
Draft Master Development Plan - Part 2
Recommendations

Furnace Run Park



Prepared for:

Township of Southampton

705 Municipal Drive
Shippensburg,
Franklin County, PA

Revision 1
April 2021

Furnace Run Park
Township of Southampton, Franklin County

Master Development Plan Part 2: Recommendations

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Prepared for the
Township of Southampton

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Photograph of a nature play area constructed primarily by volunteers using locally collected natural materials. The township envisions construction of a similar play area in the first phase development of Furnace Run Park.

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Trail construction will be a main focus of the early phases of development of Furnace Run Park. This photograph illustrates a main connecting trail that would be the highest level of trail development.

EXECUTIVE SUMMARY

This document outlines the approach, purposes and methods of public engagement for the development of a Master Development Plan for the Furnace Run Tract in the Township of Southampton, Franklin County, Pennsylvania.

“What Southampton Township does have includes a vast array of natural resources that are attractive in a different manner and to a different cross-section of the population than other development-related amenities. Resources such as ample open space, passive recreation opportunities, a lush and green environmental landscape, a vibrant agricultural economy, and the area's inherent rural and bucolic setting provide an excellent base for the Township to build on in attracting a new segment of society.”

2015 Southampton Township Comprehensive Plan

6.0 COMMUNITY ENGAGEMENT

6.1. Focus of Public Engagement

The Request for Proposal issued by the Township for this project stated “The purpose of this land is to create a natural park with open space, passive enjoyment, trails and provide natural education.” It will be the duty of B&L and PTL to ensure that in the development of our support materials the public engagement will be focused on ideas that are compatible with this objective.

In addition, the RFP stated that the Master Development Plan should, “Include recommendations and requirements to provide safety and accessibility to the citizens and emergency services...[and] accommodations for special needs or disabilities.”

6.2. Engagement Approach

Effective methods of public participation go beyond the traditional goal to inform the public. We firmly believe that a meaningful public participation process is necessary to shape any planning effort and foster community support and ownership of the resulting vision. B&L/PTL share an approach to public engagement that is driven by four principles:

- Inform
- Involve
- Empower
- Consult

Applying these principles in a manner that provides enjoyable events for the community while collecting the information our designers need for their work.

6.3. Covid-Related Adaptations

Public engagement was challenged due to the Covid-19 limitations for direct contact with the public, and for large gatherings. For this reason, project team relied on other emerging techniques to achieve contact with the public leveraging social media, web-based outreach techniques and web-based video conferencing.

6.4. Engagement Techniques

The following techniques were utilized for public engagement during the development of the Master Development Plan. These techniques provided non-traditional pandemic-safe public participation.

- 6.4.1. Web-Site Updates and Project Links – Links to project information was made available at the Township, Borough of Shippensburg and Shippensburg Community Parks & Recreation Authority (SCPRA) websites. Links to project information and deliverables were also posted on social media site including the SCPRA and Southampton Township’s Facebook accounts.
- 6.4.2. PAC Meetings – The Township assembled a Project Advisory Committee (PAC) to provide input throughout the Master Plan development process. PAC meetings were held in person and via ZOOM video conferencing to maximize time and input at key stages in the project. These meetings were recorded and the recording posted on the various web pages. Meetings were scheduled to provide an initial review of the consultant efforts at each of the key stages of the project including:
- Following data gathering and analysis;
 - Following the analysis of public engagement efforts;
 - Upon completion of the initial Draft Master Development Plan.
- 6.4.3. Project Branding – We strongly believe in the value of branding projects to make them more recognizable to the community at large and to foster enthusiasm during the planning process. The project developed an initial logo design that incorporated some of the key elements of the park in the context of South Mountain.
- 6.4.4. Stakeholder Interviews–The team conducted a series of stakeholder interviews to better understand the issues and opportunities associated with the future park development. The interviews were conducted by phone or video conferencing. Interviewees were provided with a project description and objectives for the master plan and then asked a series of questions about needs for programming at the park, if/how they can lend assistance with park improvements, and general thoughts on needed nature park facilities. Interviewees included:
- 6.4.5. Public Survey–The project team prepared an on-line survey using a ‘Survey Monkey’ web-based service along with a companion hard-copy survey to reach more people who otherwise might not have the interest. A total of 261 responses were received over the months of December and January. Volunteers from the PAC appended hard-copy response data to Survey Monkey data. 11 survey questions were included and questions focused on suggested responses that compatible to the Township’s stated objectives for the nature park. Links to the online survey were posted on the Township’s Facebook page, the SCPRA website as well as advertised in press releases, outreach flyers and public information webinars. Survey results are included in the appendices.

- 6.4.6. Local Press—A series of articles provided periodic updates will be provided throughout the Master Development Planning project. While there are limited widely distributed local publications, two local newspapers published information. The Shippensburg News Chronicle is reportedly read by many local seniors and was a key source of project information to seniors. The Shippensburg Sentinel published project updates and posted them on their webpage interface.
- 6.4.7. Final Public Meeting—Once the Preferred Alternative is developed with input from the PAC, it will be presented to the public. Special invitations will be made to local stakeholders and elected officials. The B&L/PTL team will present the specifics of the Preferred Alternative and facilitate a discussion with those in attendance.

Due to the post-holiday spikes nationwide in Covid-19 cases, it was determined that in person outreach could not be conducted for the project. As a result, there was no opportunity to conduct planned in-person workshops, open house events and ‘walk-shop’ tours of the park site.

6.5. SUMMARY OF PUBLIC ENGAGEMENT RESULTS

Public input obtained through advisory committee meetings, webinar chats and Q/A, a public web survey and stakeholder interviews was used to refine the master development plan. Various materials including:

- Webinar PowerPoint Presentations;
- Webinar chat and questions and answers;
- Outreach flyers;
- Survey questions and compiled survey results and analysis;
- Stakeholder interview notes.

- 6.5.1. Web-based 2020-21 Survey Results – A web-based survey was conducted which asked 11 questions of those taking the survey. The survey was opened in mid-December and remained active until mid-February. Results were compiled and analyzed, then presented during the second public webinar in February. Key take-aways from the survey included:

- There is great local interest in the park, particularly among Southampton Township, Franklin County residents;
- Large local parks were reported as being used regularly among survey respondents and people are generally satisfied with the local facilities;
- Most of the survey respondents were not discouraged from using local parks and felt they were well cared for, but expressed a need for more resting places, better signage, more interesting trails;
- The primary mode of travel to local parks is by automobile, however many also walk or bicycle to parks as well;

- Few responses indicated a perceived transportation barrier to existing local parks;
- The perceived community recreation needs and desires for the new park facility indicated that a place for family and friends, connect with nature and enjoy the scenic beauty is the greatest need;
- The community also seeks a place where they can keep healthy and fit;
- A social trail experience is desired with opportunities to enjoy views of the water resources, stop at resting places and access conveniently located amenities;
- The most desired programs for the park included recreational programs, nature programs and health and wellness programs;
- One question ask respondents to give a value of 1 for not critical up to a value of 5 for critical to a list of uses and facilities for Furnace Run Park, as a result 80% or more of the survey respondents felt that accessible facilities, hiking trails, areas to relax and enjoy views and nature trail were critical or important and on the other end, considered less critical such as community gardens, amphitheater, and Visitor Center/Museum;
- An overall analysis of the survey indicates a strong correlation to the Township’s stated goal to develop Furnace Run Park as a Nature Park.
- There was a strong negative community response to use of the park as a large community agricultural site.

6.5.2. Webinars – Two web-based public webinars were conducted for the project utilizing B&L’s Zoom Webinar platform. The webinar slide decks were reviewed during meetings with the Township and Project Steering Committee a few days prior to the public presentation. The webinars were recorded and copies of the recordings provided to the Township as MP4 files for posting on Township and SCPRA web pages. Question and answers, and comments posted during the webinar were also saved as document files. Copies of the presentation slide decks are in the appendices, and available here.

[Webinar 1](#) – December 10, 2020: Public Informational Meeting provided some basic project information about the Furnace Run Park site, funding sources, Township objectives and summarized findings of the Data Gathering phase of the project. A initial set of guiding principles and opportunities were also presented.

[Webinar 2](#) – February 18, 2021: Draft Master Development Plan Presentation presented a summary of the first webinar and summarized a refined set of guiding principles. The results and analysis of the recently completed public web-survey were presented. Preliminary recommendations, development phases, future

actions and other information that will be included in the Master Development Plan were also presented.

6.5.3. Stakeholder Interview Summaries.

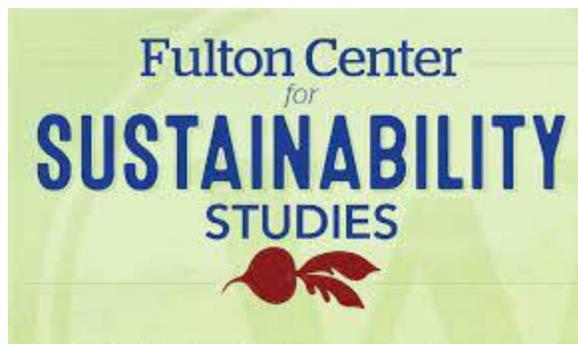
[Shippensburg Community Parks and Recreation Authority](#), Tyler Fairchild, Director. The project team interviewed Tyler Fairchild with regards to how the park might fit in with the activities and programs managed by SCPRA. Tyler indicated that they would assist as needed by the Township and that the Township should direct the creation of facilities and programs at Furnace Run. There are a number of programs needs that could be met at the park including youth summer day camping, and development of a bicycle pump park. Tyler felt that the park might generate revenue as a wedding venue, an outdoor movie event space, an amphitheater space, and other similar event rentals. The site appears capable of hosting large community and special events including Scottish games, bluegrass and other music events. The park topography would lend well to hosting ziplines or other adventure park facilities. Tyler felt the best use of Furnace Run Park was to provide an alternative to the available active recreation facilities in the area, where immersion in nature takes center stage.

[Shippensburg University](#) – The project team reached out to the faculty of the university as recommended by the project steering committee including Allen Dietrich-Ward and Claire Jantz. Claire provided a number of possible connections between the Shippensburg University and Furnace Run Park, including [the Center for Land Use and Sustainability](#) (CLUS) of which she is Executive Director. Claire was interested in getting involved in archeological survey work at the park, in particular researching the potential links to the early iron ore industry with the Applied History programs at SU. A part time graduate student might be available to lead the archeology project. Study of the municipal water supply and how it might be enhanced by Furnace Run Park might be an extension of the initial work completed by SU faculty member Thomas Feeney. Claire also recommended the Township contact Javeta Thompson about ‘Ship Serves’, SU’s student volunteer service project initiative. Ship Serves projects are undertaken in April and September. Another potential program connection to SU would be the Summer Learning Program (Adult Education) led by Alexandra Jones. Claire suggested special events such as 5k running events, seasonal festivals and other events would be suitable at Furnace Run. She felt that bicycle and pedestrian connections to the park were very important including connections to the Cumberland Valley Rail Trail and the Appalachian Trail. Allen



Dietrich-Ward (History Prof at SU) was also interviewed and felt the university could play a strong role in the park with a number of ways to leverage the talent of the faculty and students. Allen thought that the Geography and Earth Science department could get involved in detailed field investigations including work by some of the faculty vernal pool specialists. One unique potential link between the university and Furnace Run Park could be the opportunity to fill SU's need for a 'retreat center' away from the main campus. Among the important considerations Allen recommended strong coordination between the offerings at Dykeman Park and Furnace Run. He also felt Furnace Run might be a great site for establishment of a disc golf course.

[Wilson College](#), Chambersburg – In an interview with Christine Mayer, M.Ed., director of the [Fulton Center for Sustainability Studies](#) discussed opportunities to link Wilson College with Furnace Run Park. In particular, the Fulton Center's work in providing hands-on opportunities for students and community members could be linked to the opportunities for study and nature immersion at Furnace Run Park. Among the immediate areas of coordination would be to tap the knowledge base of Wilson College staff in establishing a composting program at the park. Faculty and students could participate in bio-surveys of the park site and develop a GIS database of information. The College is always seeking locations for conducting field



laboratories and locations for adult learners, including a week-long stewardship course. Christine thought the best revenue generating opportunities at Furnace Run would be rental of the park and facilities for meetings, wedding and conferences.

[Cumberland Valley Rail Trail](#) – Our team spoke with Allen Dietrich-Ward about connections to the Rail Trail one of the leaders in the development of the CVRT in the Shippensburg area and the leader in the creation of the [Conrail Museum](#) along the trail. Allen discussed the potential links to the park using active an abandoned local



A sculpture park along the Shippensburg University segment of the CVRT.

rail corridors. There was an abandoned short line that ran directly to Furnace Run, however, most of the corridor is now in private hands. Allen feels that there is great potential to extend the CVRT to Furnace Run because it create a link to other significant recreation areas including Veteran's Park, the Fairgrounds, and Dykeman Park.

Adjacent land owners (along Lindsay Lot Road & Nick/Terry Mannino);
Michaux State Forest managers;
Chambersburg Mountain Bike Club;
South Mountain Partnership;

7.0 GUIDING PRINCIPLES FOR FURNACE RUN PARK

7.1 Establishment of Furnace Run Park should be consistent with the recommendations, goals and objectives of the 2015 Southampton Township Comprehensive Plan

- Create a natural park with open space, passive enjoyment, trails and provide natural education;
- Recognize and prioritize development in the Park that reinforces the recreation needs of the community and the value of Southampton’s natural resources;
- Promote resource conservation within the design of Township future developments;
- Coordinate programming and facilities with other local and regional recreation offerings to assure Park development is integrated with existing nearby programs;
- Remain vigilant for opportunities to acquire available lands adjacent to or near the park lands;
- Develop partnerships with other organizations to provide mobility and connectivity between recreation sites, to share resources, and to maintain an open dialogue between partners;
- Respect private property around the park by maintaining and enhancing screening (whether vegetative, earthen, or man-made) and distance-appropriate buffers to established neighborhoods and individual residences.

7.2 With the construction of new housing units and a growing population, it is imperative to preserve open space and provide a variety of passive and active recreational opportunities for all age groups.

- Accommodate park activities by locating facilities in a way compatible to existing conditions to avoid significant clearing and earthwork;
- Work with state foresters to ensure activities are compatible with the existing site conditions and Michaux State Forest and South Mountain landscapes;
- Enhance trail connections to the forest preserves while maintaining a significant undisturbed buffer of forested greenspace;
- Leverage opportunities to provide four seasons of passive and active recreational opportunities;
- Enhance the completed mining reclamation with appropriate soil improvements, water resource protection, habitat enhancements and native plantings;
- Encourage preservation of existing natural buffers around the park to protect park site viewsheds;
- Provide recreational facilities consistent with the results of public recreation needs surveys and public input on Furnace Run Park;

7.3 Connecting routes to the park site and thus each corridor should be planned for the transportation modes of likely park visitors including pedestrians and bicyclists.

- Evaluate complete streets connections to the park along existing streets;
- Encourage new road construction with potential links to the park to include active transportation accommodations for bicycles and pedestrians;
- Explore potential off road connections to the park for bicycles and pedestrians including potential linkage to the Cumberland Valley Rail Trail;
- Expand public transportation routes to include the park;
- Implement new wayfinding and signage to help navigate users to Furnace Run Park by preferred routes;
- Plan secondary access roads into the park to incorporate bicycle and pedestrians.

7.4 Plan activities to attract youth to the park and allow youth to interact with the natural environment of the park.

- Play and trail opportunities that provide interaction with nature;
- Provide exciting and multi-level age appropriate playground and trail development;
- Provide for multiple kinds of nature education opportunities;
- Develop trails that provide progressive experiences;
- Consider temporary and seasonal overnight youth camping experiences;
- Accommodate summer youth recreation programs;
- Consider providing space for youth agricultural training opportunities such as FFA;
- Partner with local schools to establish spaces for participation in earth science activities;
- Plan for safe youth travel to the park.



7.5 Create facilities that are compatible with a nature park concept that incorporate the principles of universal access, respond to the needs of the aging population.

- Use on site or locally sourced natural construction materials that can be used for accessible routes;
- Provide smaller less-challenging loop trails that can be used by senior or the physically challenged;
- Create accessible trails to the greatest extent practicable;
- Create accessible wildlife viewing opportunities, fishing opportunities and play viewing opportunities;
- Provide activities and programs conveniently located near parking;
- Design facilities to accommodate local shuttle and school bus drop-offs and parking;
- Provide sheltered space for senior activities;



Universal access principles in design will allow for a more equitable experience of the park by all.

7.6 Leverage opportunities to quickly establish recreational uses of the park.

- Establish gateway features at the park entrance off of Lindsay Lot Road including an entry sign, wayfinding signage and a gate;
- Reuse and improve the well-developed system of access drives and provide names for roadways to help on site navigation;
- Adaptively reuse existing foundations, facilities, farm buildings where appropriate for structures, shelters and other park facilities;
- Maintain existing public water and electric service and locate new facilities for convenient connection;
- Preserve the diversity of landscape settings and take advantage of this diversity to keep the interest in the park;
- Establish viewing areas and small shelters where panoramic views are available;
- Establish initial uses where site topography, vegetative cover and soil conditions are favorable for establishment of access, parking and trails.

7.7 Incorporate sustainable design principles and conservation practices; consistent with local recreation needs.

- Construct park facilities using local collected natural materials to the greatest extent practical using local stone, timber and native plant species;
- Provide facilities with appropriate architectural styles that are compatible with surrounding architecture;
- Incorporate water quality Improvements and educate on their importance to the water supply, Furnace Run, Shirley Run, park wetlands, park ponds and other waterbodies;
- Recycle existing structures for potential adaptive reuse and cluster new facilities in areas with existing structures to reduce site disturbance;
- Enhance wildlife habitats by creating transit corridors in the design;
- Provide protections for critical species and provide education about these practices;
- Provide for local composting and compost management at the park creating resources that can be used to enhance soils at the park;
- Host a 'Bio-Blitz' and other similar events in coordination with local universities to collect data on species and habitats;
- Provide dedicated areas for 'test-plots' for the purposes of academic study of the park environment;
- Develop a plan for removal and prevention of invasive species, plant native species common to the South Mountain landscape;
- Keep large facilities and large scale development in the park flexible to adapt to future needs.

7.8 Foster local stewardship of the park

- Establish a *Friends of Furnace Run Park* to lead stewardship efforts;
- Continue public engagement with regular informational programs and outreach events;
- Engage local groups and invite them to develop, maintain and use park facilities;
- Engage park neighbors and enlist them in 'park neighborhood watch';
- Engage local university faculty and students to use the park for study and youth education;
- Engage local Future Farmers of America to establish agricultural education programs at the park;
- Engage local schools to use the park for environmental science study;
- Engage local sportsman's groups for habitat improvements and wildlife management;
- Engage local seniors groups for activities and volunteer stewards;

7.9 Coordinate park development with other regional and local park and recreation facilities

- Coordinate efforts with the Shippensburg Community Parks and Recreation Authority efforts to assess and manage local parks and recreation programs;
- Work closely with the South Mountain Partnership and Michaux State Forest to coordinate park facility and program development;
- Avoid duplication of specialized programs and services offered at other local sites;
- Share resources with other sites and programs to offer a greater diversity of programs at Furnace Run Park;
- Continue to partner with DCNR to develop facilities and programs compatible with DCNR regulations.

7.10 Actively seek public and private funding for continued development, improvement and maintenance of the park

- Prioritize park projects that can be accomplished leveraging private funds, volunteer construction, municipal labor forces and donated materials and services as a match for grant funds;
- Prioritize park projects that are highly fundable under available grant program priorities such as trail development, youth and senior focused recreation and public health focused recreation opportunities;
- Seek the help of local universities, school districts, neighboring communities, Franklin County, neighboring counties, State of Pennsylvania and Federal Government by reaching out frequently to elected representatives;
- Reach out to local developers for donation of materials and equipment to offset the cost of development and maintenance of the park;
- Reach out to the Mennonite community for assistance with future building construction;
- Reach out to local corporations to access company work parties for special park projects, spring clean-ups and event facilitation.

8.0 MASTER PLAN RECOMMENDATIONS

8.1. Purpose

In this next section we will discuss some recommendations for how to accommodate the public recreation needs in Furnace Run Park. The role of our team, is to apply our knowledge, expertise and experience in suggesting uses of existing places, recreation and program components that might be compatible with those spaces and design concepts for Furnace Run Park. This information can then be used to assess development costs, maintenance and security needs and long term improvements and expansions.

The recommendations below are a guide for the development of the park and as such should not dictate the future development. As the community changes, there will be shifts in needs that may force a reassessment of these recommendations. It is appropriate to assume that will be needed in 5 to 10 years.

8.2. Overall Master Development Plan – Mapping Overall and Detailed

The overall preliminary concept plans presented below were prepared using the available mapping provided by the mining company. The maps present the assessment of existing conditions, project committee input, the public recreation survey responses and public comments during webinar presentations. This plan does not present a complete build-out of the park but rather an achievable five-year plan for development. Below and overall concept and three of the key activity area development concepts are presented. The maps are also available separately in color at 24" x 36" size.

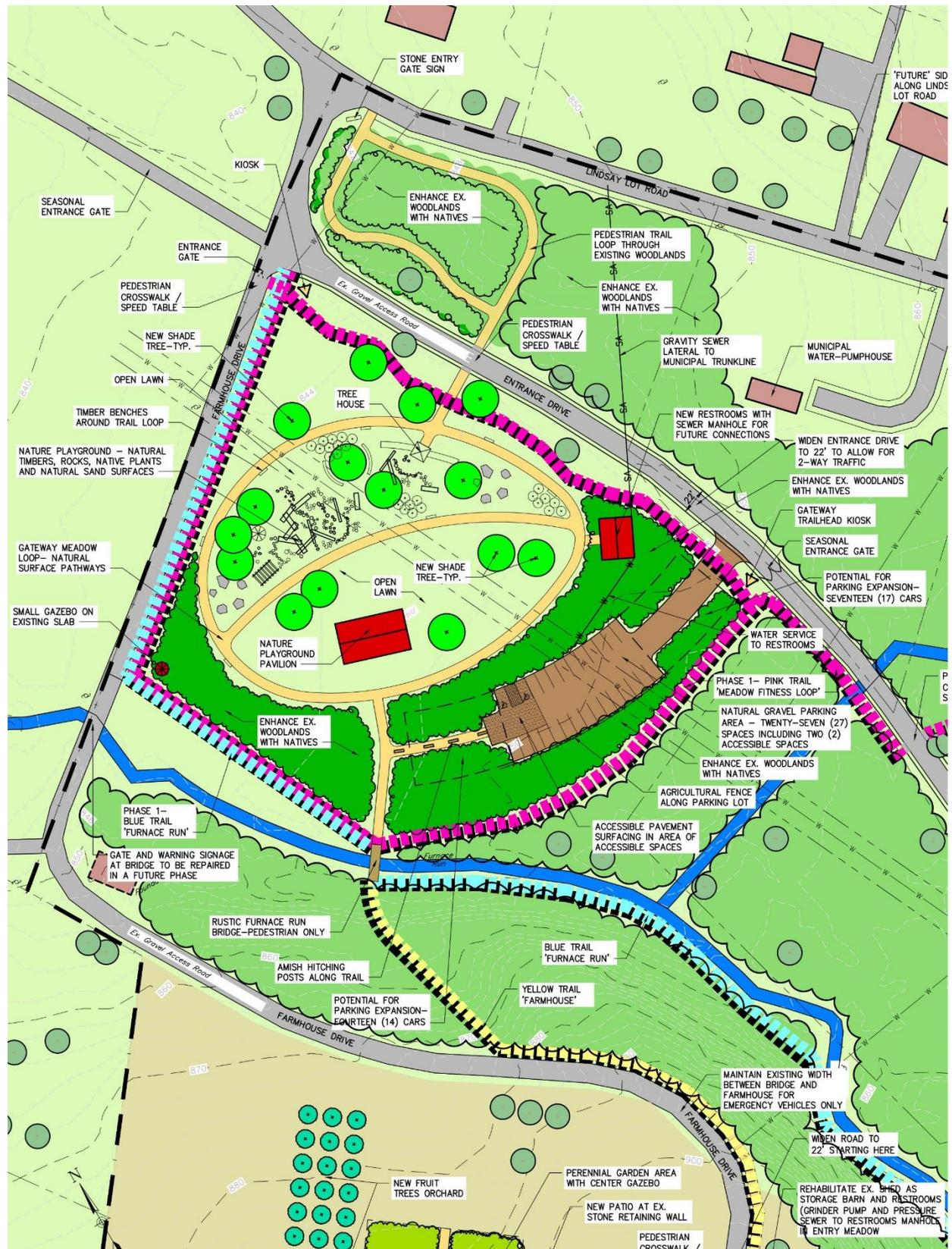


Figure 2: A detailed concept sketch of the Lindsay Lot Road Gateway Area at Furnace Run Park.

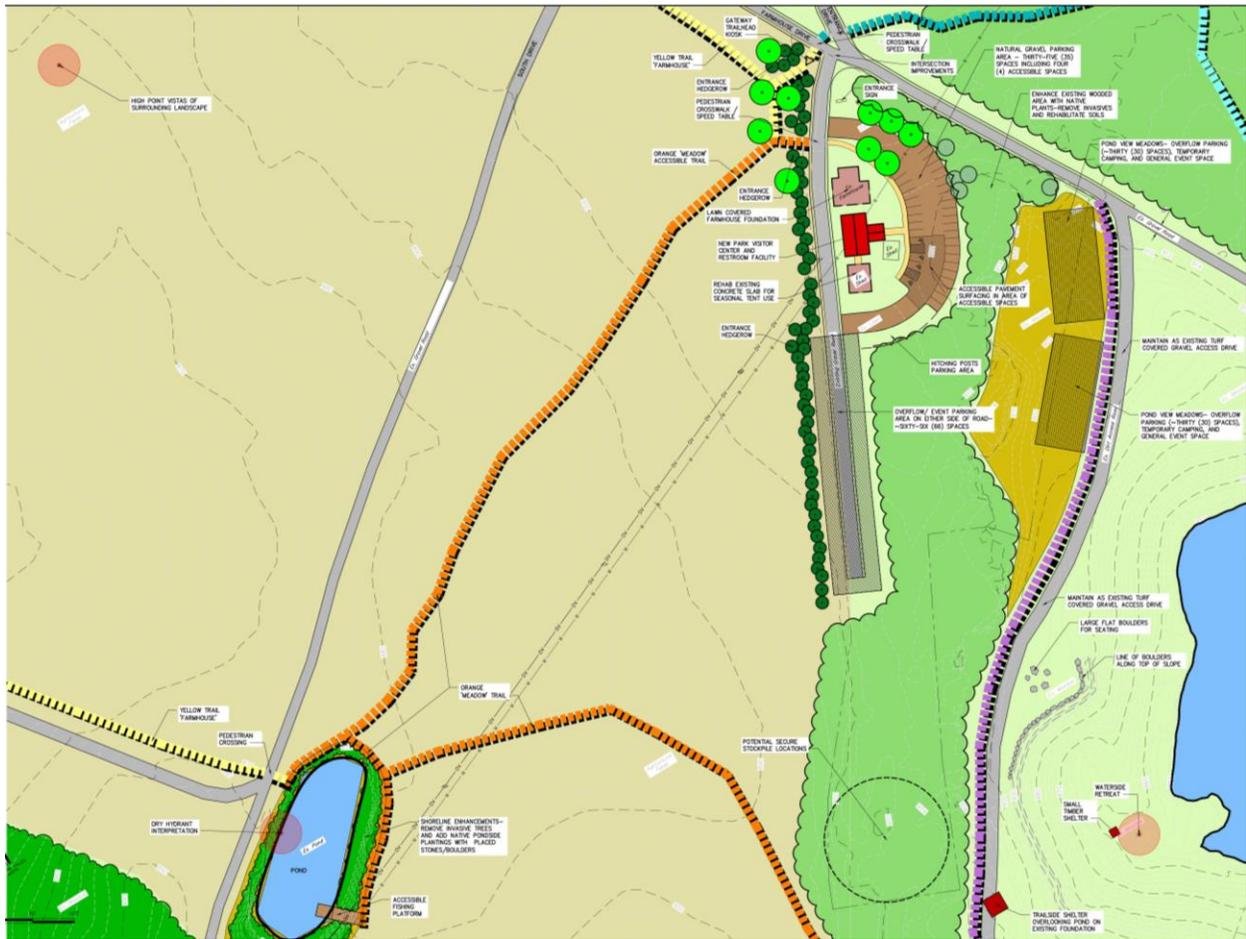


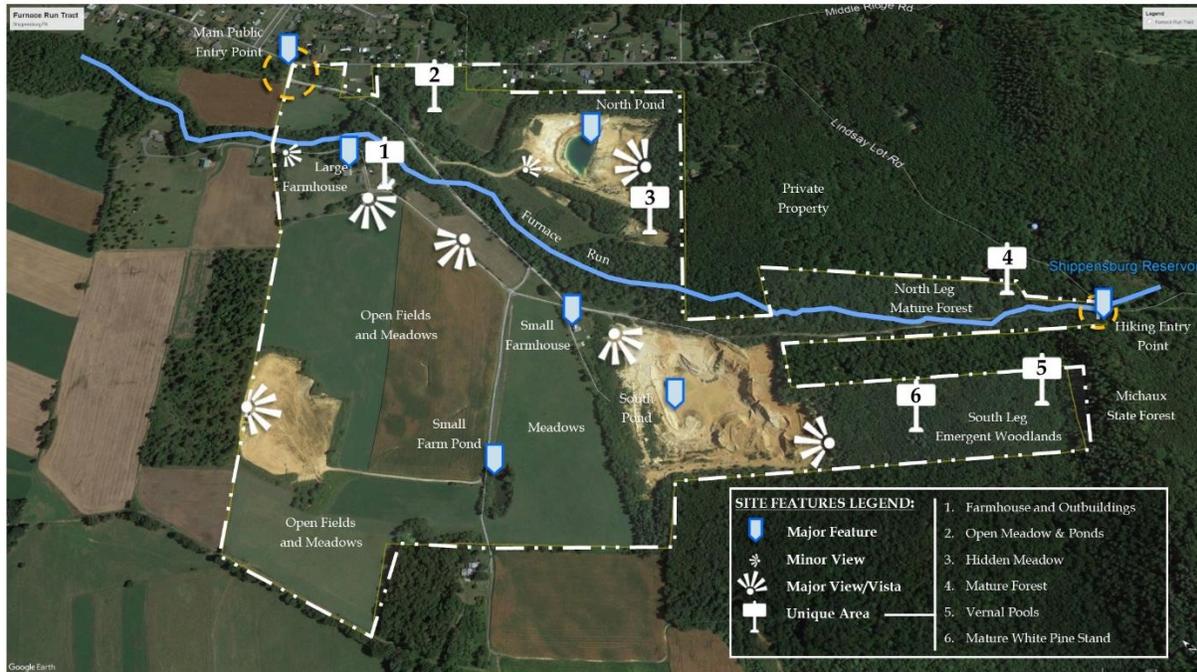
Figure 4: Concept Sketch of the Central Activity Area, site of the 'blue farmhouse'.

8.3. Activity Areas

The site is organized into several sub-areas that should be given unique distinguishably names. These names will help orient park visitors. For the purposes of this plan, they are referred to by generic names including:

- Lindsay Lot Road Gateway – The main entrance into the Furnace Run Park including a sheltered grassy meadow and the Furnace Run floodplain. The park’s front yard is approximately 7.5 acres of woodlands and meadows.
- Main Farmhouse – The site adjacent to the Gateway, the large 1,800 sq. ft., two and one-half story farmhouse anchors this 10 acres complex of farm buildings and lawns. 3,200 sq. ft. lean-to storage barn, a small 1,000 sq. ft. one-story (chicken coop?) building, a small 800 sq. ft. barn and a 180 sq. ft. storage shed adjacent to the farm house. A 16 ft. diameter corn crib is also part of the complex.
- Small Farmhouse – A 1.5 acre centrally located site of a former small farmhouse, has foundations and concrete pads that could be reused for park buildings. The site has water and electric service. Together with the surrounding 22 acres of meadows, woodlands and a pond, this site has potential as a great main point of contact for the park.
- Northern Meadows – This approximately 24 acre area encompasses the northeast corner of the site and is partially wooded open meadows some of which are established around the North Pond.
- Furnace Run Corridor – Furnace Run is a seasonal stream that bisects the park running east to west. The corridor is about one mile long and the easternmost portion of the stream as it passes through the northern leg of the park was observed flowing during the summer. The western portion of the stream as it exits the northern leg was dry throughout the summer months. The corridor is generally heavily wooded with gradually to steep banks.

- North and South Ponds – Two large ponds have formed in former pit mines that were excavated by the previous property owners. The ponds appear to vary in surface area and volume significantly seasonally. Recent drought conditions during summer months appear to have lowered water levels, exposing barren shoreline soils that were previously under water and thus not reclaimed and planted with ground cover. The approximately 1 acre north pond has a significantly more accessible and gradually sloping shoreline and is surrounded on three sides by gently sloping meadows. A steep grade 40 to 50-foot high separates the low eastern shoreline from woodlands along the northeastern park boundary line. The south pond has a significantly steep and deep shoreline feature around it, making it difficult to access. Natural dirt paths have been retained which can provide a circuitous access way to avoid steep slopes. A small wooded area exists in the south corner of the pond near the water elevation. The north facing slope down to the pond has a nearly 100' change in elevation, while the south facing slope has a nearly 40' change in elevation.
- North and South Legs – The easternmost portions of the park site are separated by a privately owned parcel of land forming to elongated 'legs'. Furnace Run traverses through the north leg which is typically a more gradually to gently sloping mature forested section of land. Near the east end of the north leg, the abandoned segment of Lindsay Lot Road still exists. The south leg is considerably steeper and covered with a more emergent generation of trees, with the exception of a plot of stately white pines in the center of the south leg. The east boundary of the south leg runs along the base of an extremely steep slope which rises to the top of Polk Hill.
- Agricultural Fields – The western 80 acres of the park site appear to be former agricultural fields, completely devoid of trees, with the exception of hedgerows that mark former and current property boundaries. The landscape of the field area is gently to moderately rolling and offers some prominent high points with great panoramic views of the surrounding landscape, South Mountain and Cumberland Valley.
- Dry Pit – At the southwest corner of the park is a third area of excavation. This appears to be a bank extraction that was not excavated as a pit. The remaining bowl-shaped landform creates a natural amphitheater setting framed by the 40' high steep slope along the western park boundary.



BARTON & LOGUIDICE D.P.C.-PENN TRAILS LLC

Furnace Run Park - Master Development Plan

EXISTING MAJOR SITE FEATURES

Figure 5: Map illustrating some of the key existing features at Furnace Run Park as well as identifying the activity areas discussed throughout this document.

8.4. Existing Water Features

There are several natural and man-made water bodies at Furnace Run. Local residents expressed a strong desire in the public survey to be able to quietly observe a water body, and the park if carefully planned will provide plenty of opportunities. That public desire also places value on the preservation of the existing resources and will guide other park improvements that relate to recreation and experience of these water resources. Our priority recommendations include study of water resources at the Park as well as some preservation actions. Recommendations include:

- Study causes of water loss (Furnace Run and Shirley Run);
- Study seasonal pond characteristics;
- Research enhancements to quarry and farm pond ecology;
- Evaluate water quality, need for green infrastructure in Park watershed;
- Study impacts of park waterbodies on public water supply;
- Make shoreline aesthetic, stabilization, habitat and resiliency improvements for all waterbodies;

- Manage invasive plant and animals, introduce native aquatic species and shoreline plantings;
- Evaluate ponds for permanent recreational use.

Furnace Run – In addition to learning about the loss of water along the length of Furnace Run through the park, a program of habitat improvements and shoreline stabilization should be undertaken along the wet and dry portions of the stream bed.

Shirley Run and Small Ponds – Shirley Run is an intermittent stream tributary to Furnace Run. Three small ponds form seasonally at that confluence, eventually drying and becoming saturated freshwater wetland areas during the late summer. Given the porosity of soils in the ponds, a future project could involve lining the ponds with less pervious soils and gradually re-watering them to become permanent pools. All three ponds could conceivably be connected by some earthwork which could create a pleasant shallow fishing and skating pond conveniently close to the Lindsay Lot Road Gateway Meadow recreation facilities.



Photograph in mid-July of one of the seasonal ponds formed at the end of Shirley Run near Furnace Run.

North Pond – The excavation that formed the North Pond is shallow and gently sloping and surrounded by flat to gently rolling terrain, creating an easily accessed shoreline and space for expansion and modification. The pond is the largest water body at Furnace Run Park. The pond side slopes and shoreline show evidence of erosion and land cover appears sparser than other reclaimed areas of the site.



Shoreline resiliency measures to reduce wave action erosion and improve pond ecology are needed.

Specific measures for the north pond include placement of a mix of natural rock, wattles, fiber logs, compost socks and appropriate pond edge

plantings. These will enhance the pond habitat, appearance, help improve water quality and prevent erosion and sedimentation. The North Pond can easily be expanded and the shoreline easily modified including the potential to create islands that could become habitat for birds and other creatures. The addition of irregular features along the shoreline would provide additional habitat for fish and birds.

The gentle slope and ample open space creates numerous opportunities for future use of the pond including recreational, educational

and as an aesthetic element. Initially the pond will be ringed by a trail loop, and the subject of contrived views from several prospect points on the park trail system.

Due to the ease of access, the North Pond is also easily adapted for environmental education and research. The ease of access will also make the pond an ideal fishing spot with the potential for floating accessible fishing platforms, pond side pavillions and picnic areas, wildlife viewing areas, and other water-based recreation. As the Township does not have a clear need for a specific facility

that would require a pond at this time, until there is a fit for something focused on the pond, it should be enhanced only as a passive recreation amenity, educational site and visual element.

Photograph of the North Pond facing east showing gentle rolling shoreline and surrounding meadows as well as the 80' bluff which marks the eastern site boundary.



Figure 6: North Pond is an ideal setting for a pond side pavilion and event space, floating platforms and picnic areas.

South Pond – The gravel mining operations that formed the south pond were more extensive and deep than anywhere on the site, thus reclamation work there was also extensive. The resulting deep valley has been referred to as a meteor crater and appears imposing and inaccessible when viewed from the surrounding rim. While the reclamation work around the pond has been fairly successful in terms of regrading and establishing ground cover, additional work will be needed to prevent slope erosion and shoreline erosion around the pond. Slopes, in spite of their appearance, are significantly less than a maximum angle of repose for stability of the site soils with the steepest areas 1 vertical foot for every 4 (25%) horizontal at minimum and generally at 1 vertical foot for every 6 to 10 horizontal foot (17% to 10%). Steeper slopes around the water level of the pond may have been caused by wave action erosion.



Photograph of the South Pond illustrating steep long slopes and evidence of slope and shoreline erosion

Specific measures for the north pond would be shoreline resiliency measures to reduce wave action erosion and improve pond ecology. Natural rock, wattles, fiber logs, compost socks and appropriate pond edge plantings will enhance the pond habitat, appearance, help improve water quality and prevent erosion and sedimentation. Some earthwork could be undertaken around the pond to add more irregular features to the shoreline could be done using soils donated by developers. The resulting juts and draws in the shoreline would provide additional habitat for fish and birds. Terracing along the slopes where appropriate will also help to reduce the potential for erosion along the long steep banks of the pond. Regrading to create short (8' maximum vertical) runs of 4:1 horizontal to vertical sideslope would reduce stormwater velocities coming down the slope, break up the long runs of the slopes and provide for footpaths and planting zones along the sideslopes.

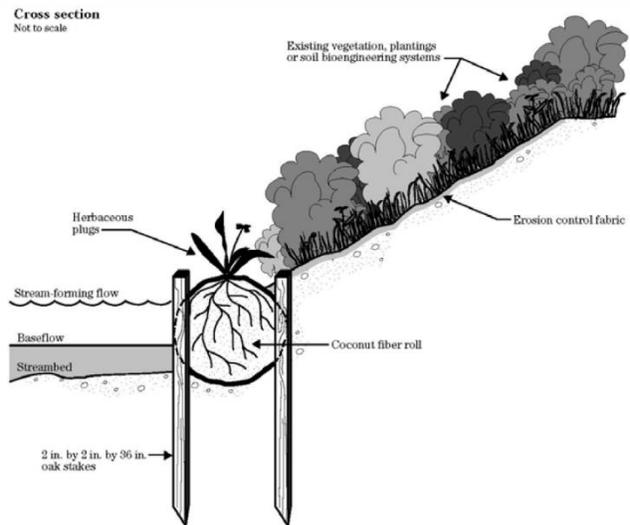


Figure 7: Example of a combination of techniques to stabilize a pond shoreline, filter runoff and improve pond habitat.

There has been discussion of partially or completely filling the south pond area with clean soil fill to reduce the severity of the steep sideslopes and make the 10 acres around the pond more usable and

accessible. This would be a significant undertaking, as using a simplified ‘average end method’ to calculate the needed volumes indicates that around 22,000 cubic yards would be needed just to fill in the pond. To partially fill in the entire pit to around the 870 elevation would require around 188,000 cubic yards of soil. At the low end of material cost (\$25/cubic yard) these volumes would represent \$550,000 and \$4.7M, respectively, worth of fill. Regardless, it may improve the pond as indicated in the discussion above to do some filling as suggested above to improve the pond habitat. In addition, the pond volume might be increased by lining the current bottom and portions of the sideslopes with denser clay soils. This could increase the volume and increasing the surface area to volume ratio, a indicator of pond ‘health’ and reduce the current fluctuations in water levels.

Farm Pond – South of the small farm house meadows, this 0.4 acre pond is situated among mostly open meadows and fields. The steeply sloped pond banks appear to be stabilized by the overgrowth of shrubs and emergent trees. Adjacent to one of the park drives a dry hydrant has been installed to enhance the fire protection in the area. The pond water appears fairly turbid but also appears to support a population of fish species.



A dry hydrant has been constructed at the farm pond site directly adjacent one of the existing park drives.

The dry hydrant is a significant safety feature for the park. It is centrally located in the meadows areas that might be susceptible to grass or brush fires during spring and fall dry spells. The pond offers easy access for fishing and could provide accessible fishing access with the addition of a raised platform cantilevered over the water. The pond will be a significant focal point along the anticipated accessible trail routes emanating from the small farmhouse area. Some resiliency and aesthetic improvements to the shoreline should be undertaken as well as placement of natural rock and planting with appropriate littoral plant species. Existing invasive species around the pond should be removed and replaced with more attractive native plants. A viewing area possibly including a small shelter could also be constructed convenient a trail near the pond.

8.5. Existing Buildings and Structures

Many of the remaining buildings at the park appear to be in a usable condition or repairable to make usable. We recommend that the existing buildings be evaluated and either updated for use or demolished. As a park site, many of the structures have significant value for use as facilities, if they can be economically renovated, repaired or rehabilitated.

Other structures remaining on the site include concrete bridges, foundations and pads. Bridges should be evaluated for soundness and may need to be retrofitted with guiderails and pedestrian railings. Remaining foundations and pads should be evaluated for the possibility of erecting new structures on the existing pads.

- Rehabilitate or Replace Existing Indoor/Covered Spaces for re-use
 - Large Farmhouse
 - Small Outbuildings
 - Large Lean-to Building
 - Small Farmhouse – Rebuild on existing slab/foundation
 - Concrete Pads
 - Steel corn crib
- Provide new outdoor stand-alone toilet facilities near farmhouse sites
- Provide exterior drinking water for park users
- Evaluate concrete structure and retrofit and upgrade bridges as needed for safety of park users
- Consider re-use of existing concrete pads and foundations for park buildings and shelters.

Large Farmhouse and Outbuildings - The large farmhouse was recently used by the mining company and appears to be in good condition. The building is prominently located from the gently curving approach driveway recalling romantic landscape garden design principles. The open west-facing 'front lawn' area slope gently away from the main house to the west benefitting from afternoon sun and offering pleasant sunset views from the 'front porch'. A stone retaining wall in good condition creates an additional opportunity to create an outdoor patio space adjacent to the porch. The west lawns might be improved with ornamental gardens and other landscape features, enhancing



The entrance drive approach and front lawn of the large farmhouse at Furnace Run Park.

the potential demand for rentals of the building and site for private events. Modifications made throughout the building make it unlikely to be historic, which provides greater flexibility in terms of its adaptive reuse and further renovation by the township.



The front lawn of the Main Farmhouse faces west and a stone retaining wall as well as the front porch creates unique separate spaces.



Significant modifications to the façade, interior and masonry have probably eliminated any potential for a historic designation.

The rear of the farmhouse has numerous usable small buildings and a large concrete slab from a structure lost to a fire. The rear yard has a less formal utilitarian appearance as a result, but with some landscape improvements could provide some attractive and useful outdoor spaces for functions hosted at the main farmhouse.



The farmhouse backyard provides a wide gently sloping space that could support events at the farmhouse.



The small 'chicken coop' building near the farmhouse backyard could be reused as an accessory shelter.

Four small buildings appear in excellent condition or easily made usable without great expense. A small single bay garage building (10' x 18') is adjacent to the farmhouse and would be useful for storage. A chicken coop building with a low roof exists near the farm house. The 44' x 118' timber frame with extensive window openings is situated on a concrete pad. The basic structure could be salvaged, possibly raising the roof 3-5 feet in elevation and creating a 1,000 square foot partially enclosed shelter or pavilion by open up large areas of the long facades. A small 800 square foot barn is situated north

and east of the farmhouse. The central sliding barn door appears to be functioning and structure seems sound. This 1-1/2 story structure has great potential for a multitude of uses including offices, storage, retail space, small events, and classroom space. Adjacent to the shed is a 30' x 30' concrete pad that could be used as a patio space or covered with a tent during events. A steel framed corn crib is located near the farm house with open views to the south. These types of structures are commonly converted into gazebos and pending an evaluation of the structural metal, this would be an interesting reuse of this structure.



The small barn and the adjacent 900 square foot concrete slab.



A steel framed corn crib, located prominently with panoramic views.

The largest outbuilding on this site is a 1,800 square foot lean-to storage building currently housing farming equipment. This building appears to be in fair to poor condition and if a large open storage facility is useful in support of the eventual use of the farm house, may be worth shoring, continuing use for open storage. If the building is considered too unstable, there may be structural timbers that can be salvaged and used elsewhere in the park as the framework for other structures.



The large lean-to storage building and hay loft may be useful continuing as a storage facility removing less stable additions.



An internal view of the lean-to storage building shows stockpiles of salvaged timbers as well as usable structural timbers.

Small Farm House Site – The small farm house was the last structure left on this site before it was demolished for safety reasons. The foundation and basement slab were retained for potential reuse for a future new structure. Near the house a 400 square foot concrete slab could be reused for a small timber shelter. Other concrete slabs from facilities used during operation of the mining operations exist near the site and these should be evaluated for reuse as possible sites for tents or smaller shelters.

Other Structures – Park roads cross Furnace Run in two locations, one crossing along the approach drive to the Large Farmhouse and the other on the main park access road approaching the small farmhouse area. The single lane concrete structure along the large farmhouse driveway crossing Furnace Run appears to need several safety related upgrades to be usable as an entrance drive including guiderails and signage. The bridge is a significant constraint in terms of access to the site by way of the drive to the main farmhouse site, thus initial public access to the farmhouse should be by way of the main park



The 12' wide concrete deck of a single lane bridge crossing for the approach drive to the large farmhouse.



Photographic illustrating the need for safety upgrades to the bridge crossing Furnace Run on the large farmhouse driveway.

road then doubling back to the site from the south. The bridge on the main park access road appears to be a concrete culvert as well, however it is a two lane crossing and appears to be sized for haul road traffic including fully loaded dump trucks. Both bridges should be inspected for stability and concrete condition.

New Structures – The township would like to establish restroom facilities as soon as possible at the site and rather than study the capacity and potential to expand the existing onsite septic facilities is considering stand-alone composting or vaulted toilet facilities for the park. While these would be dry facilities, access to potable water can be added with drinking fountains and hose bibs on the exterior of these facilities. Prefabricated concrete facilities are commonly in use at the National Parks and other recreation areas across the United States in either composting or vaulted styles. Vaulted facilities need to be pumped out occasionally, while composting facilities are generally emptied once or twice per season. Another option to consider as a temporary solution is to construct rustic enclosures for portable toilets (port-a-johns).



Precast concrete toilet facilities include holding tanks and interior fixtures can quickly be installed and put into service. (Easiset)



Prefabricated facilities can be manufactured utilize rustic textures and finished colors to help blend into the park landscape. (Easiset)

Small timber pavilions and park shelters are very economical, especially where they might be erected on existing concrete slabs. Several local manufacturers are conveniently near Southampton including Penn Dutch Structures in Shrewsbury, and Shawnee Structures in Bedford.



Timber shelter (12' x 16') by Shawnee Structures.



14' Octagon Gazebo from Penn Dutch Structures

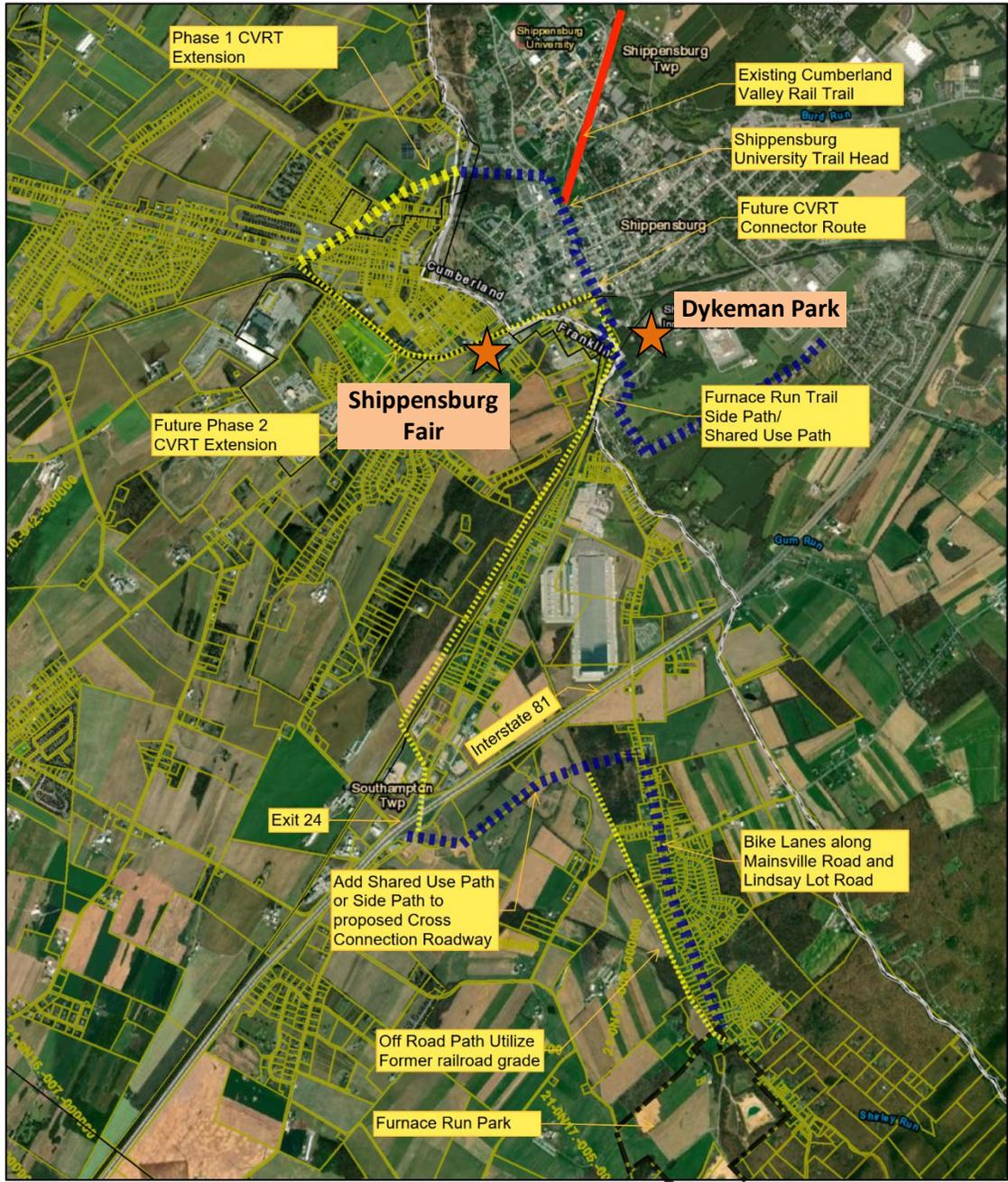
8.6. External and Internal Park Access

Park access improvements are needed on three levels, getting to the park, getting around the park and getting around activity areas and parking in the park. Based on the public survey a 97% share of park visitors in the area arrive by car. This is likely because there are no alternative connections that are considered convenient or safe. Survey respondents also walked and bicycled to local parks where convenient, which may partly represent use of the Cumberland Valley Rail Trail. Further study is needed to investigate opportunities to further shift that travel mode away from cars.

Getting to the Park - Lindsay Lot Road appears to be in good condition and adequate lane widths for vehicles and buses, however, it does not include pedestrian or bicycle amenities. It is not clear whether adequate space exists to provide sidewalks or bike lanes within the road right-of-way. A priority should be placed on evaluating use of the road versus finding an off-road connecting route. A feasibility study might include evaluating:

- Addition of bike lanes or other accommodations along Mainsville Road and Lindsay Lot Road;
- Development of Alternative Off Road Bike Ped Routes working with Cumberland Valley Rail Trail;
- New Access Road (referenced in the Southampton Comprehensive Plan 2015) additionally designed to incorporate a pedestrian trail/shared use path;
- Development of the former railroad grade that parallels Mainsville Road and Lindsay Lot Road as a shared use path/rail trail;
- Pedestrian and bicycle accommodations along a secondary access road connection from the park to White Church Road;
- Other access routes through Southampton Cumberland County;
- A Greenway Trail along Furnace Run.

The figure below illustrates some of the above routes in the context of the existing and planned extensions of the Cumberland Valley Rail Trail as well as abandoned rail lines and public road right-of-ways.



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- Recreation / Parks
- Rail Lines
- Municipal Boundary
- County Boundary
- Tax Records**
- Tax Parcel

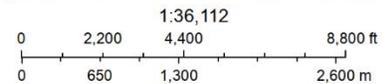


Figure 8: Potential Bicycle and Pedestrian Connecting Routes to Furnace Run Park

Getting Around the Park – The existing Internal road hierarchy is well organized to provide internal access to the key sites. The Main Road leads into the site and directly to the small farmhouse area. Secondary roads provide access to the large farmhouse and other areas of the park. Several existing gravel road grades exist, either overgrown or partially overgrown. These roads should be mapped for emergency and potential future upgrade. No pedestrian systems currently exist but the anticipated trails network will serve well and separate distinct system for pedestrians. Bicycles will likely share use of the park roads. At each key areas, parking access and pathway connections will be needed.

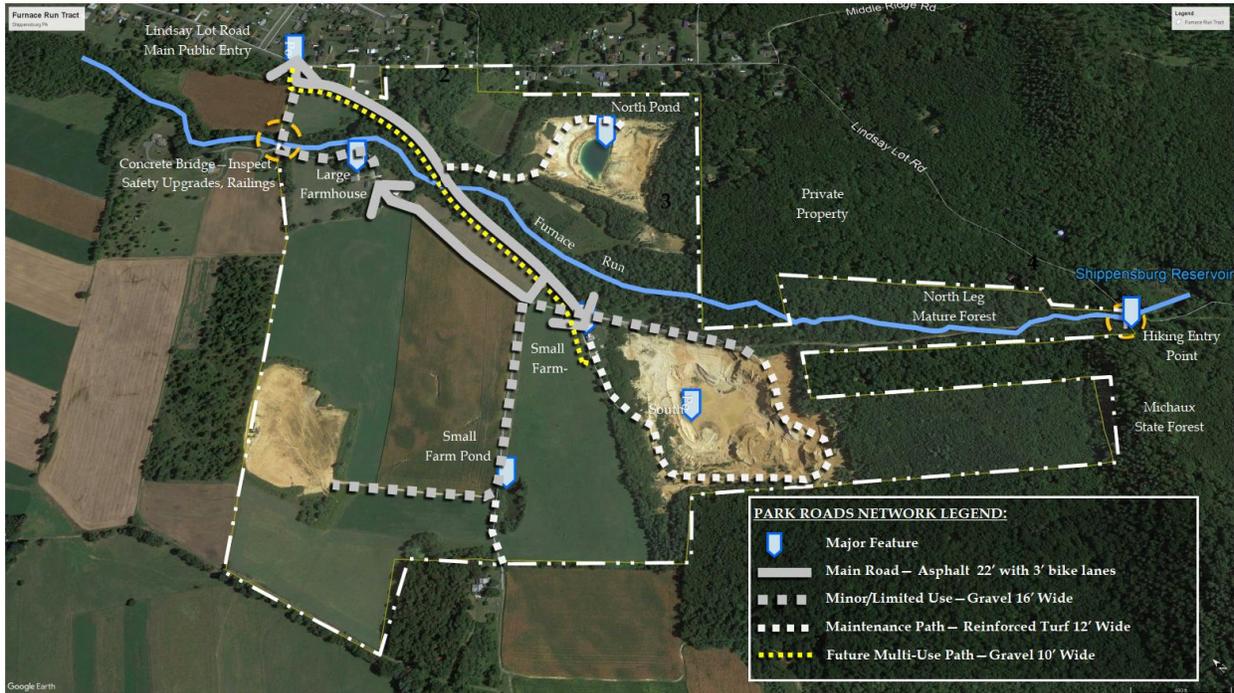
- Map shared roads, walking paths, trails throughout the park site
- Study the feasibility of a secondary/emergency access road from the southwest corner of the park connecting to White Church Road
- Site Access and Parking at the Lindsay Lot Road Gateway Area, Large Farmhouse Area and Small Farmhouse Area
- Through circulation at sites/activity areas
- School bus parking, turnarounds and drop-off areas at the farmhouse sites
- Handicap parking and access at all sites
- Parking lots and areas for expansion in screened or easily screened areas

The suggested road network at Furnace Run Park can easily be accomplished without extensive cost. Utilizing the existing main haul road as the well – developed main park drive will provide a highly resilient roadway for the expected traffic in the park including maintenance vehicles, buses and emergency vehicles. A three tier hierarchy is suggested including a paved 22' wide Main Road which would serve both Farm House sites, 16' gravel drives providing public connections to other areas, and turf surfaced maintenance paths intended to provide access for maintenance, repair and emergency equipment to other areas of the park. A future parallel multi-use path for bicycles and pedestrians is suggested along the Main Road between the main entrance and Small Farm House Area. The plan also suggests an inspection of the concrete bridge on the access drive to the Large Farmhouse as part of the Minor/Limited Use road. Safety upgrades for the bridge would include inspecting for scour damage and repair of any damage, installation of warning signage, guiderails, and grading improvements at the approaches. The culverted crossing of the Main Road over Furnace Run should also be inspected to inspect for scour damage and undermining and to confirm the structure's conditions.



The 'Main Entrance Road' is well established through the park and curves to the left in this photo. The secondary path continues straight (lighter colored gravel) to a concrete bridge crossing.

The map below illustrates the suggested road network for the initial phases of development for Furnace Run Park.



BARTON & LOGUIDICE D.P.C.-PENN TRAILS LLC

Furnace Run Park - Master Development Plan

SUGGESTED ROAD NETWORK

Figure 9: Suggested Road Network illustrating formalization of roads and access ways at several levels.

Project Area Access – Within the site circulation for each activity area, special accommodations should be incorporated into site design including accessible routes, curbside drop-offs, bus circulation and parking, automobile parking including handicap spaces, pedestrian handrails, bicycle guiderails, etc...

Furnace Run Park Site Design Parameters				
Site Element	Standard	Min. Dimension	Max. Dimension	Notes
Turning Radius (Car/Bus)	Radius	Car 25' Bus 75'		
Main Access Road	Width	22'	24'	
Typical Parking Lot Access Drive	Width	24'	-	
Auto Parking Stall	Size	9' x 18'	10' x 20'	
Bus Parking Stall	Parallel Stall Size	10' x 60'	-	
Sidewalks	Width/Grade	5' wide/1.5%	8' wide/4.9%	
Ramps	Width, Length, Grade	4' wide, 30' long, 5.0% grade	8' wide, 30' long, 8.3% grade	
Hand Rail/Railings	Height	36"		

8.7. Utilities, Municipal Services

The site is well served by utilities but additional study is needed. One of the priority needs will be to evaluate the onsite septic treatment that serve the farmhouses. In addition, study will be needed of the soils for suitability as treatment medium. Specific related recommendations include:

Electric:

- Evaluate existing the current service capacity for key areas (Gateway Park, Farmhouse Area, Small Farmhouse Area) including new site lighting, future event service needs;
- Relocate electric service to underground conduit through the park, remove overhead lines and utility poles;
- Extend service to pavilions, restrooms, trailheads and other new facility sites;

Water Service:

- Evaluate service laterals to farmhouses and upgrade as warranted by code;
- Extend services to shelters, pavilions, playground drinking fountains and restroom drinking fountains, other new facilities;

Sanitary Service:

- Evaluate septic needs, feasible locations for new leach fields farmhouses;
- Investigate potential pressure sewer connections to municipal sewers;
- Add future laterals to serve restrooms;

Telecom:

- Extend cable, telephone and other wired services into the park.

One of the most important initial facility improvements will be to provide restroom facilities. While the existing farmhouse has restrooms, it may take time to study their suitability for public use.

To serve the immediate needs for restrooms standalone facilities that can be quickly incorporated included vaulted toilets or portable toilet enclosures around porta-potties are recommended. Sewer extensions can be provided to vaulted or other standard wet toilet facilities for future connection to a municipal trunk sewer in future phases. Handicap accessible facilities available in portable and prefabricated systems should be provided in easily accessible areas.



Figure 10: Simple three-sided Porta-Potty enclosure using 8' stockade fence sections.

8.8. Trails, Trail Linkages and Pathways

Sustainable trails don't just happen. A trail that captures a sense of place and experience, while minimizing the ecological impact on the landscape, can only occur through thoughtful planning, good design, accurate layout and installation.

A sustainable trail, rehabilitated or newly planned correctly from the beginning, will require minimal maintenance over extended periods of time. In addition, it will meet the recreational needs of the present generation without compromising the ability of future generations to meet their own recreational needs. This is at the core of understanding, implementing and maintaining sustainability within the trail system.

A. Physical Sustainability - Designing trails to retain their structure and form over years of use and under forces of humans and nature is a key factor in sustainability. The more a trail is utilized by people, the more it is susceptible to wear and tear. Thus, a trail must be designed with anticipated usage in mind, to ensure that it remains physically stable with appropriate maintenance and management.

B. Ecological Sustainability - Minimizing the ecological impacts of trails and protecting sensitive natural and cultural resources is fundamental in sustainable trail design and development. The increased frequency of significant weather events, invasive species, and White Oak dieback on South Mountain are significant factors that should be considered by the township when planning ongoing management and regular maintenance of trails.

C. Economic Sustainability - For any trail, the implementing agency or advocacy group must have the capacity to economically support it over its life cycle. Developing and committing to a long-term maintenance strategy is a critical aspect of a successful trail program.

D. User Sustainability – Trail-user sustainability refers to the understanding that a trail user has regarding their impact on the land, their influence on other users' enjoyment of the trails, and their ability to co-exist with different types of trail users and groups.

Trail Planning and Management Fundamentals - The fundamental components of contemporary, sustainable trail planning and management are referred to as Trail Management Objectives. Referred to as "TMOs", Trail Management Objectives should be established for every trail or shared-use path at Furnace Run Park. This Master Plan establishes trail management objectives (TMOs) as the trail standards and practices, against which each trail's management, rehabilitation or new construction, maintenance, budget, materials and manpower can be measured and performed. The TMOs, with their inherit Design Parameters, provide Southampton staff and volunteers with the key tools they need to confidently manage and maintain a trail without having to second-guess design and maintenance

choices. These TMOs help ensure a management framework of continuity and consistency over time and through personnel changes.

Together, these Best Management Practices help planners and managers objectively site and maintain trails in the appropriate areas with the most sustainable use and design parameters determined, thereby delivering better performance and sustainability, more trail user satisfaction, and less maintenance over the long term.



Having TMOs will result in this asset



Having No TMOs may lead to This Problem

The TMOs for Southampton Township's Furnace Run trails should consider; Stakeholders' uses, needs and desires for the Furnace Run Trail System.

- Nearby bathrooms, picnic tables, food and trash cans;
- Information about the trail allowing users to be oriented to the route;
- Well marked with adequate signage for wayfinding;
- Provide seating and resting places with interesting views or views of water features;
- Trail wide enough to walk in small family groups.

Identify shared goals and objectives for the Furnace Run Trail System.

- Accessible facilities where practical;
- Hiking trails that provide a variety of experiences including opportunities for immersion in nature, wildlife viewing, viewing of water features and vistas of the landscape;
- A connection through the park that will provide a link to Appalachian Trail;
- A trail system that provides connections throughout the park while keeping a respectful distance from neighboring residential properties.

The five TMOs consist of the following:

- A. Trail Type - A fundamental trail category that indicates the predominant trail surface or trail foundation, and the general mode of travel the trail accommodates. The Trail Type differentiates between the three basic kinds of trails: Standard/Terra, Snow, or Water.

- B. Trail Class - The prescribed scale of trail development, representing the intended design and management standards of the trail. These are based upon the recognized Federal Trail Data Standards and National Trail Management Classes, both of which are in this Appendix to this report. Assign the most appropriate Trail Class for the trail or trail segment. If more than one Trail Class is assigned to the trail, identify each Trail Class by individual trail segment. Trail Classes for Southampton Furnace Run Park are either Class 3, 4 or 5.
- C. Managed Use – This TMO is determined by the modes of travel that are actively managed and appropriate, considering the design and management of the trail. Managed Use indicates a Southampton municipal park management decision or intent to accommodate and/or encourage a specified type of trail use. Accommodating the Managed Use frequently determines use-specific trail maintenance and signage costs. There may be more than one Managed Use per trail or trail segment. Managed Use decisions should be documented, indicating the dates during which that use is actively managed.
- D. Designed Use - The intended use that controls the desired geometric design of the trail, and determines the subsequent maintenance parameters for the trail. The Designed Use must be identified for each trail or trail segment. The Designed Use identifies the single use or limiting factor that drives technical Design Parameters for the trail (i.e. tread width, grade, turning radius, etc.). The Designed Use is necessary to establish the trail’s geometric design standards from which the trail is designed, constructed, managed and maintained. While several Managed Uses may occur on the trail, there is only one Designed Use for any given trail or trail segment. For the purpose of the Furnace Run Park trails, Designed Use is for Pedestrian/Hiking.
- E. Design Parameters - The technical specifications for trail construction and maintenance, based on the Designed Use and Trail Class. Design Parameters identify the technical specifications that drive the trail design, construction, maintenance, and subsequent reconstruction. For each combination of Designed Use and Trail Class, there should be a corresponding set of established Design Parameters. As a baseline, Penn Trails uses the established Federal Trail Data Standards, utilized by federal land management agencies, as the basis for determining specific Design Parameters for a trail or trail segment. In addition, trail designs must include additional field verified and sited criteria that are very site-specific and require sound trail design and engineering judgment to define for each trail. Each Design Parameter for a specific trail should be identified as a specific value appropriate for that trail.

Trail Design Parameters - The following Trail Design Parameters convey the dominant criteria that we recommend define the geometric shape of a particular Trail. These design parameters do not apply to Shared Use Pathways. The following Design Parameters are key components of the overall TMOs, providing intentional structural guidance as to what the design and construction of a new, rehabilitated

or altered trail ought to be. These help to assure the physical, environmental and economic sustainability of the trail system.

Furnace Run Park - Trail Design Parameters				
Designed Use HIKER/PEDESTRIAN		Trail Class 3 "cow paths" to stream	Trail Class 4 North Pond Trail	Trail Class 5 Blue Trunk Trail
Design Tread Width	Singe Lane	36"	48"	60"
	Double Lane	48"	60"	72"
	Structures (Minimum Width)	36"	48"	60"
Design Surface ³	Type	<ul style="list-style-type: none"> Native with some onsite borrow where needed for stabilization, occasional grading Intermittently rough 	<ul style="list-style-type: none"> Native with improved sections of borrow or appropriate aggregate material, routine grading Minor roughness 	<ul style="list-style-type: none"> Likely appropriate aggregate material, routine grading Uniform, firm, and stable
	Protrusions	≤ 4" May be common, not continuous	≤ 2" Uncommon, not continuous	No protrusions
	Obstacles (Maximum Height)	8"	6"	No obstacles
Design Grade ³	Target Grade	3% – 12%	3% – 8%	1% – 5%
	Short Pitch Maximum	15%	10%	8% Accessible Trail BMPs = <5% – 8.33%
	Maximum Pitch Density	10% of the trail	10% of the trail	0% – 5% of the trail
Design Cross Slope	Target Cross Slope	5% – 7%	3% – 5%	2% – 3% (or crowned)
	Maximum Cross Slope	7%	5%	3%
Design Clearing	Height	8'	8'	10'
	Width	36" – 60"	48" – 72"	96"
	Shoulder Clearance	12"	12"	12"
Design Turn	Radius	4' – 8'	4' – 8'	6' – 12'

In accessing the site for development of trails, our team determined that long perimeter loop trails were impractical, especially in the narrow North and South Legs that abut the Michaux State Forest. Since the park also abuts private properties including residences, it is important to maintain an appropriate buffer between trails and property lines making such loops impractical.

The greatest opportunity for the establishment of a trail is to take advantage of the water easement that bisects the park from west to east through the North Leg. The north leg also provides the best opportunity to connect to trails in Michaux State forest and eventually link to the Appalachian Trail. This main 'Blue Trunk Trail' would be an important part of a system of links that could link the community to the Appalachian Trail, as well as a link for trail users to the community.



Figure 11: Survey participants strongly supported trail development that could accommodate family groups.

In addition there are numerous smaller scale and specialized trails that can be established on the site over the next few years.

Blue Trunk Trail (Class 5)

- Establish a trunk trail over the water easement with trail surface, boardwalks, signage making a connection from Lindsay Lot Road through the North Leg;
- Establish trailhead facilities at trunk trail park entrances and at main activity areas with orientation, mapping and rules of use information;

Other Trails (Class 4)

- Connecting trails to the North Pond/Meadows, South Leg, farmhouse sites;
- Establish an accessible nature/sensory loop trail between the farm pond and the small farmhouse, with trail surface, interpretive signage as required;

Cow Paths to Stream (Class 3)

- Connecting paths from the trail to sites along Furnace Run, ponds, vistas, historic sites, wildlife viewing areas that are not directly on one of the trails.

8.9. Trailheads, Trail Amenities and Wayfinding

Trailheads - Trailheads are important nodes and design elements of a trail system. They provide the first and last impression of the trail system in terms of quality and experience. A cohesive image is important for the recognition of the trails identity. The trailhead user's experience is equally important to promote the use of a trail.

The following guidance is provided to assist in achieving a set of goals and objectives for trailhead design parameters. Trailhead design parameters should also compliment the associated TMOs and design parameters for the specific trail they are intended to serve.

"A trailhead is defined as an outdoor space that is designated by an entity responsible for administering or maintaining a trail to serve as an access point to the trail." (United States Access Board F106.5 (Recreation Facilities)).

By definition, the intersection of a trail with a road or each other is not considered a trailhead, unless it is designated and designed as such.

A. Trailhead Design Goals - The main design goals of a trailhead to achieve for this guidelines are:

- a. provide trail users a pleasant, convenient, unique and memorable experience.
- b. enhance the identity and sense of place at the beginning of a trail.
- c. ensure safe and easy connection to the trail and other transportation modes.
- d. provide a place with universal accessibility.
- e. develop a place that will be context-sensitive, physically, ecologically and culturally.
- f. create a place that will meet the needs of a diverse range of users in terms of age, gender, race, and physical ability.
- g. construct a sustainable trailhead.

B. Trailhead Function - Typically trailheads serve, but are not limited to, the following functions for the trail user:

- a. Signals the beginning or end of a trail.
- b. Serves as a meeting place for the user prior to exploring the trail.
- c. Provides a place for rest and relaxing.
- d. Supplies information about the trail.
- e. Guides the user's experience.
- f. Provides a sense of the quality and ideals of the managing agency.

The public survey indicated strong support for a variety of trails at Furnace Run and most important factors in the enjoyment of the trails was the amount of information about the trail allowing users to be oriented to the route, resting places with interesting views, and adequate space to walk in small family

groups. Trailheads will be an important first contact opportunity to provide information about the trail system, levels of difficulty of a route, length of trail and accommodations along the route. Two types of trailhead are appropriate:

Gateway – These would typically be located at the key contact points in the park such as near Lindsay Lot Road, at the trail entrance from Michaux State Forest in the North Leg of the park and at major site parking facilities such as the central area at the Small Farmhouse site. A large kiosk with a park map indicating the park trails network and offering basic information about the trails, presenting rules of use, and offering interpretive information. It may be desirable to locate a restroom and drinking fountain near each gateway trailhead and to provide site lighting. Bike racks and benches should also be considered.



Figure 12: Example of facilities that might be included in a Gateway Trailhead. (Photo by Easiset Corp.)

Minor Trailhead – A minor trailhead would be established where trails intersect or at the start of smaller loop trail system. This would include the meadow trail route at the small farmhouse site and the interpretive loop in the south leg. A small map of the route and connections, or finger style directional signage with the trail segment length in miles, typical time to complete and relative challenge presented.

Signage - A contemporary signage and wayfinding system should be planned, designed and implemented in order to clearly identify Furnace Run Trails, contained within the park versus Michaux State Forest Trails, private or public boundary blazes. These important elements will provide for an enjoyable, safe and welcoming experience for all trail users that is convenient, encouraging, and educational. A contemporary signage and wayfinding system should therefore;

- Insure the sign system for trails is simple, communicative, with clear and legible information and appropriate information load.
- Develop a sign system that recommends sign materials that are durable, vandal, graffiti and weather resistant, easy to repair and replace, and economical.
- Develop a design theme and recommendations for proper placement to establish an identity for each trail and unifies that identify within the structure of the Furnace Run Park and the trail system.
- Develop a sign system that ensures consistent material, design theme and placement to establish an identity for the trail/ within the structure of the wider municipality signage system and provide a cohesive feel for each trail within the larger system and the community.

- Provide visual character in the vicinity.
- Provide a theme that maintains the feel of its trail.
- Provide marker locations along the trail. But do not over blaze or create “sign pollution.”

Signage & Wayfinding Categories - The Furnace Run Park trail system should incorporate six categories of signs;

1. Identification Signs,
2. Informational Signs,
3. Regulatory Signs,
4. Warning Signs,
5. Wayfinding Signs
6. Markers/Blazes.

Each of the above category has its own unique functions. Each category of sign can be placed as an individual sign, or with information of other categories of sign to provide multiple functions on one sign and to prevent visual clutter.

8.10. Playgrounds, Play Areas

The Project Committee views the creation of a gateway park at the Lindsay Lot Road entrance a priority. This will establish the site as a public recreational amenity, provide an attractive gateway for the park, serve a recreational need for the immediate neighborhood and can be accomplished in the short term with a meager investment. We recommend that a Nature Park theme be incorporated into the facilities, establishing play facilities with rustic timbers, stone and other locally available materials. Other play areas may be significantly more intensive as there is ample space for development of other kinds of play areas that would be compatible with the neighboring Michaux State Forest.

- Neighborhood Playground
 - Establish a meadow natural play area near Lindsay Lot Road entrance
 - Provide parking, bike racks and benches and play structures
 - Establish a perimeter trail around the meadows
 - Provide an outdoor drinking fountain
- Adventure Play Areas
 - Establish locations for adventure play areas such as rope course, aerial structures, zip-lines and pump biking circuit
 - Consider views from South Mountain in structure locations
 - Establish winter play areas with parking, restroom facilities and warming huts
- Other Recreation
 - Geocaching, disc golfing, dog runs;

These photographs illustrate the use of collected natural materials to create play structures such as the facility anticipated at the Lindsay Lot Road Entrance. Developing the playground can become a community event, supported by volunteers and donated equipment from local educational institutions and companies.



Figure 13: Examples of nature play facilities built using natural stone and timber collected on-site.



Construction of Children’s Play Facilities – The key objectives reflective of the public survey for playground areas included providing accessibility and developing nature play. Participants in webinars also responded positively to developing the play facilities using ‘natural elements’ such as rough timbers, stone and surfacing that is readily available at Furnace Run Park. Since these elements will not be ‘pre-engineered’ by a playground equipment maker, care must be taken to ensure designs and construction create play facilities that are safe.

There are two basic guides that are the main source of information of guidance and standards for children’s play facilities. The Consumer Products Safety Commission released the *Public Playground Safety Handbook* in 2010 (<http://www.cpsc.gov/s3fs-public/325.pdf>) which serves as the trusted guide for building playgrounds that avoid injuries and are accessible for all. This guide provides design guidance, typical playground hazard identification, detailed maintenance checklists, and safety testing guidance. For design the handbook guides the process including:

- Selection of an appropriate site;
- Facility layout for accessibility, age separation, conflicts, sightlines, and supervision;
- Selection of appropriate equipment;
- Surfacing;
- Evaluation of equipment materials;
- Safe assembly and installation.

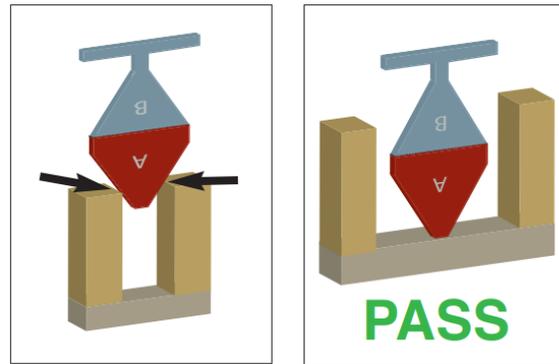


Figure 14: The CPSC Guide test template for head entrapment is one of several provided in the Public Playground Safety Handbook.

Surfacing of play areas is discussed in detail in the above guide, however the US Access Board and the National Center on Accessibility issued a guide specific to accessible playground surfacing, *Surfacing the Accessible Playground* <https://www.access-board.gov/files/ada/guides/play-surfaces.pdf>. The publication provides guidance and specifications for four types of accessible surfacing including cost comparisons, maintenance, and deficiencies over time.

A third important guide for playground design is the U.S. Architectural and Transportation Barriers Compliance Board *Guide to ADA Accessibility Guidelines for Play Areas* <https://www.access-board.gov/files/ada/guides/play-areas.pdf> which provides a comprehensive illustrated guide for creating accessible play areas and structures. The document includes a step-by-step guide through accessing the design, evaluating needs and determining how to fill those needs consistent with the ADA Accessibility Guidelines.

Nature Play – Furnace Run Park is will provide ample nature play opportunities without the need to formalize play facilities throughout the park site. WeConservePA has a detailed guide, *Nature Play: Nurturing Children and Strengthening Conservation through Connections to the Land* for encouraging nature play in public parks, https://conservationtools.org/library_items/1360/files/1259. The guide

provides simple common-sense examples of outdoor play that can be incorporated throughout Furnace Run taking advantage of the variety of settings, and natural and man-made features.

Among the recommendations for taking advantage of and making these ‘nature playscapes’ better that would apply to Furnace Run the guide includes (quoted directly from the guide):

- *Butterfly gardens: Collections of native perennial flowers, annual flowers, and herbs attract and feed the larva and adult forms of butterflies and other pollinators.*
- *Climbing logs and hollow logs: Individual logs or even large, multi-trunk sections of dead trees can be secured on the ground for climbing and balancing, while hollow logs are great for crawling and hiding in.*
- *Shallow water features: Perhaps no natural element is as enticing for children’s play as water. The best and safest option is a very shallow stream with small rocks that kids can use to build dams and chutes.*
- *Narrow paths cut through tall grass, shrub thickets, or dense woods: Children like the adventurous feel of tight, twisting paths amidst high vegetation—and all the better if there’s a hidden yet delightful destination at the end of the path, like a hammock chair or a small stick den.*
- *Digging pits and dirt mounds: Dirt play, going either up or down! These places can keep children occupied for hours*
- *Large landscapes of sand: Similar to dirt play, but also excellent for artistic creations when water is available.*
- *Tree stumps for balancing: Set variable-height, vertical stumps in a line or circle, so kids are challenged to step from one to another. If any of the stumps are taller than 24 inches, provide an appropriate depth of fall surface (e.g., mulch), per the Consumer Product Safety Commission’s (CPSC) Playground Safety Handbook*
- *Tree houses or forts: Simple structures can serve as pretend play settings. If elevated above 24 inches, they should have safety railings and/or appropriate fall surfaces.*
- *Sticks, branches, bamboo poles, and cattails for building forts: It’s even better to have children design and build their own structures. You can assist by providing a supply of basic construction materials.*



- *Vine teepees or sunflower houses: You can easily create these “plant houses” for play. Grow thick vines on a simple teepee structure made of branches or long garden stakes, with a gap left as an entrance.*
- *Shrub thickets: Dense shrubs can provide lots of intimate playspaces—as simple as kids crawling beneath the arching branches of forsythias planted against a fence, or as tempting as a secret clearing cut into the middle of a large sumac thicket.*
- *Berry patches and fruit trees: Picking their own fruit treats is a rare experience for many urban children.*
- *Quiet spaces: Peaceful, reflective nature play is just as valuable as more active play. Provide low hammocks, bench swings, comfy chairs, or small patches of grass—all tucked away in quiet, sheltered nooks where children can read, have a quiet chat with their best friends, or simply watch the clouds or birds.*
- *Homes for all: Welcome other species with bird houses, toad houses, insect hotels, rock piles, and brush piles—all of which are likely to draw colorful and interesting species into children’s close view.*
- *Leaves: For the ultimate in simple nature play features, how about a giant pile of leaves?*



8.11. Nature Education

During our stakeholder interviews, there was great interest in utilizing the diversity of natural settings at the park for nature study. This would include college field studies, high school and middle school earth science field labs, and special events such as a 'bio-blitz' and summer nature education.

Recommendations for advancing nature education at Furnace Run Park include:

- Partnering with Penn State Mont Alto, Shippensburg State and Wilson College to offer youth and adult education programs
- Partner with local school districts for earth science field studies
- Establish nature trails that feature the diversity of the site
- Host Bio-Blitz events
- Offer use of site for college student programs beneficial to the park



Figure 15: Waterbodies found in Furnace Run Park will provide a unique opportunity for nature education.

The National Wildlife Foundation (NWF) in *Connecting Kids and Nature: Our Approach* (<https://www.nwf.org/Kids-and-Family/Connecting-Kids-and-Nature>) recommends:

- *Working with Teachers and Youth Organizations - to provide ongoing nature and outdoor programming to schools, childcare centers, park agencies, and other institutions to create a lasting base of environmental literacy, stewardship, and problem-solving skills.*
- *Inspiring Parents and Caregivers - Through resources like our Ranger Rick® magazines and practical tool and tips, as well as special events, we aim to instill a love of nature in children and help parents incorporate regular outdoor time into their children's days.*
- *Influencing Policy Makers - Reach out to decision makers recognize the integral role outdoor time plays in the health and well-being of our nation's kids and our environment, advocating for them to pass policies that help children, youth, and families spend regular time outdoors.*

The NWF also points out, "Connecting children and nature has important health benefits. Studies show outdoor time helps children grow lean and strong, enhances imaginations and attention spans, decreases aggression, and boosts classroom performance. In addition, children who spend time in nature regularly are shown to become better stewards of the environment. "

8.12. Habitat protection and restoration

There is a need for long term habitat protection and enhancement at Furnace Run Park. Actions will be needed which might include projects that will protect groundwater, strengthen the capacity for local wildlife and ensure desirable native plant and animal communities are dominant. There is potential to establish the site as a field station for local environmental study by local college and high school students in support of these efforts.



- Protect and Enhance Natural Buffering at Park Boundaries
 - Supplement plantings at park boundaries with private properties
 - Manage invasive plants
- Habitat De-fragmentation
 - Infill woodland, meadow habitat gaps
- Rehabilitate Site Soils
 - Supplement poor surface soils with topsoil and compost
- Protect and Enhance Surface Water Habitats
 - Enhance wetlands, ponds, streams for aquatic species

8.13. Cultural, Natural History and Archaeology

The history of the South Mountain is told in several nearby sites and there may be a new history story to be told here at Furnace Run. In addition to the mining of valuable construction aggregates at the site, there is anecdotal and historical evidence that the site was used for making charcoal and may also have been the site of an iron furnace. Other cultural heritage links may be found to the civil war as well as to the Underground Railroad. The site has an important natural history link as Furnace Run was part of the early source of municipal water and the site currently is adjacent to the primary source of well water for the area.

A thorough study of the site history will be needed and may create additional opportunities. Faculty at Shippensburg University has expressed an interest in leading history and archaeological site research at Furnace Run. This could lead to the recovery of historic artifacts which may be overlooked and discarded and lost. It could also result in additional interesting stops along the internal trail networks.



Figure 16: Completed Charcoal pit during the slow burn. Source ExplorePAhistory.com

8.14. Sustainable design features

Sustainable design practices will achieve a number of desirable effects on the site, helping reduce both development and maintenance costs. Recycling at the park can be accomplished in several forms. Community yard waste composting can be carefully sited and the resulting compost will aid in re-establishing topsoil in areas where mining has left sterile surface soils. Utilizing available natural materials, including trees relocated from construction sites, timbers for buildings scheduled for demolition can serve to the park in the form of new facilities and site features.

- Green Infrastructure Practices
 - Utilize porous pavements where practical
 - Develop BMP's for 100% treatment of runoff
 - Pilot specialized GI demonstrations such as green roof
- Community Yard Waste Composting
 - Partner with other composting entities
 - Establish a composting facility at the Park
- Recycling Construction Materials
 - Utilize on-site natural materials wherever practical for park facilities
 - Adaptively re-use timber from demolished buildings
 - Use onsite soils for natural pavements
- Adaptive Reuse of Existing Site Features
 - Repair and reuse existing site structures wherever possible

8.15. Universal design and accessibility considerations

A. Universal Design Principles - Planning trails by applying the 7 Principles of Universal Design, also highlight the Accessible Design BMPs for trails, and help address the Four Sustainability Factors in the trail design process. For example, habitat conditions such as wetlands, present as much a challenge to designing and building an environmentally sustainable trail as they do in planning and creating a wet environment trail for diverse groups of users, including those with disabilities. Defined as the design of an environment, so that it might be accessed and used in the widest possible range of situations without the need for adaptation, Universal Design consists of Seven Principles that can be applied to many aspect of the constructed trail and related structures.

PRINCIPLE ONE: Equitable Use - The design is useful and marketable to any group of users.

Guidelines:

- 1a. Provide the same means of use for all users: identical whenever possible; equivalent when not.
- 1b. Avoid segregating or stigmatizing any users.
- 1c. Provisions for privacy, security, and safety should be equally available to all users.

PRINCIPLE TWO: Flexibility in Use - The design accommodates a wide range of individual preferences and abilities.

Guidelines:

- 2a. Provide choice in methods of use.
- 2b. Accommodate right- or left-handed access and use.
- 2c. Facilitate the user's accuracy and precision.
- 2d. Provide adaptability to the user's pace.

PRINCIPLE THREE: Simple and Intuitive Use - Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

Guidelines:

- 3a. Eliminate unnecessary complexity.
- 3b. Be consistent with user expectations and intuition.
- 3c. Accommodate a wide range of literacy and language skills.
- 3d. Arrange information consistent with its importance.
- 3e. Provide effective prompting for sequential actions
- 3f. Provide timely feedback during and after task completion.

PRINCIPLE FOUR: Perceptible Information - The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Guidelines:

- 4a. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information.

- 4b. Provide adequate contrast between essential information and its surroundings.
- 4c. Maximize "legibility" of essential information in all sensory modalities.
- 4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
- 4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

PRINCIPLE FIVE: Tolerance for Error - The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Guidelines:

- 5a. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded.
- 5b. Provide warnings of hazards and errors.
- 5c. Provide fail safe features.
- 5d. Discourage unconscious action in tasks that require vigilance.

PRINCIPLE SIX: Low Physical Effort - The design can be used efficiently and comfortably and with a minimum of fatigue.

Guidelines:

- 6a. Allow user to maintain a neutral body position.
- 6b. Use reasonable operating forces.
- 6c. Minimize repetitive actions.
- 6d. Minimize sustained physical effort.

PRINCIPLE SEVEN: Size and Space for Approach and Use - Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines:

- 7a. Provide a clear line of sight to important elements for any seated or standing user.
- 7b. Make reach to all components comfortable for any seated or standing user.
- 7c. Accommodate variations in hand and grip size.
- 7d. Provide adequate space for the use of assistive devices or personal assistance.

B. Providing ADA Compliant Trail-Related Amenities - This Master Plan recommends that trail site related amenities, including benches, seats, tables, kiosks, etc., should comply with the technical requirements for outdoor constructed features of ADAAG. (<https://www.access-board.gov/adaag-1991-2002.html>) In addition, trail related amenities such as fire rings, tent platforms, etc. that do not fall within the 2010 ADA Design Standards, should consider Best Management Practices as detailed in the The Outdoor Developed Areas Accessibility Guidelines, September 26, 2013, issued pursuant to the Architectural Barriers Act. <https://www.fs.fed.us/t-d/pubs/htmlpubs/htm12232806/page04.htm>

The following resources provide comprehensive guidance and information that should be utilized by the Southampton Township and its professional project partners in the planning, management and execution of future trail projects as recommended in this masterplan. Taken as a whole, they provide an integrated planning and management library from which this Master Plan, as well as future project decisions can be made for planning, design and construction.

Universal Access Trails and Shared Use Paths Design, Management, Ethical, and Legal Considerations

This 2014 manual reviews Best Management Practices (“BMPs”) to utilize when planning, designing, constructing, and maintaining pedestrian trails for universal accessibility—for providing trails usable by all people, to the greatest extent possible, without separate or segregated access for people with disabilities. These BMPs, which derive from federal regulations, are mandatory for federal entities and those working on their behalf but voluntary for all others.

http://elibrary.dcnr.pa.gov/PDFProvider.ashx?action=PDFStream&docID=1742279&chksum=&revision=0&docName=CT_UniversalAccessTrails_141104A&nativeExt=pdf&PromptToSave=False&Size=6576568&ViewerMode=2&overlay=0

Pennsylvania Trail Design and Development Principles; Guidelines for Sustainable, Non-Motorized Trails

In this 2012 guide, there is a compilation of best practices and guidelines for the planning, design, construction, and management of your trail. Equally important, they present techniques for developing trails that create desirable and enjoyable experiences for your trail users. At the same time, these techniques employ sustainable design elements and construction practices that allow the trail to make use of natural systems so that the trail remains both physically and environmentally sustainable, which in turn leads to minimal maintenance and operational costs, making the trail economically sustainable over the long run. [https://conservationtools-](https://conservationtools-production.s3.amazonaws.com/library_item_files/1242/1141/Full_Guide.pdf?AWSAccessKeyId=AKIAIQFJLILYGVDR4AMQ&Expires=1616944425&Signature=B5EAzA5apc%2BdRF91EYpEte%2BNSf4%3D)

[production.s3.amazonaws.com/library_item_files/1242/1141/Full_Guide.pdf?AWSAccessKeyId=AKIAIQFJLILYGVDR4AMQ&Expires=1616944425&Signature=B5EAzA5apc%2BdRF91EYpEte%2BNSf4%3D](https://conservationtools-production.s3.amazonaws.com/library_item_files/1242/1141/Full_Guide.pdf?AWSAccessKeyId=AKIAIQFJLILYGVDR4AMQ&Expires=1616944425&Signature=B5EAzA5apc%2BdRF91EYpEte%2BNSf4%3D)

The USDA Forest Service Trail Construction and Maintenance Notebook (2007) still stands out as the best pocket sized, comprehensive training and execution guide for carrying out ongoing trail maintenance.

<https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf07232806/pdf07232806dpi72.pdf>

The USDA Forest Service Standard Trail Plans and Specifications are for the design, construction, and maintenance of National Forest System trails and trail bridges. These plans and specifications also are available for other Federal, State, and local agencies, communities, trail partners, volunteers, and entities. <https://www.fs.fed.us/managing-land/trails/trail-management-tools/trailplans>

IMPLEMENTATION PLAN AND TIMELINE - This Master Plan provides a blueprint to create sustainable trails. During the formal design and pre-construction phases, an implementation plan and timeline should be developed in close observation of the TMOs. Creating an implementation plan, will provide consistent progress for the rehabilitation of some Furnace Run Park areas, as well as, create sustainable management for new trails and related impacts to other areas of Furnace Run.

We recommend that the Advisory Committee develop and implement a plan and timeline that is tested against the public input prior to actual selection of individual trails/segments and the subsequent construction work. This will help to insure that trails prioritized for any type of TMO have both user and general public support. We recommend that such efforts should result in an official dedication or opening of trail segments, planned and timed in advance, to show steady progress over the life of the project. Public events, email broadcasts, media coverage and website postings should be utilized as part of the advanced planning and implementation process.

CONSIDERATIONS FOR TRAIL CONSTRUCTION

A Sustainable Trail . . .

- Is gentle not steep.
- Follows the contours of the Hillside.
- Meanders and undulates frequently to remove water from the trail surface.
- Is slightly out-sloped.
- Requires minimal annual maintenance.
- Should be safe, functional and aesthetically pleasing.

The Furnace Run Park trails should be sustainably designed, constructed and maintained to minimize erosion, and require minimal maintenance. Future, formal trail design should incorporate the characteristics of a “rolling contour trail” that has a gentle grade, follows the contours of the terrain, is slightly out-sloped, and meanders and undulates frequently to remove water from the trail surface and provide an interesting journey for the trail user. The trail corridor should appear as narrow as possible while still maintaining the required tread width of the three TMO classes shown in this Master Plan

For more information and design illustrations of trail construction items, refer to the design plan examples of the above trail features and structures, refer to the USDA Forest Service Standard Trail Plans and Specifications, Missoula, MT: USDA, Forest Service, Technology and Development Program website and related documents, as well as, plan sheets, for further technical understanding and review of the follow scope of work. <https://www.fs.fed.us/managing-land/trails/trail-management-tools/trailplans>

Also see Trail Construction and Maintenance Notebook - Missoula, MT: USDA, Forest Service, Technology and Development Program, [2007] <https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf07232806/pdf07232806dpi72.pdf>

New Construction is primarily comprised of the following scope of work.

8.16. Events

Furnace Run Park has open spaces that could both public and private community events. Stakeholder interviews revealed that some existing event venues are outgrowing the available space, thus alternative locations may be under consideration including relocating them to Furnace Run Park. The siting of these events should take several factors into consideration:

- Locate events remote from adjacent residences;
- Consider impacts on views from South Mountain;
- Site Preparation for temporary parking, tents, camping;
- Secondary emergency access or event access;
- Temporary restroom and shower locations.
- Dedicated First Friday Events area.

Several potential hosting sites exist or will exist at Furnace Run Park for everything from family picnics, to weddings, to seasonal special events and one of a kind private events. Likely interest will initially be centered around the Large Farmhouse building and site, as well as pavilion rentals. Some of the large open spaces could host larger events, such as Civil War Encampments, antique shows, performing arts events, art shows, outdoor markets, etc. Given the variety of settings at Furnace Run Park, Southampton might expect a wide range of commercial event hosting requests at the park including aerial adventure facilities, campouts, private retreats, adventure sports events and winter sporting events. All of these events will require the adoption of some kind of permit and use agreement structure, established by the Township to set ground rules and regulate how the events are operated. Rental of park facilities has the potential to yield important funding for management, maintenance and improvements at the park and help the Township reach their goal of a self-sufficient facility.



Large event tents can be erected in sheltered locations throughout Furnace Run Park.

Since the DCNR is the primary funder of Furnace Run Park, the guidelines used by the agency would likely be appropriate for adoption by the Southampton Township for the Park. DCNR has a series of authorizations and agreements that are required for use of State Park sites that the Township could use a templates or models for these future permits and use agreements.

One-time events in State Parks or Forests require only a letter of authorization for DCNR. These events (as appropriate to Furnace Run Park) are typified on DCNR's website as:

- Dog events
- Weddings
- Fishing tournaments
- Horseback riding
- Klondike derbies
- Paddle boarding
- Equipment demonstrations
- Disc golf tournaments
- Organized hikes
- Scout Campouts



Outdoor antique show and sale is a popular summer event in the northeast.

More intensive events and permission to sell food and refreshments requires a Special Activities Agreement for a State Park site private event.

A separate commercial activities agreement permit is required by DCNR to regulate private commercial activities that are conducted by organizations on DCNR park and forest sites. The commercial activities agreement covers activities in which a person, organization, or association conducts a for-profit event or business, where fees are charged above and beyond the administrative costs of the activity. These events were typified as:

- Organized hikes
- Equestrian rides
- Rock climbing
- Orienteering
- Snowmobile rides
- Fishing tournaments
- Guide services
- Ecotourism

8.17. Master Development Plan Alternatives

8.17.1. **Alternative 1:** *Leave the site undeveloped in its current state*

- Violation of DCNR Park Contract, potential forfeiture of grant funds
- Inconsistent with 2015 Comprehensive Plan Goals
- Township water supply aquifer would lack some protection
- Recreational needs in the community will remain unmet
- Facilities on park will not be protected and/or maintained
- The site could be subject to illegal use and vandalism
- Potential for incompatible non-recreational development adjacent to Michaux State Forest



8.17.2. **Alternative 2: (Preferred by Southampton Township)** *Develop a self-sustaining nature park with low impact design*

- Consistent with Park Contract and Township Comp Plan
- Provides needed public amenities
- Provides recreation for underserved area
- Highly compatible with surrounding residential uses and Michaux State Forest
- Will protect local water supply
- Will enhance habitat for plants and animals, soils and water resources
- Will provide for safe and secure use of the site features and buildings
- Will enhance the local quality of life and economy



8.17.3. **Alternative 3:** Create a highly developed major park site with extensive facilities

- Would serve more active recreational users
- Dedicated uses could result in user conflicts
- Site is not suitable for athletic fields due to topography, soils, groundwater
- May be in conflict with neighborhood
- May not be compatible with Michaux State Forest
- May not provide some needed recreational opportunities
- Could be incompatible with the need to protect the local water supply
- Would not enhance local plant and animal habitats



9.0 FOREST STEWARDSHIP PLAN

9.1. Plan Requirements

A forest management plan is a “site-specific” plan developed to address one or more environmental resource concerns on nonindustrial forestland where forestry-related conservation activities or practices will be planned and applied.



General Forest Management Plan Criteria:

- Meet Natural Resources Conservation Service (NRCS) quality criteria for the identified resource concern(s).
- Comply with Federal, State, Tribal, and local laws, regulations, and permit requirements.
- Meet the client’s objectives.
- A CAP-106 Forest Management Plan will contain, at a minimum, elements included in the national common forest management plan template, available from the NRCS Conservation Activity Plan Web site.

Background and Site Information:

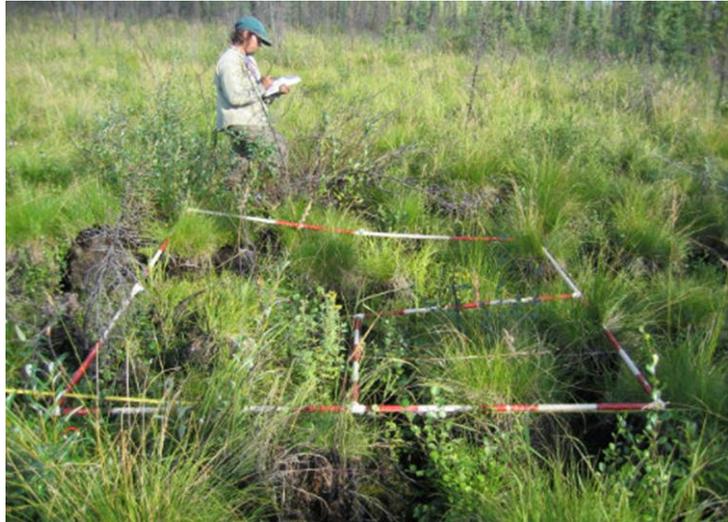
- Client information – Name, address, operation, size
- Location and plan map of parcel
- Documentation of existing practices
- Past harvest history
- Identification of resource concerns



Forester Measuring Diameter at Breast Height (DBH)

Develop Client objectives, which may include these considerations and others:

- Forest stand improvement
- Wildlife habitat/riparian areas
- Recreation
- Agroforestry
- Expected income
- Pollinator habitat and protection
- Existing Conditions



Identify resource concerns based on existing inventory to assess concerns and opportunities for management.

A forest inventory will be conducted using generally-accepted forest inventory methods. Describe the inventory process in the plan.

The inventory typically includes the following:

- Forest management unit and stand boundaries
- Basal area
- Trees per acre
- Diameter distribution by species
- Site index
- Soil conditions
- Slopes
- Topography
- Aspect
- Natural and cultural features
- Roads
- Wildfire risk (surface and crown fires)
- Risk of insect and disease infestation
- Product potential
- Fish and wildlife species and habitat elements
- Noxious and invasive species, water quality and other important features as applicable.

Documentation for the CAP-106 Forest Management Plan:

- Forest management plan map, including boundaries, fields, scale, north arrow, stand boundaries, and appropriate map symbols.
- Soils map, including legend, interpretations, and suitability ratings for forest activities.

- A wetland delineation map and associated wetland compliance documentation (Food Security Act of 1985), if applicable.
- Conservation plan (record of decisions) including resource concerns, planned practice(s) using the practice names and codes shown below, the amounts to be applied, and the schedule for implementation.
- Documentation of long-term goals for forest composition and structure to provide for intended future uses. Express the desired future forest attributes in terms of basal area, trees per acre, diameter distributions, and species composition.
- Resource assessment results (wind and water erosion, water availability, soil fertility, and others that may be needed)
- For management practices: The planned practices and the site-specific specifications on how each practice will be applied; when the practice will be applied; and the extent (acres or number) that will be applied.
- For engineering/structural practices: The planned practice, when it will be applied, the extent, and location on the forest management plan map.
- When any of the following practices are scheduled to be applied, the site-specific specifications shall be developed in the common forest management plan template, in a NRCS approved job sheet, or in a separate plan. A CAP-106 Forest Management Plan may include as appropriate, but is not limited to, the conservation practices listed below:

Primary Practices:

- 311 – Alley Cropping
- 379 – Multi-Story Cropping
- 380 – Windbreak / Shelterbreak Establishment
- 381 – Silvopasture
- 383 – Fuel Break
- 384 – Woody Residue Treatment
- 391 – Riparian Forest Buffer
- 394 – Firebreak
- 472 – Access Control
- 490 – Tree/Shrub Site Preparation
- 612 – Tree/Shrub Establishment
- 650 – Windbreak / Shelterbreak Renovation
- 654 – Road/Trail/Landing Closure and Treatment
- 655 – Forest Trails and Landings
- 660 – Tree/Shrub Pruning
- 666 – Forest Stand Improvement

Alternate Practices:

- 314 – Brush Management
- 315 – Herbaceous Weed Treatment
- 327 – Conservation Cover
- 338 – Prescribed Burning
- 342 – Critical Area Planting
- 382 – Fence
- 395 – Stream Habitat Improvement & Management
- 560 – Access Road
- 578 – Stream Crossing
- 580 – Streambank & Shoreline Protection
- 595 – Integrated Pest Management
- 643 – Restoration of Rare or Declining Natural Communities
- 644 – Wetland Wildlife Habitat Management
- 645 – Upland Wildlife Habitat Management
- 647 – Early Successional Habitat Development / Management

9.2. Planning & Management Objectives

Furnace Run Park is primarily composed of (3) distinct ecological habitat ecotypes which include Aquatic/Riparian Zones, Uplands/Transitional and Woodlands Zones.

Aquatic & Riparian Zones:

- Conduct an overall site evaluation and wetland delineations as required throughout the tract for all Aquatic and Riparian Zones. Areas of investigation should include vegetated areas surrounding ponds, riparian zones adjacent to furnace run, and identification of any vernal pools, spring seeps, natural drainage channels, or other areas exhibiting hydrophitic vegetation or wetlands hydrology in order to generate detailed wetlands and riparian mapping for the site.



Wetland Classification Methodology

- Utilize GPS Mapping to delineate the limits of all aquatic, wetlands and riparian areas. GPS data should be combined with existing site mapping (CAD File) to generate detailed mapping of Aquatic and Riparian Zones for inclusion in the stewardship plan.
- **Baseline Assessment:** Development of a Baseline Assessment for Aquatic and Riparian Zones which would include initial environmental site investigation, detailed mapping, and data collection to determine baseline metrics of existing habitat quality and functionality. The initial Baseline assessment would be utilized to develop existing definitions of habitat quality and quantity in order to set performance standards for future comparisons of monitoring data and for utilization and incorporation in developing maintenance objectives and proposed maintenance implementation plans.
- **Performance Standards:** Performance standards should be established to measure the ability of the Aquatic and Riparian Zones to accomplish short-term and long-term enhancement goals and stewardship plan objectives. The following performance standards have been provided as an example of what could be established for Aquatic and Riparian Zones:
 - Aquatic vegetation establishes at least 85% cover in their planting zones and planting zones cover at least 10% of the aquatic/wetland area
 - Emergent wetland vegetation establishes at least 85% cover in its planting zone and the planting zone covers at least 25% of the aquatic/wetland perimeter
 - Live willow stakes plantings exhibit at least 50% survival
 - Herbaceous ground cover of riparian/wetlands habitats is at least 85%

- Herbaceous ground cover of riparian/wetlands habitats exhibit at least 65% of the seeded species
 - Invasive weed cover in riparian/wetlands habitats is no more than 15%
 - Improvement with habitat structures and nesting boxes with ongoing maintenance and monitoring objectives
 - Waterfowl are observed utilizing the aquatic/wetland area nesting structures
 - Bluebird or other bird species are documented using nesting boxes
 - Turtles and frogs are observed within the aquatic/wetland areas or utilizing habitat structures (i.e. basking platforms)
- **Monitoring Plan:** Aquatic and Riparian Zones should be monitored at minimum annually to characterize their overall condition and progress towards meeting established performance standards. However, bi-annual inspections may be of benefit as a spring inspections in (May/June) is typically recommended to evaluate survival status of shrubs within any riparian or lowland areas when they are more easily visible due to less foliage, and to further identify any potential issues that require immediate response prior to the bulk of the growing season. Evaluation in (August/early September) is also highly recommended to identify the highest number of herbaceous plant species when they are in flower and more easily identifiable.

Aquatic Vegetation: Aquatic vegetation monitoring will consist of evaluating the density and extent of aquatic plants in and around each pond, waterbody or wetland areas exhibiting year round hydrology. Density of aquatic plants are typically assessed using three (3) 1-square meter sampling plots randomly distributed throughout the aquatic planting areas. The species, number, and percent cover for each species will be visually determined and recorded for each plot. The plot data will be merged to determine the metrics for the aquatic plant density and the results will be compared against the 85% ground cover performance standard.



Biologist performing Aquatic Vegetation Sample Pots

The extent of aquatic plants are typically evaluated by walking the perimeter of the aquatic plant communities of each aquatic/wetland area and recording the coordinates of zone limits using a hand-

held GPS unit. The aquatic plant polygons will be plotted on site plans and the percent cover of aquatic plants across the entire aquatic zone area will be digitally calculated using GIS software. The aquatic plant area in each aquatic zone will be compared to the 10% aquatic plant cover performance standard.

Wetland Fringe Vegetation: Wetland monitoring will consist of evaluating the density and extent of wetlands around each wetland area and characterizing their vegetative communities. The percent cover of wetland plants in the wetland fringe is typically assessed using five (5) 1-square meter sampling plots randomly distributed throughout the wetland fringe. The species, number, and percent cover for each species would be visually determined and recorded for each plot. The plot data is then merged to determine the metrics for the wetland plant community and the results will be compared against the 85% ground cover performance standard.



Emergent Wetland Vegetation - Forrest Wetlands

The extent of the wetland fringe would be evaluated by walking the perimeter of the wetlands and recording the coordinates of the limits using a hand-held GPS unit. Wetland polygons would be plotted on site plans and the percent wetland cover will be digitally calculated using GIS software. The field-determined wetland extent will be compared to the 25% wetland cover performance standard.

Evaluation of the percent survival of any plantings as part of prior aquatic or riparian habitat enhancement efforts. Monitoring of the planted live stakes or seedlings consist of counting the number of live stakes at each location and comparing the surviving number to the number planted to calculate the percent survival. Percent survival would be compared to the survival performance standard.

Wildlife Presence/Use: The presence of wildlife within Aquatic and Riparian Zones is the best indicator of habitat enhancement and stewardship success. Aquatic, wetlands and riparian habitats can be enhanced via the installation of habitat structures to provide food, cover, and nesting opportunities for a variety of terrestrial and aquatic wildlife species. During formal monitoring events and informal site visits by township staff or park attendees, wildlife species observed within the limits of the Aquatic and Riparian Zones should be recorded as an indicator of site use. Any nest boxes, turtle basking platforms or other habitat structures that would be installed should be inspected during the spring and summer monitoring events to determine use and productivity. All observed wildlife species or indicators of their

presence, should be recorded and tabulated throughout the year in order to better document wildlife use of the Aquatic and Riparian Zones.



Aix sponsa – Wood Duck Nest Box

Monitoring Reports: Monitoring reports should be prepared at a minimum of once per year, based off of initial Monitoring Plan data collection procedures and habitat enhancement and maintenance objectives in order to summarize the results of the monitoring and maintenance activities performed each year. Monitoring reports should include the times, dates, and personnel performing the monitoring events, and present tabulated results of the data collected in the field. The report should compare the monitoring results data to relative performance standards identified in the initial Monitoring Plan, in order to develop conclusions regarding the status of the enhanced riparian wetlands habitats. Data and observations collected during monitoring activities should be compared against initial Baseline Assessment Data and the Performance Standards established in the initial Monitoring Plan that was developed in order to evaluate current habitat status and to track the development of riparian and wetlands habitat areas toward meeting project goals and objectives. If monitoring results identify deficiencies in any component of the habitat enhancements or performance standards identified in the Monitoring Plan, recommendations should be included for future or ongoing maintenance activities that should be implemented to address the specific problem identified. Reports should include recommendations for maintenance activities, such as wildlife habitat improvements, supplemental seeding, invasive weed treatment/removal, supplemental plantings, replacement species, or improved plant protection to address any deficiencies in target species of wildlife and vegetation. A schedule for the implementation of the proposed recommendations should be included in the Monitoring Reports for each year.

- **Maintenance Plan & Reporting:** A Maintenance Plan with annual reporting should be developed to identify potential maintenance activities that should be implemented for Aquatic or Riparian Zone habitat improvements each year. The need for and type of maintenance to be implemented is defined by results and recommendations of annual monitoring events that have identified one or more deficiencies of the aquatic and riparian habitats to meet performance

standards established for that zone. Such comparison are utilized to evaluate habitat enhancement success which will heavily focus on vegetation in and around the ponds, adjacent to streams and within riparian corridors (i.e. lowland/floodplain zones), but also includes new installation or replacement/repair of habitat structures and nest boxes to encourage colonization of the aquatic and riparian habitats by a variety of target wildlife species. The maintenance plan should identify actions to be taken to address observed deficiencies in the Aquatic and Riparian Zone habitats each year and ultimately relies upon sufficient data collected from the monitoring data and events performed each year.

Uplands & Transitional Zones:

- Conduct an overall site evaluation as required throughout the tract for study of all uplands and transitional zones. Areas of investigation should include agricultural fields, meadows, uplands, grasslands, lowlands (outside of wetlands and riparian designated area), hedgerows, transitional cover zones, thickets, or any thick low vegetated areas adjacent to woodlands or aquatic zones or along property boundaries in order to generate detailed mapping of all uplands and transitional zones for the site.



Wildflower Trail - Meadow Restoration

- Utilize GPS Mapping to delineate the limits of all uplands and transitional zones. GPS data should be combined with existing site mapping (CAD File) to generate detailed mapping of Uplands and Transitional Zones for inclusion in the stewardship plan.
- **Baseline Assessment:** Development of a Baseline Assessment for Uplands & Transitional Zones which would include initial environmental site investigation, detailed mapping, and data collection to determine baseline metrics of existing habitat quality and functionally. The initial Baseline assessment would be utilized to develop existing definitions of habitat quality and quantity in order to set performance standards for future comparisons of monitoring data and

for utilization and incorporation in developing maintenance objectives and proposed maintenance implementation plans.

- Performance Standards: Performance standards should be established to measure the ability of the Uplands and Transitional Zones to accomplish short-term and long-term enhancement goals and stewardship plan objectives. The following performance standards have been provided as an example of what could be established for Uplands and Transitional Zones:
 - Native herbaceous vegetation established at least 85% cover in Uplands and Transitional zones and cover at least 75% of any newly vegetative areas (i.e. restored quarry soils.
 - Shrub density is at least (+/- 200-400) per acre in any shrub planting buffer areas
 - Any live stake plantings exhibit at least 50% survival
 - Herbaceous ground cover in any restored Uplands and Transitional zones habitats exhibit at least 65% of the seeded species
 - Invasive weed cover is no more than 15% cover in Uplands and Transitional zones
 - Improvement with nesting boxes with ongoing maintenance and monitoring objectives
 - Target species of interest are observed utilizing the Uplands and Transitional zones and any installed nesting or habitat structures (i.e. bird boxes, bat boxes, bee hives, etc.)
- Monitoring Plan: Uplands and Transitional Zones should be monitored at minimum annually to characterize their overall condition and progress towards meeting established performance standards. However, bi-annual inspections may be of benefit as a spring inspections in (May/June) is typically recommended to evaluate survival status of shrubs within any uplands or transitional areas when they are more easily visible due to less foliage, and to further identify any potential issues that require immediate response prior to the bulk of the growing season. Evaluation in (August/early September) is also highly recommended to identify the highest number of herbaceous plant species when they are in flower and more easily identifiable.

Uplands & Transitional Zone Vegetation: Transition areas should be developed throughout the Furnace Run tract to better connect the parks lowlands and riparian aquatic areas with their adjacent forestlands in order to establish dense cover and native food sources for terrestrial wildlife and opportunities for pollinator foraging. Herbaceous vegetation monitoring will consist of evaluating the density and diversity of the plant community of the Transition and Uplands Zones. The percent cover of each plant species in the transition zones will be assessed using ten 1-square meter sampling plots randomly distributed though the zone. The species, number, and percent cover of each species will be visually determined and recorded for each plot. The plot data will be merged to determine the metrics for the transition zone plant community and the results will be compared against the 85% ground cover and less than 15% weed cover performance standards. In addition, a meander survey will be performed in the transition zones to identify all identifiable plant species present for comparison against the performance standard requiring at least 65% of seeded species to be present.



Early Successional - Transitional Zone

Upland Shrubs: Shrubs and live stake plantings area recommended within areas of proposed transition to diversify habitat, generate safe travel corridors and connectivity between each ecotype present on the property, and to provide food sources for terrestrial wildlife, and nesting habitat for birds. Shrub status of Uplands and Transitional zones acts as an immediate indicator of Transitional Zone performance. Site evaluation of shrub status should be performed during spring monitoring events when herbaceous vegetation is not tall enough to hide the shrubs. Shrub assessments will consist of walking the Transition areas and Uplands Zones and counting and recording the species of all live shrubs encountered. The number of live shrubs will be compared to the target shrub density performance standard of (+/- 200-400) shrubs per acre to evaluate the shrub status (roughly one plant per 100 square feet or 10 feet on center).



Planted Shrub Buffer - Transition Zone

Shrub status in any recent planting areas would be performed differently due to the large number of shrubs planted there. Assessment of shrub status in new planting zones would be performed using sample plots to determine if the target number of shrubs per acre are present. Ten, 10 meter by 10 meter sample plots could be established randomly through any shrub buffer planting areas and the number and species of all live shrubs in the plot will be recorded. The plot data would be merged to determine the shrub metrics and the results will be compared against the established shrubs per acre performance standard (roughly one plant per 100 square feet or 10 feet on center).

Wildlife Presence/Use: The presence of wildlife within Uplands and Transitional Zones is the best indicator of habitat enhancement and stewardship success. Uplands and Transitional Zone habitats can be enhanced via seeding to generate select species of interest for wildlife attraction or the installation of habitat structures to provide food, cover, and nesting opportunities for a variety of terrestrial wildlife species. During formal monitoring events and informal site visits by township staff or park attendees, wildlife species observed within the limits of the Uplands and Transitional Zones should be recorded as an indicator of site use. Any nest boxes, or other habitat structures that would be installed should be inspected during the spring and summer monitoring events to determine use and productivity. All observed wildlife species or indicators of their presence, should be recorded and tabulated throughout the year in order to better document wildlife use of the Uplands and Transitional Zones.



American Woodcock – Scolopax minor

Monitoring Reports: Monitoring reports should be prepared at a minimum of once per year, based off of initial Monitoring Plan data collection procedures and habitat enhancement/maintenance objectives in order to summarize the results of the monitoring and maintenance activities performed each year. Monitoring reports should include the times, dates, and personnel performing the monitoring events, and present tabulated results of the data collected in the field. The report should compare the monitoring results data to relative performance standards identified in the initial Monitoring Plan, in order to develop conclusions regarding the status of the enhanced riparian wetlands habitats. Data and observations collected during monitoring activities should be compared against initial Baseline Assessment Data and the Performance Standards established in the initial Monitoring Plan that was developed in order to evaluate current habitat status and to track the development of riparian and wetlands habitat areas toward meeting project goals and objectives. If monitoring results identify deficiencies in any component of the habitat enhancements or performance standards identified in the Monitoring Plan, recommendations should be included for future or ongoing maintenance activities that should be implemented to address the specific problem identified. Reports should include

recommendations for maintenance activities, such as wildlife habitat improvements, supplemental seeding, invasive weed treatment/removal, supplemental plantings, replacement species, or improved plant protection to address any deficiencies in target species of wildlife and vegetation. A schedule for the implementation of the proposed recommendations should be included in the Monitoring Reports for each year.

- **Maintenance Plan & Reporting:** A Maintenance Plan with annual reporting should be developed to identify potential maintenance activities that should be implemented for Uplands and Transitional Zone habitat improvements each year. The need for and type of maintenance to be implemented is defined by results and recommendations of annual monitoring events that have identified one or more deficiencies of the Uplands and Transitional Zones to meet performance standards established for that zone. Such comparison are utilized to evaluate habitat enhancement success which will heavily focus on vegetation in and around existing or newly developed transitional areas, but also includes new installation or replacement/repair of habitat structures and nest boxes to encourage colonization by a variety of target wildlife species. The maintenance plan should identify actions to be taken to address observed deficiencies in the Uplands and Transitional Zones habitats each year and ultimately relies upon sufficient data collected from the monitoring data and events performed each year.

Woodlands Zones:

- Conduct an overall site evaluation as required throughout the tract for study of all woodlands zones. Areas of investigation should include mature forest, hardwoods, hedgerows or tree lines, clear-cuts, or any mature (second or third stage of succession) vegetated areas adjacent to aquatic or transitional zones or along property boundaries in order to generate detailed mapping of all woodlands zones for the site.



Mature Canopy with Dense Healthy Understory

- Utilize GPS Mapping to delineate the limits of all Woodlands Zones. GPS data should be combined with existing site mapping (CAD File) to generate detailed mapping of Woodlands Zones for inclusion in the stewardship plan.
- Baseline Assessment: Development of a Baseline Assessment for Woodlands Zones which would include initial environmental site investigation, detailed mapping, and data collection to determine baseline metrics of existing habitat quality and functionally. The initial Baseline assessment would be utilized to develop existing definitions of habitat quality and quantity in order to set performance standards for future comparisons of monitoring data and for utilization and incorporation in developing maintenance objectives and proposed maintenance implementation plans.
- Performance Standards: A robust Monitoring Plan includes performance standards which are established to determine the ability of the Woodlands Zone habitats to accomplish their stated objectives. The following performance standards have been established for the Woodlands and adjacent Transitional Zone habitat areas:

Mature Canopy Area:

- Tree, shrub, vine, and herbs/forbs species inventory should equal or exceed species diversity of previous year
- Equal or greater tree abundance, average DBH, and species diversity compared to sample plot data from previous year
- Presence of at least 7 different tree species within each sample plot.
- Tree Canopy density is at least 80%
- Less than 15% of trees observed are in poor health or need to be removed/replaced
- Invasive species percent cover within hardwood stands is not more than 15%

Fringe Area (Select Cut & Hinge-Cut Areas):

- Understory growth of the early successional forest treatment zones should exhibit at least 25% cover by new recruits with
- Inspection of hinge-cut areas throughout the woodlands zones fringe, to examine and measure mortality, survival, and rate of disease
- Equal or greater Shrub abundance and species diversity in sample plot data from previous year
- Less than 15% of new understory species observed are in poor health or need to be removed/replaced.
- Invasive species within select cut and hinge-cut areas is not more than 15%.

Invasive Species (Woodlands Zones):

- Total number of invasive insect species observations during inspections is less than 1 per acre on average

- Invasive plant species along the fringe of Woodlands Zones (select cut / hinge-cut) and transition zones is no more than 15%
- Average total invasive weed cover in transitional habitats is no more than 15%

Wildlife Monitoring:

- All nesting boxes are present and in adequate condition for use
 - 25% of nesting boxes or habitat structures show evidence of use
 - Equal to or greater wildlife species diversity than recorded in previous year's wildlife survey
 - Identification of at least 3 target species such as American woodcock (*Scolopax minor*), Wild Turkey (*Meleagris gallopavo*), Ring-Necked Pheasant (*Phasianus colchicus*), Ruffed Grouse (*Bonasa umbellus*) and White-Tailed Deer (*Odocoileus virginianus*), Wood Duck (*Aix sponsa*), and Screech Owl (*Megascops asio*).
- Monitoring Plan: in conjunction with the accompany Baseline Report, a Monitoring Plan should be developed to examine the existing woodlands throughout the Furnace Run Tract in a more standardized manor by breaking up habitats into various zones based on habitat cover (type, abundance and density), as well as conducting woodlands vegetation survey plots and wildlife surveys to generate baseline data which can then be utilized for routine monitoring. Utilizing the data collected for comparison to future surveys performed on a bi-annual basis, the Stewardship Plan can identify appropriate and effective maintenance improvements to be performed based on established parameters and set goals for the Woodland Zones. The Monitoring Plan should develop and define data metrics and collection methods to establish performance standards that will be used to evaluate the status of the Woodland Zone areas over time. The Monitoring Plan should also identify monitoring methodologies that will be used to collect field data to characterize habitat conditions for comparison to the performance standards, in order to determine if examined site conditions are acceptable, or if maintenance activities are required in order for the Woodlands Zone habitats to meet their established performance standards and stewardship goal objectives.

Woodlands and Transitional Zones that include mature canopy should be quantitatively monitored annually based upon objectives that were developed to best characterize their condition and progress towards meeting established performance standards, as outlined in **Woodlands Monitoring Table** below. Inspections should be conducted in the fall (August-October) near the end of the growing season while the leaves are still on the trees.

Potential Woodlands Zone Stewardship and Monitoring Objectives:

- Evaluate the status and development of understory and midstory communities and early successional transition habitats between forest stands and herbaceous openings of all zones using vegetation surveys

- Evaluate the status and development of understory species along the perimeter of all zones in response to any hinge-cutting enhancements of midstory species using vegetation surveys
- Evaluate wildlife diversity through the performance of wildlife surveys
- Evaluate the use of the woodland areas by Screech Owls and other birds such as Wood Duck, Wild Turkey, Ruffed Grouse, and Woodcock by performing inspections to examine visual signs of the presence of each species and the condition and potential use of any nesting structures
- Evaluate the presence of invasive species in Woodland areas and Transitional Zones, specifically the understory, cut-lines and perimeter trails using vegetation surveys
- Evaluate the presence of invasive insect species (Spotted Lantern Fly, Gypsy Moth, Hemlock Woolly Adelgid, etc.) by visual survey and trap monitoring
- Evaluating the condition of nature trails through the woodland and adjacent habitats by visual survey

Woodlands Zones (Overall Site Assessment): An overall site evaluation should take place annual once during the spring and will include an annual cumulative on the ground survey of all species of the trees, shrubs, vines, grasses and forbs present within the Woodlands Zone observed. The data collected from this annual species survey shall be utilized to update an ongoing species list and be compared to existing data. Similarly the canopy, midstory, and understory should all be examined on a general basis of health (i.e. density of species in each, percentages of invasive cover, prevalence of disease or invasive insects, evidence of over browsing and the overall health of the species within each layer of the zone.

Woodlands Zones (Individual Assessment): Since the woodland habitat covers considerable acreage in total, smaller areas within the woodland habitats should be evaluated by utilizing sample plots. A minimum of (5), 0.10-acre fixed-radius plots (FRPs) for speciating and measuring DBH for canopy species over 10-inches in trunk diameter should be established within the mature canopy and more importantly along the managed woodlands fringe zones where select-cut or hinge-cutting has occurred. Each plot shall include the recording of total species, DBH and health of all trees (>10" DBH) within the plot. Similarly the number of species (<10" DBH) should be recorded for species inventory.



New plots shall be placed according to best judgement based on observed variability between zones and spaced equidistance between existing plots. Existing plot locations shall also be routinely surveyed each year to collect data which can be used in comparison of existing survey results. Plot location shall be recorded using a handheld GPS unit and imported into the woodlands zone Map for increased accuracy and reduced scientific error. For plots conducted in new growth areas that were managed by hinge-cutting or select-cutting or in areas of new shrub plantings, Height shall be measured as an additional metric. Examination and comparisons of data sets should include calculation of average (DBH), maximum and minimum (DBH), mature species inventory (>10" DBH), shrub species inventory (<10" DBH), and a compilation of cumulative overall observed species (Canopy, Midstory and Ground Cover). The plot data will be merged after each survey period to determine the average overall metrics and the results will be compared against the performance standards of previous years.

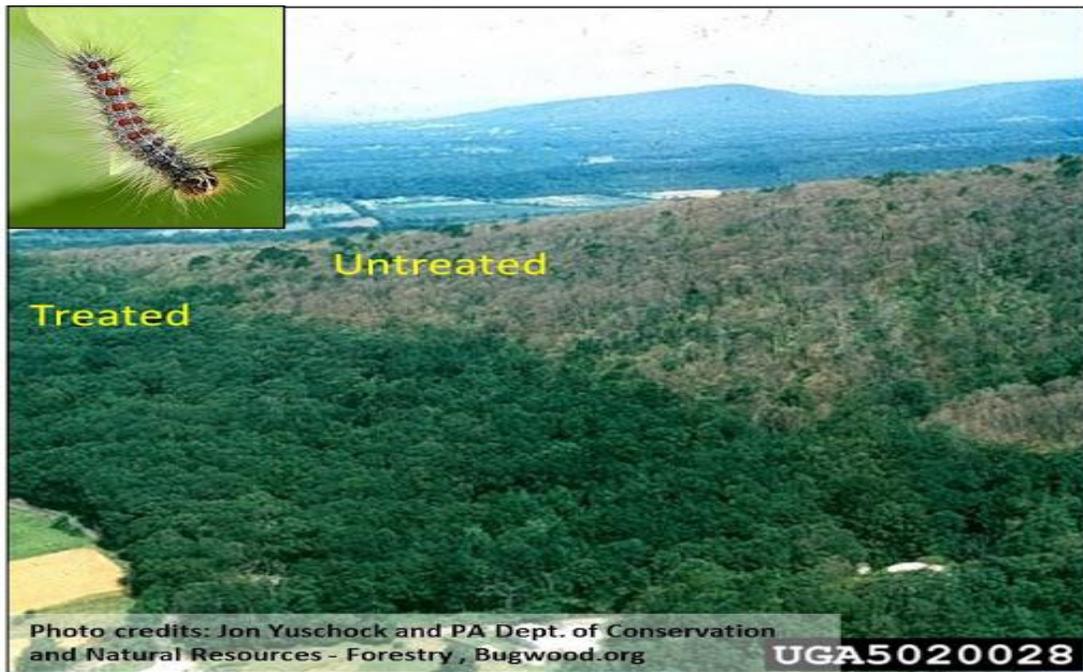
Woodlands Zones (Hinge-Cut & Select Cut): New transitional zone areas creating through (either select cut or hinge-cut) will be observed using a similar approach as the process described above under *Woodlands Zones (Individual Assessment)*. The observer will be responsible for conducting minimum of 5, 0.10-acre fixed radius sample plots throughout the managed areas and the number, species, and health of all trees within the plot shall be recorded. The survival rate of hinge-cut trees and new recruits shall also be noted. In addition, the observer will also visually determine the tree species and invasive species cover percentages present within the sample plots to make conclusions regarding the



development of the managed stands. The observer should be sure to inspect hinge-cut trees for early signs of disease or evidence of future mortality and assess options going forward. Similarly, visual inspection of select cut harvest areas throughout the woodlands zones fringe should also be conducted to quantify new understory growth and presence of competitive invasives. Fixed radius survey plots (FPR's) can also be utilized to examine and calculate the percentage of understory ground cover to determine the total

percentage of invasive species abundance in areas of high concentration. Examination of browsing on new recruits should also be noted and recorded. Data collected will be averaged and compared to previous data to determine the success of enhancement activities as well as identify the need for maintenance activities. Once the new hard stand areas reach >10" DBH, they will be considered part of the Woodlands Zone and will be evaluated as such.

Invasives Monitoring (Woodlands): Invasives monitoring in Woodlands Zones should consist of evaluating the density and diversity of the plant community of the transition and woodlands zones via the fixed radius sample plot techniques mentioned above. The percent cover of each plant species in the transition and woodlands zones will be assessed utilizing this methodology by an outside consultant (i.e. B&L Environmental Scientist). Similarly, all zones should be traversed by a member of the Furnace Run Park Conservation Team on a bi-monthly basis for routine inspection for the development of invasive plants and insects. During these bi-monthly walks the Park Conservation team members will make note of any portions of the zones that require immediate attention and make note of any invasive species encountered (plants or insects) and immediately alert the appropriate Township staff member responsible for eradication or planned maintenance. Development of an ongoing photo log of invasive species type and species identifiers would be beneficial to help Park Conservation Staff generate awareness and ability to identify invasives during daily site operations. Identification of invasives should be reported to individuals responsible for maintenance efforts in which extermination or planned removal should immediately follow.



Wildlife Presence/Use: The presence of wildlife within the Woodlands Zones is the best indicator of habitat enhancement and stewardship success. Woodlands Zone habitats can be enhanced via seeding to generate select species of interest for wildlife attraction or the installation of habitat structures to provide food, cover, and nesting opportunities for a variety of terrestrial wildlife species. During formal monitoring events and informal site visits by township staff or park attendees, wildlife species observed within the limits of the Woodlands Zones should be recorded as an indicator of site use. Any nest boxes, or other habitat structures that would be installed should be inspected during the spring and fall monitoring events to determine use and productivity. All observed wildlife species or indicators of their presence, should be recorded and tabulated throughout the year in order to better document wildlife use of the Woodlands Zones.



Trail cameras could be installed to manage wildlife along common trails or in areas of high interest. These cameras should be checked on a monthly basis and a log shall be kept to record species type, abundance, general location, time of day, and a short description of estimated activity. The photos should be logged in a spreadsheet and saved in a file for use in future monitoring reports. These trail cameras will often also capture rare moments of unique species that may never be observed in daylight or during routine wildlife surveys. This type of information is valuable in determine the presence of commonly nocturnal species as well as illusive species. Batteries and memory cards of trail cameras should be checked on a monthly basis and replaced as required.



Canis latrans - Coyote with Pup at Den

Woodlands Zone Monitoring Objectives			
Action	Frequency	Protocol	Persons/Group
Nature Trails	2x per month	Walk trail system and perform routine at least (2) times per month or as needed following large storm events and winter deadfall.	In-house Employees (Conservation Team)
Invasive Species	2x per month	Invasive species site survey by Township Staff. Survey should include walking the perimeter and interior Woodlands Zones conducting visual observation for plant and insect invasives. A report should be generated to record species type, abundance/prevalence, approximate location within each zone, and rate of regeneration or mortality in response to maintenance	In-house Employees (Conservation Team)
Brush Habitat Piles	2x per year	Inspect brush habitat piles throughout all zones, specifically along the cut-lines and transitional zones and Repair/Maintain as required. Remember to not remove woody-debris piles unnecessarily as they provide great habitat.	In-house Employees (Conservation Team)
Nesting Boxes	1x per month	Routinely inspect usage by target species and Repair/Maintain as required.	In-house Employees (Conservation Team)
All Zones (Species Survey)	1x per year	Conduct a cumulative tree, shrub, vine, and herbs/forbs species inventory of the woodland zones and transitional zones to identify both native and non-native and invasive species. Compare to existing data and issue report.	Outside Consultant (B&L)
Woodlands Zones (Canopy Survey)	1x per year	Conduct several 0.10-acre Fixed Radius Sampling Plots (37.2' radius) to evaluate the overall tree canopy within the woodlands zones by measuring diameter at breast height (DBH) and collecting canopy and midstory species inventory within each plot. Compare to existing data and issue report.	Outside Consultant (B&L)
Woodlands Zones (Canopy Health)	1x per year	Walk all zones & assess for overall canopy health (i.e. cover, leaf discoloration, dead branches / snags, etc.). Compare to existing data and issue report.	Outside Consultant (B&L)
Woodlands Zones (Midstory Health)	1x per year	Walk all zones & assess midstory health (i.e. leaf discoloration, disease, prevalence of invasives, dead branches, over browsing, etc.). Compare to existing data and issue report.	Outside Consultant (B&L)
Woodlands Zones (Understory Health)	1x per year	Walk all zones & assess understory health (i.e. competition by invasives, over browsing, leaf discoloration, disease, insect damage, etc.). Compare to existing data and issue report.	Outside Consultant (B&L)
Transition Zones (Select-Cut)	2x per year	Inspection of select cut harvest areas throughout the woodlands zones fringe to	Outside Consultant (B&L)

		examine new understory growth and presence of competitive invasives. Examination of browsing on new recruits. Compare to existing data and issue report.	
Transition Zones (Hinge-Cut)	2x per year	Inspection of hinge-cut areas throughout the woodlands zones fringe, to examine and measure mortality, survival, and rate of disease. Compare to existing data and issue report.	Outside Consultant (B&L)
Transition Zones (Understory Survey)	1x per year	Conduct several 0.10-acre Fixed Radius Sampling Plots (37.2' radius) to evaluate canopy and midstory species inventory within each plot for species with (DBH < 3"). Compare to existing data and issue report.	Outside Consultant (B&L)
Wildlife	1x month	Bait & Trail Cameras to assess species inventory of more elusive species. Prepare ongoing log and compare results.	In-house Employees (Conservation Team)
Wildlife	2x per year	Conduct wildlife survey in Woodlands Zones to generate an ongoing cumulative species inventory table as well as take note of observation dates/times, approximate location within each zone, and type of habitat or suspected food sources utilized by each species. Compare results to existing data and issue report.	Outside Consultant (B&L)

Maintenance Plan & Reporting: A Maintenance Plan with annual reporting should be developed to identify potential maintenance activities that should be implemented for Woodlands Zone habitat improvements each year. The need for and type of maintenance to be implemented is defined by results and recommendations of annual monitoring events that have identified one or more deficiencies of the Woodlands Zones to meet performance standards established for that zone. Such comparison are utilized to evaluate habitat enhancement success which will heavily focus on vegetation in and around existing hardwoods or newly developed transitional areas which include mature canopy, but also includes new installation or replacement/repair of habitat structures and nest boxes to encourage colonization by a variety of target wildlife species within the Woodlands Zones. The maintenance plan should identify actions to be taken to address observed deficiencies in the Woodlands Zones habitats each year and ultimately relies upon sufficient data collected from the monitoring data and events performed each year.

9.3. Forest Stewardship Sponsors and Potential Steward Groups

Universities:

Shippensburg University
Dickinson College
Penn State Mon Alto
Wilson College
Gettysburg College

Conservancies:

South Mountain Partnership
Friend of Michaux State Forrest
Audubon Society
Central Pennsylvania Conservancy
PA State Historic Preservation Office

Non-Profits:

Michaux Forest Association
Cumberland Area Economic Development Corporation
Cumberland Valley Visitors Bureau
Cumberland County Historical Society
Cumberland Valley Appalachian Trail Club
Franklin County Visitors Bureau
Keystone Trails Association
PA Forestry Association
Trout Unlimited

Local Clubs & Organizations:

Mountain Bikers of Michaux
Mountain / BMX Bike Groups
Wildlife Groups

10.0 PLAN IMPLEMENTATION

10.1. Suggested Actions

Action	Priority Level	Responsible Party	Probable Cost	Funding Source
Administration				
Establish Friends of Furnace Run Park	10	Project Advisory Committee	\$10,000	DCNR, Land Trust Alliance, Twp.
Establish Memorandum of Understanding for Furnace Run Park Park Supervisor/Ranger	10	Township Board of Supervisors	\$5,000	DCNR, Land Trust Alliance, Twp.
	10	Township	\$15,000	Township
Land Preservation Grant Opportunities – Future Acquisitions	10	Township	Not Known	DCNR, Land Trust Alliance, Twp.
Sustainability Improvement Grant Applications	10	Township	Not Known	DCNR
Park and Trail Development Grant Applications	10	Township	\$XX,000	Township
Furnace Run Park Dedication Event				
Pre-Development				
Boundary Establishment	10	Township	\$5,000	DCNR, Township
NPDES Compliance	10	Township	\$25,000	Township
Establish Rules of Use	10	Township	\$1,000	Township
Install Entrance Gates	10	Township	\$10,000	Township
Structural Evaluation of Remaining Buildings	9	Township	\$10,000	DCNR, LWCF, Township
Soils Evaluation for On-Site Septic	9	Township	\$5,000	DCNR, Township
Detailed Site Design – Gateway Park	10	Township	\$15,000	DCNR, LWCF, Township
Adaptive Re-Use Plans for Existing Site Structures	8	Township	\$20,000	DCNR, LWCF, Township

Action	Priority Level	Responsible Party	Probable Cost	Funding Source
Land Stewardship Activities				
Forest Management Plan	10	Township	\$25,000	DCNR, Township
Site Water Quality Improvements	9	Borough, Township	Not Known	
Wildlife Habitat Improvements – Transit Corridor Enhancements	10			
Environmental Education and Research	8			
Wetland Creation – South Pond	8	Township		Private Donors, Township
Water Resource Management	8	Township		DCNR, LWCF, Township
Shoreline Stabilization and Access Improvements	8	Township		DCNR, LWCF, Township
Archeological Research, Survey and Documentation	9	Township		Township, SU Volunteers?
Bio-Blitz	9	Township		Twp., SU, Wilson, PSU Mt Alto
Development Projects				
Main Blue Furnace Run Trail Water	10	Township	\$XX,000	DCNR, LWCF, Township
Restroom Facilities/Port-a-Potty Enclosures	10	Township	\$XX,000	
Plant installations by volunteers	10	Township	\$X,000	Private Donor, Volunteer Labor
Peripheral Pathways – Aqua, Yellow	9	Township	\$XX,000	DCNR, LWCF, Township
Entry Sign and Directional Signage	9	Township	\$XX,000	DCNR, LWCF, Township
Gateway Meadow Nature Play Area, Pavilion, Parking, Kiosk & Amenities	10	Township	\$XX,000	DCNR, LWCF, Township
Large Farmhouse Event Center, Parking, Building Rehab, Landscape	8	Township	\$XX,000	DCNR, LWCF, Township
Park Central Welcome Center, Shelter, Pavilions, Trails, Parking, Landscape	9	Township	\$XX,000	DCNR, LWCF, Township
Peripheral Connecting, Trails Network Completion	8	Township		DCNR, LWCF, Township

Action	Priority Level	Responsible Party	Probable Cost	Funding Source
Ongoing Site Investigations and Research				
Soils Research and Amendments	8			
Furnace Run Habitat Restoration	8			
Groundwater Enhancement Research	10			
Pond Habitat Research	8			
Woodland and Meadow Habitat Research	9			
Historical Research and Documentation	9			
Park Programming				
Summer Day Camp				
Adult Education				
Off-Site Improvements				
Off-Road Pedestrian and Bicycle Trail Connections Study				
Local Transit/Shuttle Service Extension to FRP				

10.2. Phasing – discussion and multiyear plan for implementing

Phase 1 Spring/Summer 2021 Budget (\$132,000 Twp.)

- NPDES Permit
- Donated Plant installation
- Stormwater and E&S Approvals (State, municipal and county level)
- Confirm boundaries and post boundary signage
- Identify Parking areas
- Entrance sign and Introductory gateway park facilities
- Trail construction – trunk trail to North Leg/along Furnace Run; South leg segment
- Building structural evaluations
- Restrooms, Port a John
- Nature Playground/Pocket Park 10 parking spaces
- Pavilions, Overlook Stations /Nature Viewing Areas

Phase 2 Spring/Summer 2022 Budget (\$132,000 Twp.)

- Formalize Parking and Visitor Facilities at Main Reception Area
- Formalize connection Michaux SF and Appalachian Trail
- Expansion of trails network
- Habitat restoration
- Expand and enhancements to pocket park

Phase 3-5 through 2025 (\$Budget TBD)

10.3. Permitting – set up a list of activities, agencies and permits required in a spreadsheet AJR

10.4. Anticipated cost – Utilizing PTL database as much as possible

10.5. Funding opportunities – AJR and LK, include discussion of leveraging, sources of local match?

11.0 OPERATIONS AND MAINTENANCE

11.1. Management responsibility

One of the challenges of municipal park ownership is determining the management structure that will best fit the facility and the goals of the community. Management can be done by an internal recreation department, while maintenance can be shared with the department of public works and volunteers. In many cases, duties are shared between programs at park facilities, and general maintenance frequently falls within the scope of day-to-day staff responsibilities. Depending upon the urgency and type of repair, immediate maintenance needs are addressed by a combination of park staff and public works staff.

Chain of Command and current staff responsibilities are important to the inventory of recreational programs. The organizational aspects of staffing and programming help to identify short- and long-range adjustments necessary for the type of facilities proposed and the park capacity to be served. This is important when making the necessary adjustments that result from plan recommendations. A list of typical personnel positions and simple hierarchy of staff at Furnace Run Park are shown in the chart below:

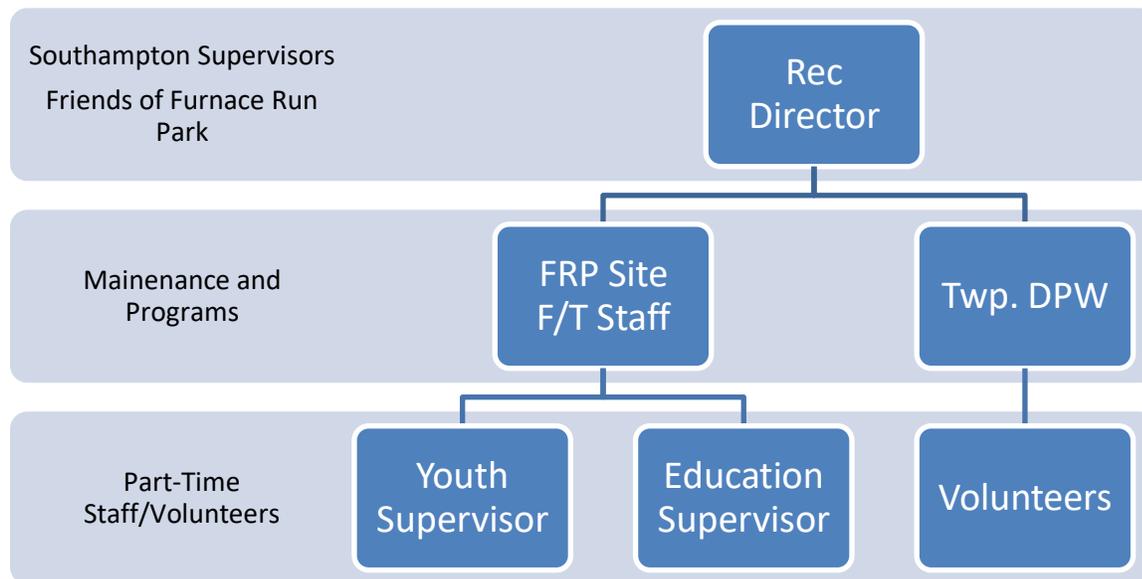


Figure 17: Sketch organizational chart for management of Furnace Run Park.

The above is a simple structure that would cover maintenance and summer recreation and education programs. For Furnace Run Park there are additional considerations for programming and management and a built-in local opportunity in the Shippensburg Community Parks and Recreation Authority. The SCPRA has the in-house capabilities to manage larger community-wide programs, facility rentals and private events that will be important to the Township in maintaining the fiscal sustainability of the park.

The Township and a new Friends of Furnace Run Park would be responsible for maintenance, youth recreation, youth and adult education, and making policy and procedural recommendations about park maintenance and operations. The Recreation director would be supervised and answer to the Board of Supervisors.

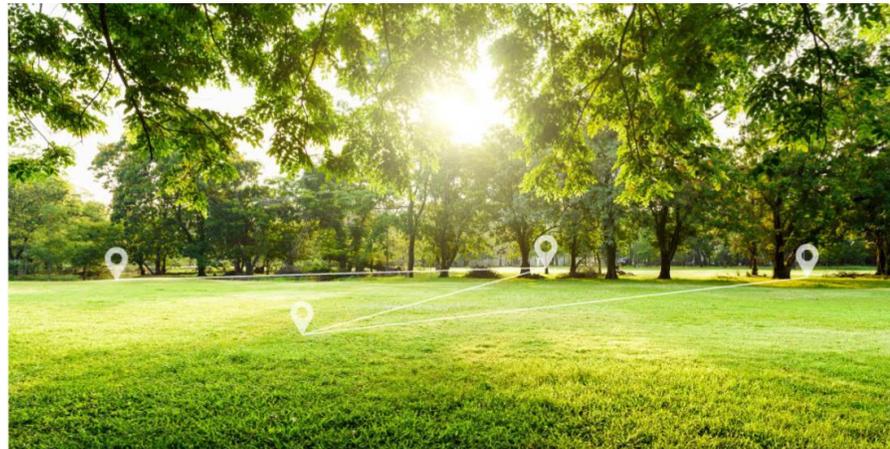
The Friends of Furnace Run Park would present and discuss policies that affect the park, develop events to encourage citizen participation, and approve events held in the park by individuals and other organizations. As a not-for-profit, the Friends would be able to establish fundraising goals to develop a park endowment to augment other funds when needed, fund start-up recreational activities, provide residents with funds when needed for recreational activities at the park, and fund ongoing recreation programs that are not self-supporting. It could also assist the Board of Supervisors by fundraising for major maintenance and facility improvement projects in the park. Operational details can be provided through bylaws to be approved by the Board of Supervisors and as detailed in a [Memorandum of Understanding](#).

Shippensburg Community Parks and Recreation Authority would help manage use of the facilities, meet with the Board of Supervisors to present and discuss proposals for events, manage park usage permits and be reimbursed by the Township from the proceeds for their related costs. [Samples of usage permits](#) are provided in the Appendices.

Maintenance of the park and facilities would be shared by the Township internal departments, likely lead by the DPW and a full time on-site Furnace Run Park Staff member. Some maintenance would also be the responsibility Part-time Summer Staff, as well as volunteers.

Maintenance requirements are discussed in further detail

below. Recreation departments are currently increasingly relying on technological advances in tracking and responding to needs for maintenance. Several companies have developed GIS-based smart phone apps that can be used by staff or park users, to report needed repairs, vandalism, general maintenance and general assessments of safety issues. This information is geo-coded with a location making it easy to catalog and plan maintenance and repair operations. We have included a description of an add-on to [Cityworks](#) management system software that serves several communities.



(<https://www.cityworks.com/blog/keeping-park-clean-with-smart-technology/>)

Figure 18: A park director outlines an area of turf that needs maintenance using a smart phone app that reports to the Park GIS.

11.2. General Maintenance of Roads, Facilities and Grounds

Comparable community parks include generally are staffed by two maintenance personnel who are charged with mowing and maintaining and cleaning buildings and facilities. Major facility repairs and projects are bid out to a variety of professional contractors. The local highway department will generally volunteer its services for crucial maintenance and improvement projects.

A primary issue faced by municipalities is sustaining funding for facility upkeep. Costs included in maintaining facility upkeep typically include:

- Upkeep of three buildings including painting, replacing roofs, replacing rotting or damaged siding, etc;
- Maintaining sports fields and courts;
- Upkeep of swimming areas;
- General landscape maintenance including pruning trees, mowing grass, mulching beds, flower beds;
- Trails repair and maintenance;
- Winterization of facilities and utilities;
- Fencing maintenance and repairs;
- Access drive and parking surface repairs;
- Playground surface restoration.

As a nature park, three of the major area of maintenance cost will not be needed at Furnace Run Park as there will not be sports fields or courts to maintain, and it is unlikely a swimming facility will be built as the community has access to the pool at Veteran's Park. In addition, other than some of the facility maintenance, the work required does not require special training and can be carried out by volunteers, and recreation interns. There will be additional maintenance and monitoring as part of the park Forest Management Plan that would not be part of typical municipal park schedule of maintenance. Local educational institutions may be able to undertake these efforts with trained staff and students.

Maintenance efforts can be conducted following checklist that outline maintenance items and safety checks for various areas. The Township should assume that some items will require trained staff member to review, others can be completed by less skilled persons or volunteers. Many communities codify their maintenance and operations as local laws, an [example of a municipal park maintenance and operations plan](#) from the City of Roanoke, Virginia was developed as a local code.

Four key areas of maintenance requirements will be needed at Furnace Run, each with a unique set of typical kinds of task and safety checks.

- Park buildings, facilities, roads and utilities;
- Playgrounds, play areas, children's areas;

- Trails and pedestrian systems;
- Forest management and maintenance.

We have included several examples of checklists and safety checks in the appendices.

Event and programs held at the park will have specialized on-time pre-event preparation and post-event maintenance requirements. Much of the anticipated impact of the event should be taken into account in the usage fee, and much of the anticipated site maintenance after the event that can be anticipated can be either completed or paid for separately by event sponsors as part of a zero impact clause in the [usage permit](#).

11.3. Park regulations, safety and security

Security Considerations (CPTED) - Crime prevention through environmental design (CPTED) practices are intended to make it harder for perpetrators to commit crimes and to significantly increase the chances that they will be observed and thus brought to justice. Many recommendations discussed below are in conflict and therefore a balance will need to be struck between the need to control access versus surveillance needs; as well as access control and surveillance versus creating an interesting, inviting and attractive experience in the park and along Furnace Run's trails. Below is a list of specific security threats and how they can be mitigated. Many of the recommendations have already been incorporated into the recommendations sections above.

Safety Considerations

Accessibility- This includes compliance with ADA and other federal accessibility standards. This project will have some non-standard gradients in segments.

Pedestrian Safety Conflicts- This would apply where the trails parallels or crosses roads, or railroads. There will be some needs to ensure safety at the crossing around the gateway nature play area.

Trail User Conflicts – On some paths there is like to be differing needs for varying types of trail users may be in conflict. Conflicts are more likely on shared park roads.

Signage – a lack of adequate signage can cause confusion. The project should include trailhead mapping and information as well as mile markers and other advance warning along the route.

Design Consistency- It will be important to maintain consistency when there is a transition from the off-road to road-side in design and signage conventions to reinforce the trail route for users.

Security Concerns

Fear of Crime – Women are more likely to fear, dark areas increase the perception of risk and poor maintenance/graffiti increase the perception of risk. These factors should be considered in design and placement of safety enhancement measures.

Park and Trail Security Misconceptions – Crime rates on trails tend to be lower than the areas they serve.

Trailhead Security – Crimes are more likely to occur at trailheads than anywhere else on a trail. Lighting and other security enhancements should be concentrated in these areas. Facilities built to encourage visits and stays by police and other surveillance personnel will help address this concern.

Usage Rates - The greater the number of users, the greater the sense of security in the park and on trails.

Technology May Not be the Answer – Many park and trail systems have found expensive cameras, emergency phones, call boxes enhanced the sense of security but were generally never used, deteriorated quickly, attracted vandalism, and were expensive to operate. For Furnace Run Park use of cameras should be carefully considered and possibly phased in as the usage increases.

Maintenance Factors

Maintenance Deficiencies that affect Safety and Security – Parks and trails were more likely to be perceived as safe and secure when well maintained and graffiti and vandalism was quickly addressed.

Responsibility and Coordination – Lack of a clear agreement on maintenance and operation responsibilities among local agencies and volunteer organizations can result in deterioration and decreased usage, a decrease in safety and an increased lack of a sense of user security.

Snow Removal – Winter usage of the trail can cause damage and deterioration if not carefully considered in design. Winter usage by showshoers or cross country skiers could eliminate the need for snow removal. This should be discussed given the likelihood that students will be significant users which would warrant snow removal and winter trail considerations.

Pavement/Surfacing – Frequent complaints from users include wide cracks, holes, loose surfacing, large puddles, tree root damage and overgrown vegetation. These maintenance related issues can be addressed more quickly with an easy reporting method such as a crowd-sourcing app and a clear understanding of who should complete repairs.

Natural Access Control Measures

Natural access control measures include the use of plants, rock, steep slopes and other natural barriers to control access. Natural measures are generally low initial cost, low maintenance and have very long lifespans and thus are preferred to other measures.

Plantings - Hedges and other dense forms to funnel users to desired access points; screen views and prevent access. These plants are fast growing natives and when installed in close groupings tend to form dense branching structures that significantly discourage access. Dense and armored plants to discourage trespass and access to dangerous areas. These plants have a lower habit of growth and may not provide dense screening but are very effective access deterrents having thorns, sharp needles, sharp foliage or spiked branches.

Steep slopes (greater than 25%) covered in dense vegetation or rock fill are another access control technique, though not as effective as vegetative screens. Steep slopes can also include creation of earthen berms to control vehicular access and direct bicyclists. Slopes are protected by cover with geo-web products, geo-technical matting, rock, deep mulch and dense vegetation including grasses.

Natural rock can be used to restrict vehicular access, identify entranceways, define pathways, and generally control access.

Territorial Reinforcement Measures

Directional and Warning Signage at the trail heads should inform and orient users with directions, information, trail mapping, and rules of use. The Roaring Brook Road trail head will include parking and occupy a larger space presenting the opportunity to create a more elaborate facility. Along the trail private property should be marked, railroad property boundaries and structure locations along the county sewer easement. Mile markers and advance warning signs along the trail should also be considered as they enhance the trail user sense of control.

Interpretive Signage and Site Markers along the trail can also provide territorial reinforcement encouraging trail use. Interpretive signs can provide locational and access or egress information for trails users.

Gateway treatments at the trail heads should clearly identify trail entrances, as well as public and private areas. The Roaring Brook Road trail head will likely have more extensive user amenities the trail entrance near Chestnut Oaks can be primarily marked by signage.

Fencing— along railroad, private property, guiderails along slopes, wetlands, high boardwalks, bridges. Use chain link and other transparent fencing to control access while still allowing for surveillance.

Surveillance Measures

Increase visibility – The primary objective here is eliminating hiding places and providing for surveillance.

- Design, whenever possible for long sight lines. For this project there are segments where this may not be feasible such as near the tennis courts at Chestnut Oaks. Other surveillance measures including a larger clear zone and lighting will be needed to enhance surveillance in those areas.

- Clear all dense shrub growth and prune and remove low tree branches within an envelope of space 12' high and 10' wide from the edge of trail pavements. Bicycle racks, signage, call boxes, benches and exercise equipment should be provided an additional 10' clear zone. These amenities can be strategically placed along the trail to enhance sight lines.
- Provide 12-15' height LED lighting for areas of concern, especially at the trailheads, bridges, along roadways, problem prone spots and areas where hiding places may not be easily removed. Motion sensitive lighting can reduce electrical costs.

Coordinate with police and emergency personnel to assist with trail surveillance. Provide amenities such as restroom facilities, benches, picnic tables, wifi and dedicated parking spaces to encourage surveillance by Police at the trailheads and trail entry points.

Maintenance Considerations

A well maintained park that is care for is a threat to criminals they will likely avoid. Quick repair of damage such as graffiti is the key element in making the park and trails more secure. 'Friends of ...' groups can be extremely valuable as they are typically trail users and may be able to assist with surveillance. By organizing volunteers for spring and fall cleanups, inspecting the trail after storm events, and reporting damage, graffiti and incidents on the trail they provide a valuable communication of maintenance needs to those responsible for repairs. Friends of groups can take on specific targeted projects such as quick responses to graffiti. Other considerations include:

Vandalism resistant materials should be used for any large surfaces that can be painted. If a graffiti resistant surface is not possible, graffiti-proof coatings/paints are available for stone, wood and metal surfaces that make cleanup of graffiti much less labor intensive. Fencing, boardwalks, bridges, signage and other large surfaces would be susceptible; therefore lighting should be located to increase surveillance of those areas.

Keeping a well maintained trail requires more than just one entity. For this project maintenance could involve the Township, County, and a Friends Of group all playing different roles. Responsibilities should be formally established in a memorandum that describes the type and

frequency of maintenance

activities each organization will carry out. Friends of can play a major role in reporting needs, leading seasonal cleanup efforts, and in rapid response repairs to vandalism. Communication between the groups will be an important way to ensure timely repairs can be made and that regular maintenance is completed. Use of a webpage and use of crowd sourcing apps could aid in reporting and providing accurate information including location and extent of needed repairs.

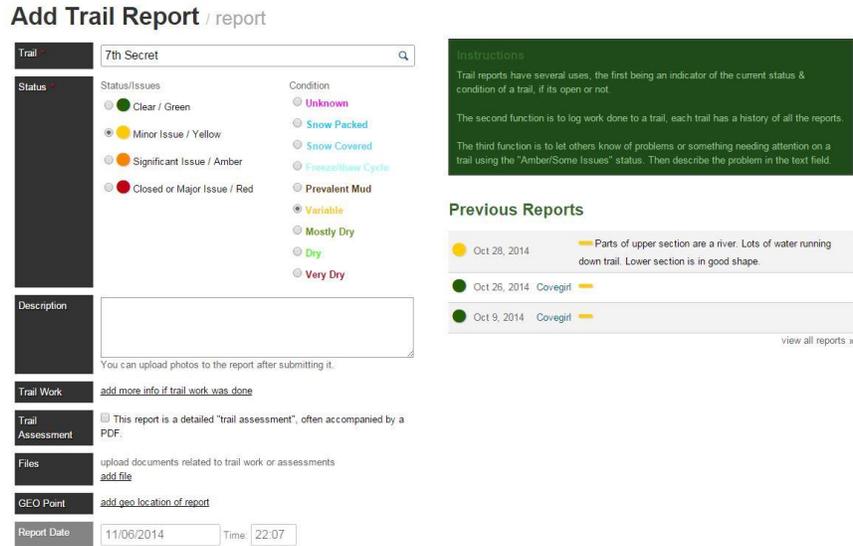


Figure 19: Smart phone apps allow park trail users to provide geo-coded reports on issues directly to the Township.

Provide lighting, cameras where problems exist or threats are presumed in a phased approach. This will require some coordination amongst the interested parties including the Town, MNR, Westchester County and the School District. During detailed design, a CPTED workshop can establish critical areas that should be lighted or have cameras. Services to the lights and cameras should be expandable to allow for future placement of additional lights or cameras as the need arises. Newer camera technology involves the use of motion sensors that can also send out an alert to monitors. These are smaller units are resistant to vandals because they have small camouflaged housing that is difficult to see. In addition to monitoring in real time they record the activity on site on a memory card. Most trail professionals have found call boxes to be a bad investment. Call boxes were reportedly rarely used, vandalism targets, and costly to maintain.

11.4. Annual Operation and Maintenance Cost

As a nature park, Furnace Run Park will not include sports fields, paved athletic courts or a formal public swimming facility therefore maintenance costs will likely be in the lower end of typical O&M costs for local parks. While there will be some facility maintenance, the majority of upkeep required does not require special training and can be carried out by volunteers, and recreation interns. There will be additional maintenance and monitoring as part of the Park’s Forest Management Plan that would not be part of typical municipal park schedule of maintenance. As mentioned earlier, local educational

institutions have indicated they would be able to undertake seasonal cleanup or maintenance efforts with trained staff and students.

Phase by Phase Probable Cost of O&M:

Phase 1 (2021):

Phase 2 (2022):

Phase 3 (2023):

12.0 PARTNERSHIP OPPORTUNITIES

12.1. Non-Profit Organizations

[South Mountain Partnership](#) – The Partnership’s website states: *‘The South Mountain Partnership is a regional, landscape-scale conservation project in south-central Pennsylvania. This Partnership has emerged to guide efforts within the South Mountain Conservation Landscape, one of seven Conservation Landscapes that the Pennsylvania Department of Conservation and Natural Resources (DCNR) has identified throughout the state.’*

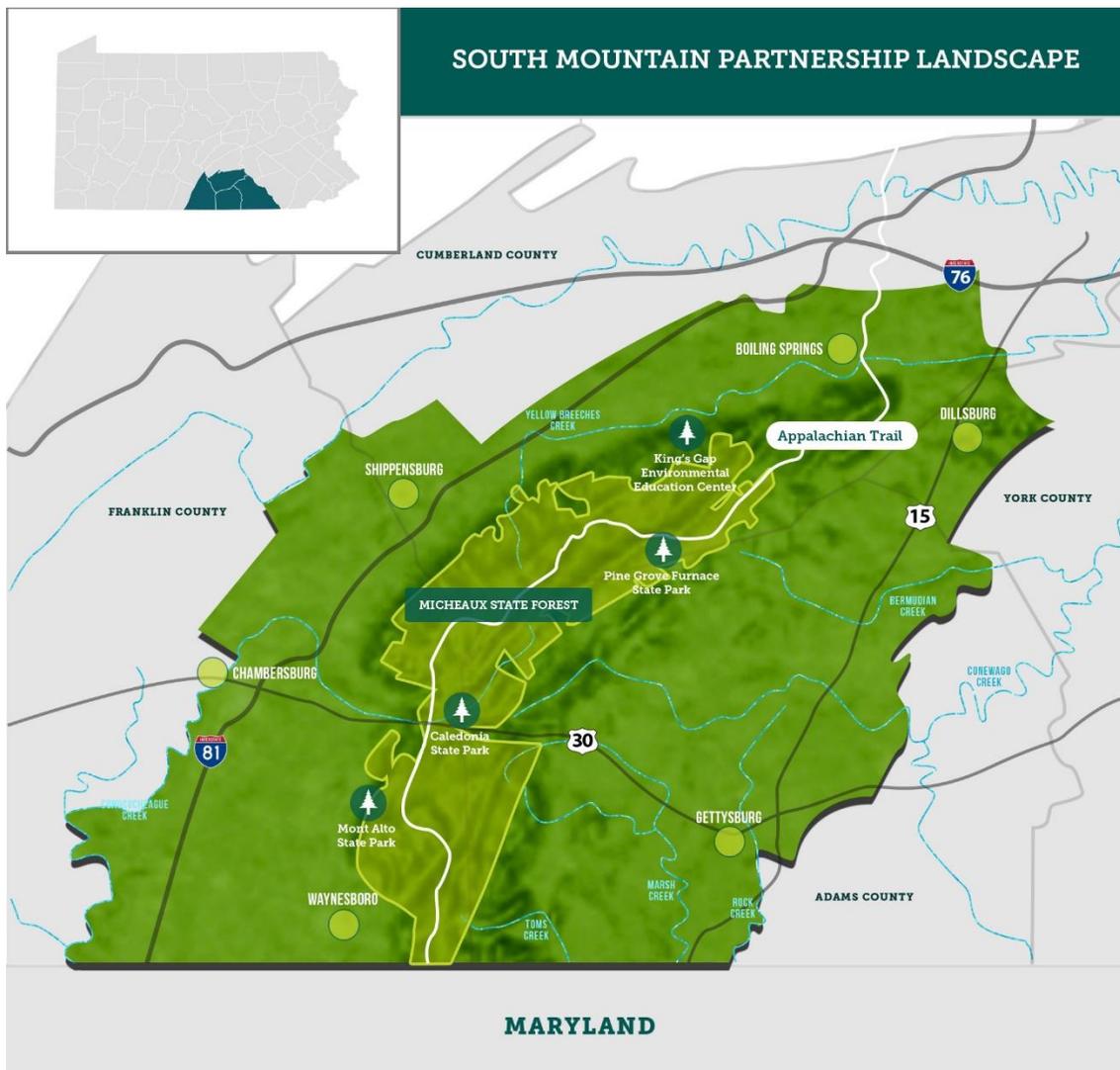


Figure 20: South Mountain Partnership Service Area

The Partnership sponsors speakers, workshops and various efforts toward conservation in their service area. Of interest as it relates to Furnace Run Park, they sponsor and Research Corp and Science Summit amongst the local colleges. This event would be a great opportunity to seek out partnerships for study

at Furnace Run Park. The Partnership also provides small grants (up to \$15,000) which would be helpful in funding some of the follow up studies needed at the Park.

[The Appalachian Trail Conservancy's](#) mission is to protect, manage, and advocate for the Appalachian National Scenic Trail. The group organizes events, volunteer efforts and other conservation efforts along the entire trail. The ATC could provide valuable input into how Furnace Run Park would fit into the system of the Appalachian Trail.

[Cumberland Valley Rail Trail](#) /Cumberland Valley Rails to Trails Council states that it is an *'all-volunteer, non-profit, charitable corporation dedicated to conservation, historic preservation, recreation and alternative transportation in the Cumberland Valley of Pennsylvania through the development of multi-use trails along former railroad corridors and other areas.'* The CVRTC has established a trailhead in Shippensburg where a new Conrail Museum is planned, and has completed a feasibility study for expansion of the CVRT into Southampton that could in the future be a key connection to Furnace Run Park. The CVRTC could be a powerful ally in lobbying for support of off-road trail connections to the park, providing support for trails at the park and a potential source of shared volunteer labor. There could be some mutual gains to be made to the benefit of the CVRTC and Friends of Furnace Run to a strong alliance.

The [Central Pennsylvania Conservancy](#) is a local land trust that focuses their efforts around South Mountain and the Cumberland Valley. Their webpage states, *'Since 1982, CPC has protected over 7,000 acres of land through fee acquisition, conservation easements, and transfer projects. With 5 preserves and 30 conservation easements, we not only protect critical natural areas, but we also steward those resources under our care.'* The CPC is a member of the national Land Trust Alliance which provides grants for land acquisitions and conservation easement purchases. CPC could be an important partnering organization in the acquisition of parcels adjacent to Furnace Run Park.

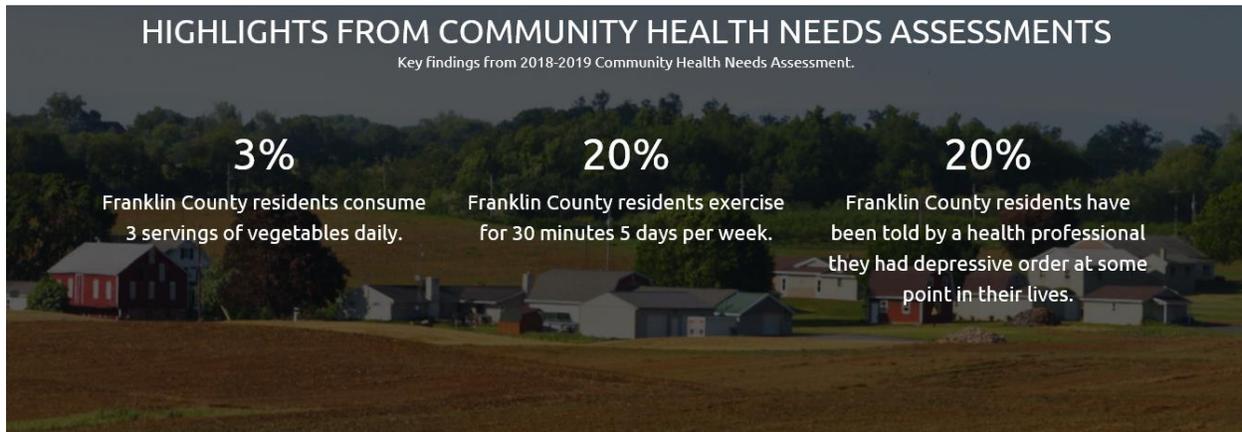
The [Pennsylvania Environmental Council](#) is a statewide organization focused on environmental. Their mission states, *'The Pennsylvania Environmental Council (PEC) protects and restores the natural and built environments through innovation, collaboration, education and advocacy. PEC believes in the value of partnerships with the private sector, government, communities and individuals to improve the quality of life for all Pennsylvanians.protection and restoration'*. The PEC's potential role in Furnace Run Park is related to their statement, *'With a statewide perspective, PEC facilitates regional partnerships of local governments, agencies, and allied non-profits to envision, plan, and implement trail systems and projects. Our years of experience in professional insight into project planning, design, and development accelerates projects from mere concept to reality.'* PEC also offers small grants for land and water trail projects, however none of the current offerings apply to Furnace Run Park.

[WeConservePA](#) reports that it is a group of conservation volunteers, professionals and supporters united around common interests and needs. The group states that it, *'helps people protect, wisely use, and enjoy what nature offers. We advocate for pro-conservation, life-sustaining governmental policy and*

assist individuals and organizations in effectively and efficiently conserving land, advancing sustainable practices, and connecting people to the outdoors.’ Among the most valuable contributions this group can make is the amazing collection of document templates and guides available in their TOOLS area. Many of these [TOOLS](#) are provided by links elsewhere in this master plan document. The group actively supports municipal Environmental Advisory Councils through their EAC Network.

12.2. Local Governments

Franklin County - Franklin County is likely to gain from Southampton’s development of Furnace Run Park. The [Explore Franklin County](#) website is heavily focused on the recreational opportunities presented in the backdrop of the South Mountain Landscape, as well as the potential for drawing visitors to the Appalachian Trail. With the uniqueness of a nature park, the on-site trail system and views offered by Furnace Run as well as potential connections to the Appalachian Trail, Furnace Run Park will significantly increase the offerings for recreation in Franklin County. [Healthy Franklin County](#) is a separate organization focused on improving county-wide health through activity, focused on recreation. The County recently completed a needs assessment which concluded only 20% of residents exercised for 30 minutes five days per week and that 20% of county residents had been diagnosed with a depressive disorder at some point in their life. Furnace Run Park will provide a healing space and a convenient location for needed exercise in the beautiful setting of the South Mountain Landscape.



Healthy Franklin County also provides assistance through the [Foundation for Enhancing Communities](#) for a variety of health improvement projects and would be a strong partner for Southampton in both the development of park facilities and in the creation of community health focused programming at Furnace Run Park.

[Shippensburg Borough](#) – The Township and the Borough have strong links in a number of ways including sharing a Parks and Recreation Authority as well as a municipal water supply. There is an obvious synergy between what Southampton will offer at Furnace Run Park and the niche of recreation needs it will fill for the Township and Borough residents as well. Several events including the Shippensburg Fair, the Corn Festival and other large events could be partially supported at Furnace Run Park. Shippensburg

will have a vested interest in protection of their shared water supply in the preservation of the large section of the watershed occupied by Furnace Run Park and would be expected to support further studies of the park's water resources. Shippensburg's police, fire and public works departments may be called upon to help the Township at Furnace Run.

[Southampton Township Cumberland County](#) – The Township's northern half in Cumberland County and separate municipality has large residential areas in close proximity to Furnace Run Park. Southampton CC also has facilities for rental that are similar to anticipated facilities at Furnace Run. It would benefit both municipalities to coordinate their offerings so that the facilities at Furnace Run fill needs not met by the Southampton CC facilities. Other coordination would be mutually beneficial including alternative routes to connect the Cumberland Valley Rail Trail to Furnace Run Park.

12.3. Educational institutions

[Shippensburg State University](#) - The Center for Land Use and Sustainability (CLUS) at Shippensburg State was established to foster healthy, vibrant, and sustainable communities through applied research, experiential learning opportunities, and interdisciplinary, cross-sector partnerships. The CLUS webpage states, 'Leveraging a team of interdisciplinary scientists, the CLUS aims to promote sustainable land use, economic development, cultural and natural resource management, and multi-scale community support. As an academic institution, the CLUS is also able to provide valuable professional opportunities for student work and research. Our Affiliate Scholars and Student Fellows conduct research and complete projects in the community.

[The CLUS](#) is just one potential connection of many to the University that can partner with Southampton in development of the Park. Fall and spring incoming classes complete community service projects and could complete volunteer projects. Other faculty members have offered to assist with studies of water resources and cultural resources.

[University of Penn State Mont Alto](#) offers several programs related to conservation, public health and forestry science that could offer opportunities for practical research at Forest Run Park. Mont Alto students may also provide a valuable volunteer workforce for park construction, maintenance and special events.

[Wilson College](#) – Located in nearby Chambersburg, Wilson College is only 13 miles from the park and offers programs in education, environmental studies and sciences that might benefit from opportunities to offer programs at Furnace Run Park. Education program student interns may play a role in summer youth programs or other education-based activities in the park. Similar to other colleges, Wilson student might also provide a valuable volunteer workforce for park construction, maintenance and special events.

12.4. Corporations, Private Enterprise

Local Landscape Suppliers

12.5. Habitat monitoring and conservation groups

12.6. Local Volunteer Organizations

APPENDICES

APPENDIX A

The experience to
listen
The power to
solveSM

Barton
&Loguidice

www.bartonandloguidice.com