Pennsylvania Recreation & Park Society's Annual Conference, Statewide Greenways and Trails Conference)
- Develop factsheets and infographics highlighting outdoor recreation access for new homeowners, school districts, and county travel bureaus

Using the Analysis

Park, Trail, and Open Space Planning

- Pennsylvania Department of Community and Economic Development (DCED) could use the data in their Land Use Reports, for policy decisions, reaching out to legislators, and for education and outreach
- Provide the data to land trusts and local municipalities to help them prioritize conservation projects

- TPL could use this data to advocate for certain investments, and to educate policy makers on the level of need
- DCNR could use the data to balance recreation opportunities on their land base with those statewide
- Pennsylvania Fish and Boat Commission (PFBC) could use the water access map to prioritize easements/acquisitions along waterways
- Land trusts and conservation organizations could create new preserves that include public access based on the data

Partnering with Private Landowners

- Look for additional public/private partnerships with private landowners to allow for access
    - Pursue partnerships with timber companies allowing for recreation opportunities in the north-central area of the state.
- Incentivize recreation development for private landowners, offering tax breaks and greater liability protection

Funding Opportunities

- Work with underserved communities to develop projects in high need areas (NPS Rivers, Trails & Conservation Assistance)
- Overlay the current DCNR grant data with this data to identify high need areas that are not receiving support
- Review grant requirements to locate needs across the state and align priorities to better serve those communities
- Use DCNR's Conservation Landscapes and other organizations who partner and collaborate across a landscape to advance a regional response

Collaborating with Local Planning Authorities

- The analysis provides a cost savings to local communities by allowing county level planners to add to their data resources
- More could be done to advance multi-municipal cooperation and work
- Offer planning incentives to make state, county, and local planning more consistent with one another and incorporate this data into the plans
- Look at the opportunities within communities that may have begun development and then stopped
- Pursue brownfields restoration and continue the brownfields to playfields pilot

Economic Development

- DCNR could add an economic development component to the grant application processes
- Outfitters and tourism organizations will be interested in creating additional access to parks, trails, and open space and will also want to take advantage of existing opportunities
- There is a direct connection between clean water, clean air, clean land, and quality products (e.g. higher quality foods)
    - This could help businesses to capitalize on the business/product quality component
- Trail networks can be an economic boon to the communities through which they pass. For example, the Northwest River Trail has had a positive economic impact to businesses in Lancaster County

Transit and Mobility

- Use the results to assess how to use public transit to create transportation opportunities to recreational access points
- Collaborate with PennDOT to incorporate some signage and safety improvements along rural roads leading to recreation access points

Potential Future Analysis

Incorporating Other Data

- Incorporate environmental justice and displacement into the analysis, and consider these elements in prioritizing future investments
- High need areas that currently have a trail (but no trail access) are "low hanging fruit" and should be identified
- Work with other state agencies and partners overlaying the 10-minute walk/drive data with their data
    - The Department of Health can overlay their obesity and diabetes information with this recreation analysis to test for correlation and to identify high need areas
- Incorporate data from the National Outdoor Recreation Needs Assessment to explore opportunities for DCNR to coordinate with national parks in order to provide better visitor management and the sharing of resources
- Overlay this data with expenditures in outdoor recreation access and economic activity

Improving the Data

- 2,000 school sites in the state are missing from this analysis because there was no confirmation of recreational access

    - In the future, it is important to collect this data and incorporate it, particularly in high need counties
    - In rural Pennsylvania, school grounds are sometimes the only access
- Identify areas lacking safe access to parks via walking or biking
- Increase collaboration between the state and the counties to confirm that the data is valid and add any missing parks, trails, or open space
- Expand the analysis in future SCORPs to consider recreation providers' capacity to maintain existing infrastructure, the types of infrastructure that should be maintained (for instance, parking lots versus ball fields) and the economic and environmental impacts of recreation
- To ensure the quality of the data, update it regularly with new parks, trails, and water access, repeating the analysis every five years
- Funding for the state data housing authority is needed
- Require that grantees provide updated GIS data as part of the grant process
- Further break out different types of recreation (e.g. hiking, equestrian, ATVs)
    - Different people in different regions participate in different activities
- Further collect/develop data on how many people are using different DCNR facilities and for what use, and incorporate into these GIS results
- Consider changing the weighted demographic from density of children to density of senior citizens to measure how connected those populations are and help to better connect the aging population to outdoor access.
    - This can be used to get seniors active and possibly start a discussion about indoor facilities, with senior centers connecting to trails and parks

Other Recommendations

- Prioritize river access along state roads with bridges
- Encourage joint use agreements with schools in high need counties
- There needs to be a balance between investing in existing resources and creating new resources
- Develop partnerships with county/municipal leaders and planners to see where their needs match up with access map data, and engage local officials in decision making
    - Some populations live in rural areas because they do not have amenities like parks

- Focus on providing access based on socioeconomic status. Create access for the underserved, particularly Environmental Justice communities, communities with Title 1 status, or based on other demographic factors (e.g. health factors such as obesity rates).
- Prioritize protecting land near larger populations, rather than areas with a lot of existing backcountry.
    - Many people in urban environments just want some kind of green space.
    - It does not have to be technically "backcountry" to provide a backcountry-type experience

Other Observations and Reflections

Access

- Recreation providers are not keeping up with creating or maintaining access to outdoor recreational opportunities in quickly developing areas
- Rural areas generally have less access, especially the northern tier and the southern tier
- People with cars generally have the greatest access
    - For people who require ADA accessibility walking and driving may not be relevant

Economic Development

- Using our water assets to encourage economic development is an opportunity.
- Collect data from CLI's on tourism and economic development and the investments they make in marketing and visitors

Conclusions

The information in this study is useful to DNCR, as well as local governments, the US Forest Service and National Park Service, nonprofits, and economic development organizations. To be utilized to its full potential, the data must be shared broadly with a diverse group of stakeholders. This report provides some examples of how this data could be used. However, only by wide distribution of the data can it be most effective.