



PennState

Stone Valley Recreation Area Feasibility Study

Penn State Project Number 000623700

June 30, 2020



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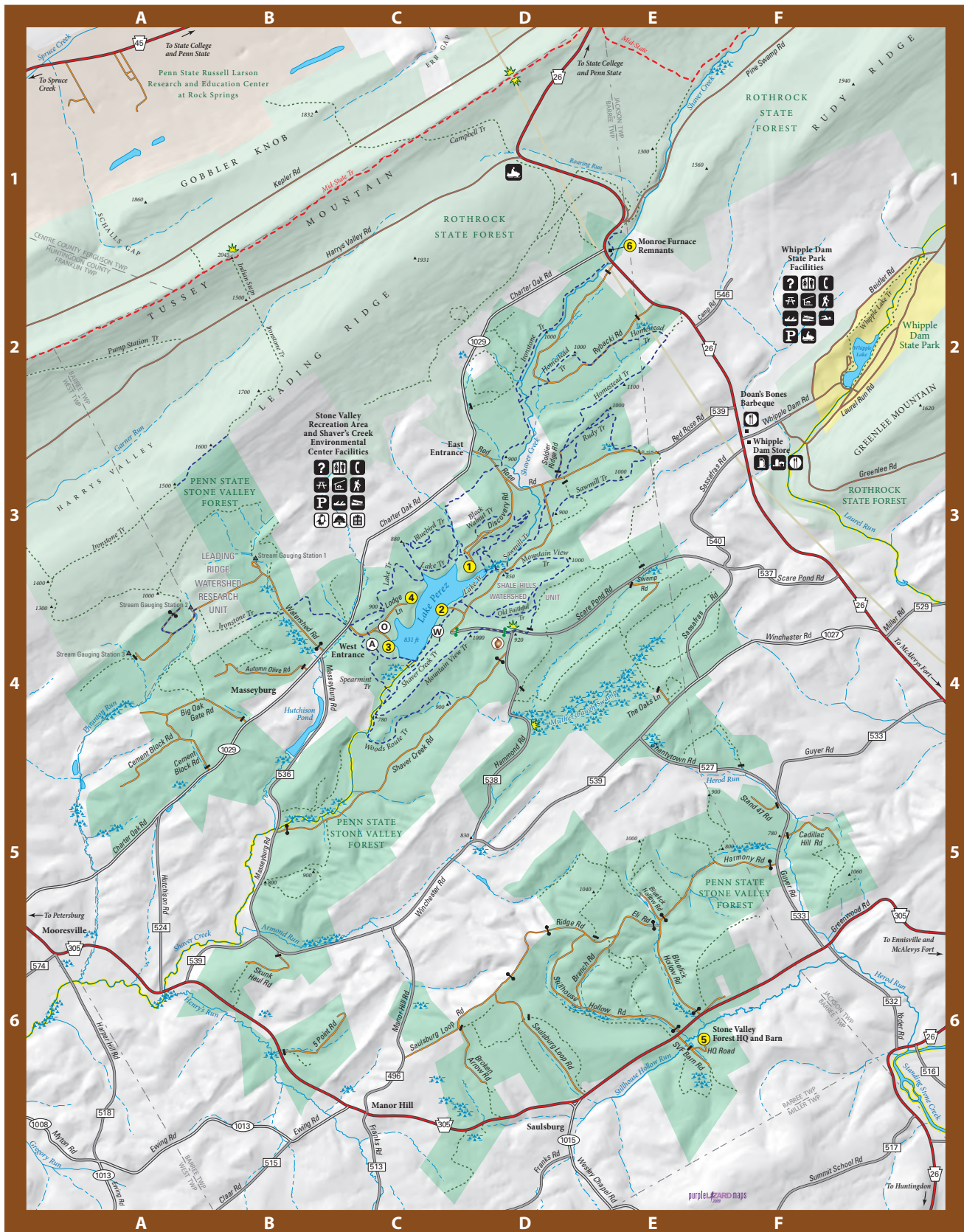
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- Appendix B: Lake Perez Water Analysis
- Appendix C: PA Department of Environmental Protection NPDES Meeting Minutes
- Appendix D: PA Department of Environmental Protection Wastewater Meeting Minutes
- Appendix E: Mechanical, Electrical, and Plumbing Analysis Report - Reese Hackman
- Appendix F: Wastewater Analysis Report - Biohabitats
- Appendix G: Groundwater Analysis Report - Casselberry and Associates





Penn State Stone Valley Forest

- Penn State Stone Valley Forest
- Penn State Russell Larson Research and Education Center at Rock Springs
- DCNR Rothrock State Forest
- DCNR State Park
- Private Land



- 1 Shaver's Creek Environmental Center
- 2 Stone Valley Recreation Area, Office and Rental Cabins
- 3 Boat House
- 4 Civil Engineering Lodge
- 5 Stone Valley Forest HQ and Barn
- 6 Monroe Furnace Remnants
- W Vertical Adventure Carolina T-Wall
- V Vertical Adventure Odyssey III Course
- A Vertical Adventure Alpine Tower and Swing
- X Xi Sigma Pi Chestnut Demonstration Orchard
- ~ Wetland
- ▲ Vista
- ▲ 1208 Elevation (feet)

- ? Information
- ☎ Telephone
- 🚻 Restroom
- 🍷 Picnic Area
- 🏠 Picnic Pavilion
- ⛽ Gasoline
- 🛒 Groceries
- 🍽 Food Concession
- P Parking

- Hiking Trails
- Swimming Beach
- Boat Launch
- Boat Ramp
- Picnic Pavilion
- Gasoline
- Groceries
- Food Concession
- Parking

- State Highway
- State Road
- Township Road
- Penn State Road (No winter maintenance)
- DCNR/Bureau of Forestry Road
- Power Line Right of Way
- Mid-State Hiking Trail
- Stone Valley Recreation Area Hiking Trail
- Trail
- Stream
- Intermittent Stream
- Pennsylvania Fish and Boat Commission Approved Trout Stream
- Penn State Permanently Closed Gate
- Penn State Seasonally Closed Gate
- Barree Township Seasonally Closed Gate

Executive Summary

The Pennsylvania University desires to enhance the Stone Valley Recreation Area to provide students, faculty and staff with opportunities to focus on and improve upon all aspects of their wellbeing while continuing to provide recreational opportunities for the general public.

During this planning process the vision and goals for the Stone Valley Recreation Area were defined.

Stone Valley Recreation Area Vision Statement

The Stone Valley Recreation Area will serve and engage students and the campus community while continuing to provide amenities for the public. Facilities and programming will revolve around a holistic wellbeing center, vertical adventure area, outdoor recreation area, and a leadership retreat center while complementing environmental education, research, and forestry management activities. The Stone Valley Recreation Area will incorporate sustainable principles through design, operations, and fiscal management.

Goals

The goals for the Stone Valley Recreation Area are to:

- Promote and reinforce Penn State's commitment to leadership development and holistic wellbeing in a natural environment.
- Implement a shared focus to attract more visitors, increase programming demand and opportunities, generate increased revenue, attract funding and donor interest, and establish Stone Valley as a preeminent leadership and holistic wellbeing center.
- Leverage resources & coordinate approach with partners. Facilities should be complementary, not duplicated.
- Provide consistent architectural and landscape aesthetic, coordinated signage, lighting, wall & paving systems, building materials, paint colors, native plantings, maintenance practices, etc.
- Aspire to be sustainable in all aspects.

This effort is focused on evaluating the feasibility of improving three of the four existing use areas in the Stone Valley Recreation Area. These include:

1. Outdoor Recreation Area (historically known as the Mineral Industries Camp);
2. Vertical Adventure Area, and;
3. Civil Engineering Lodge Area.

The Shaver's Creek Environmental Center, which is also part of the Stone Valley Recreation Area, underwent a two-year expansion project which opened to the public in the fall of 2019. Therefore, it was not included in this study.

Analysis of Existing Conditions

An analysis of the existing conditions of the Stone Valley Recreation Area was completed to develop an understanding of the site, its context, and the resulting constraints and opportunities for development.

The design team met with staff from Campus Recreation, Counseling and Psychological Services, and the Office of the Physical Plant to develop the site and building program. The purpose of establishing the program was to determine current and future site and building requirements and determine current and future user requirements. With this information, conceptual plans were prepared for the proposed site and building improvements.

Concept Development

Taking the site opportunities and constraints into consideration, two concept alternatives were developed for each site to show the variety of ways the site and building program could be accommodated in each area. These alternatives were evaluated by the University. One alternative was selected for each area to be further developed into the final concept plan for each of the areas.

The final concept plans for the Stone Valley Recreation Area are the result of analysis of the existing site, active University participation, and numerous in-depth discussions regarding the needs of the University and visitors to Stone Valley Recreation Area.

An important component to the analysis, evaluation, and ultimately to the development of the final concepts was the analysis of utility services at each of the areas. The only public utility currently available to each site is single phase electric service. Therefore, analyses were prepared to address potable water, fire suppression, and wastewater needs given the programs for each site. As a result several key decisions were made during these analyses:

1. The Stone Valley Recreation Area is located in the Shavers Creek watershed which is designated a PA DEP Chapter 93 Water Quality Standards as a High Quality -Cold Water Fishery (HQ-CWF). The forest research areas to the south drain to Standing Stone Creek, which is also defined as a Chapter 93 HQ-CWF. As such water quality standards when developing or improving the property are held to a higher standard. These standards include establishing and maintaining a one hundred and fifty foot riparian forest buffer to mitigate water quality effects of development. Earth disturbance permitting requirements are more rigorous given the HQ-CWF designation.
2. During the wastewater analysis a certified soil scientist performed testing to determine the suitability of available soils for receiving wastewater from the project sub-areas. Both the Leadership Retreat Center and Recreation Area, the two portions of the site with the highest wastewater flows, were found to have limited availability of suitable area for drainfields, while the Wellbeing Center and Vertical Adventure Areas had suitable soil to accept more than the projected flows from those sites.

The wastewater design flow of each area was compared alongside the disposal field capacity. All areas except for the Leadership Retreat Center had enough soil capacity for a primary drainfield. In order to meet the soil capacity at the Leadership Retreat Center, a flow equalization strategy is recommended. Due to the shallow limiting layers discovered in the soil throughout the site, secondary wastewater treatment is required.

The wastewater treatment strategy at the Wellbeing Center, Vertical Adventure Area and Recreation Area is a septic tank for primary treatment, a textile filter for secondary treatment, followed by drip disposal. The wastewater recommendation for the Leadership Retreat Center has a slightly different strategy and involves a more involved treatment train. Septic tanks are recommended for primary treatment followed by flow equalization. Horizontal subsurface flow wetlands, complimented by trickling filters, are recommended for secondary treatment and nitrogen reduction because the Leadership Retreat Center will be required to do a plume analysis due to its higher flow rate. Both the Wellbeing Center and the Leadership Retreat Center will also have grease traps because food preparation will occur at those sites.

The overall intent for wastewater treatment is to provide easy to operate, cost effective, low energy, consistently proven technologies. The disposal strategies were dictated by the soil conditions found on site. In one location, the limited availability of suitable soils indicated the need for an equalization of wastewater flows. Ultimately, the strategies recommended are proven, effective approaches that are appropriately conservative to limit risk.

3. The University directed the design team to design the electrical systems around a single-phase service from Valley Rural Electric Cooperative as three phase power is not currently available at the site. The major electrical loads that would typically utilize three phase power will be handled with alternative strategies. These loads include fire pumps, domestic water booster pumps, elevators and mechanical systems. The electrical service will be run overhead along the connecting roadways and drop underground at each of the four areas. The University directed the design team to include the provision of installing fiber optic cable and conduit in the project budget.
4. The University provided direction on structures that require fire protection systems. The design team recommends two fire suppression systems. The first being a sprinkler system for the buildings, and the second being a dry hydrant system utilizing the lake as the water reservoir to meet the site hydrant requirements. The building sprinkler fire protection system will be handled by pumphouse buildings located in each of the following areas; the Recreation Area, Leadership Retreat Center Area and the Wellbeing Center Area. No building sprinkler fire protection system was required for the structures in the Vertical Adventure Area. The fire pumps will be diesel fire pumps due to the proposed single-phase electrical service. Either below ground or above ground tanks will store water for the fire protection system and not the hydrant system.
5. With respect to the site hydrant fire suppression, the University provided direction to utilize a dry hydrant system using lake water as the water supply in lieu of the large storage structures that would be required to provide sufficient storage capacity for a hydrant system. The system would be charged by the local fire department when they connect to it. This system will require discussion with the local fire department during the formal project design process.
6. The design team suggested that geothermal heat pump systems would be a viable option for the buildings requiring both heating and cooling. In addition to energy efficiency, the geothermal system was proposed because of the limited site mechanical equipment required. The visual and acoustic benefits for this environment made this a good solution. This was discussed with the University but a final decision will not be made until the next phase of design. This study and the associated cost estimates reflect geothermal systems. A final system will be selected during the formal project design.
7. Early in the project, emphasis was placed on providing sustainable transportation choices for those who visit Stone Valley. Campus Recreation staff initiated discussions with Penn State Transportation Services related to desire and need for van, buses, or ride sharing services to Stone Valley. Parking needs should be based on the anticipated programming needs of the facilities, rather than on the assumption that all facility and activity areas are operating at peak capacity at the same time.
8. The University indicated it is their desire to aspire to design to and potentially obtain one or more sustainability certifications for the facilities being proposed in the Stone Valley Recreation Area. In addition to meeting the University's standard for LEED certification, Campus Recreation expressed their interest in achieving WELL Building certification for the Wellbeing Center.

This feasibility study provides a foundation to guide the decision-making process to improve the Stone Valley Recreation Area to become a preeminent center for holistic wellbeing. The final concept plans reflect the vision and goals developed by the project's stakeholders to guide the future of Stone Valley Recreation Area. This includes an overall site concept plan showing the relationship of each area to one another and detailed concept plans for each of the following areas:

- the Recreation Area,
- the Leadership Retreat Center,
- the Vertical Adventure Area,
- and, the Wellbeing Center.

The Recreation Area provides a single location that allows for numerous outdoor recreation activities including: fishing, swimming, kayaking, paddle boarding, picnics, volleyball, outdoor gatherings and performances. The Leadership Retreat Center provides opportunity for leadership development, retreats, conferences and gatherings, along with the ability to accommodate guests overnight. This area provides larger venues and overnight accommodations to extend programming to larger groups over multiple days. The Vertical Adventure Area provides opportunities for unique climbing and team building recreation activities. The Wellbeing Center provides a relaxing space for students, faculty and University staff to focus on and improve their overall wellbeing, beyond physical health.

Together these four sites and the existing Shaver's Creek Environmental Center provide a cohesive and multi-functional recreation campus for a variety of users.

On the following pages are the concept plans for each area, along with character images which represent the type of aesthetic, facility, and activity areas being proposed.





Stone Valley Recreation Area Study

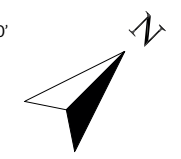
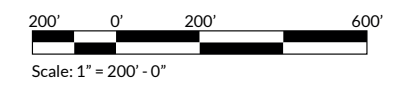
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Overall Site Concept Plan



- 1 Recreation Area
- 2 Leadership Retreat Center
- 3 Vertical Adventure Area
- 4 Wellbeing Center
- 5 Lake Loop Trail

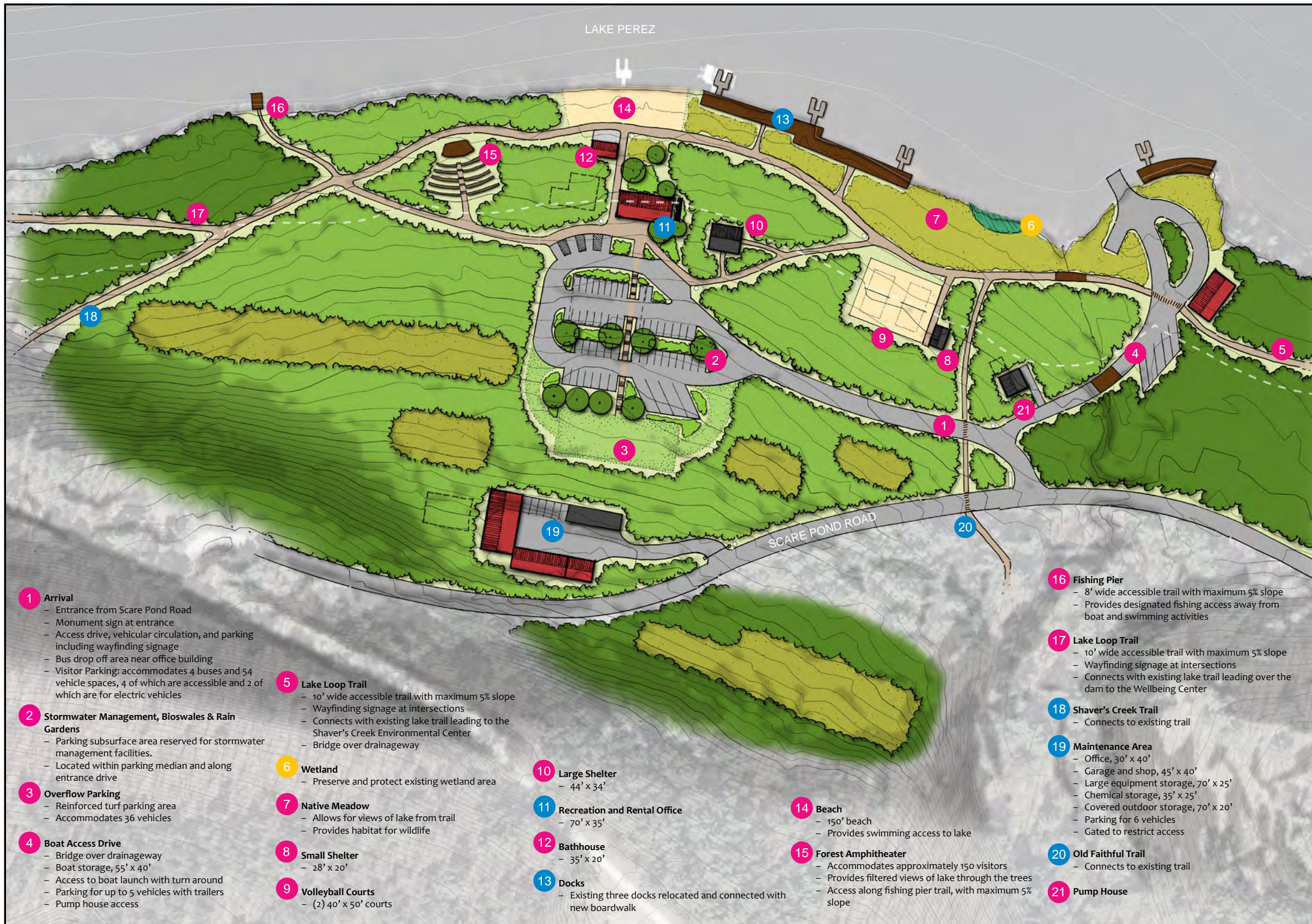
-  Proposed Understory Restoration Area
-  Existing Forested Area
-  Proposed Reforestation Area
-  PA DEP Riparian Forest Buffer Setback







Stone Valley Recreation Area Study

Penn State Project No. 00-06237.00

Recreation Area Concept Plan



-  Proposed Understory Restoration Area
-  Existing Forested Area
-  Proposed Reforestation Area
-  PA DEP Riparian Forest Buffer Setback

- 1 Arrival**
 - Entrance from Scare Pond Road
 - Monument sign at entrance
 - Access drive, vehicular circulation, and parking including wayfinding signage
 - Bus drop off area near office building
 - Visitor Parking: accommodates 4 buses and 54 vehicle spaces, 4 of which are accessible and 2 of which are for electric vehicles
- 2 Stormwater Management, Bioswales & Rain Gardens**
 - Parking subsurface area reserved for stormwater management facilities.
 - Located within parking median and along entrance drive
- 3 Overflow Parking**
 - Reinforced turf parking area
 - Accommodates 36 vehicles
- 4 Boat Access Drive**
 - Bridge over drainageway
 - Boat storage, 55' x 40'
 - Access to boat launch with turn around
 - Parking for up to 5 vehicles with trailers
 - Pump house access

- 5 Lake Loop Trail**
 - 10' wide accessible trail with maximum 5% slope
 - Wayfinding signage at intersections
 - Connects with existing lake trail leading to the Shaver's Creek Environmental Center
 - Bridge over drainageway
- 6 Wetland**
 - Preserve and protect existing wetland area
- 7 Native Meadow**
 - Allows for views of lake from trail
 - Provides habitat for wildlife
- 8 Small Shelter**
 - 28' x 20'
- 9 Volleyball Courts**
 - (2) 40' x 50' courts

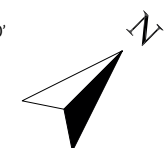
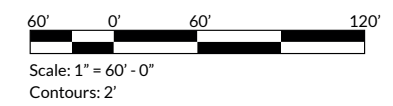
- 10 Large Shelter**
 - 44' x 34'
- 11 Recreation and Rental Office**
 - 70' x 35'
- 12 Bathhouse**
 - 35' x 20'
- 13 Docks**
 - Existing three docks relocated and connected with new boardwalk

- 14 Beach**
 - 150' beach
 - Provides swimming access to lake
- 15 Forest Amphitheater**
 - Accommodates approximately 150 visitors
 - Provides filtered views of lake through the trees
 - Access along fishing pier trail, with maximum 5% slope

- 16 Fishing Pier**
 - 8' wide accessible trail with maximum 5% slope
 - Provides designated fishing access away from boat and swimming activities
- 17 Lake Loop Trail**
 - 10' wide accessible trail with maximum 5% slope
 - Wayfinding signage at intersections
 - Connects with existing lake trail leading over the dam to the Wellbeing Center
- 18 Shaver's Creek Trail**
 - Connects to existing trail
- 19 Maintenance Area**
 - Office, 30' x 40'
 - Garage and shop, 45' x 40'
 - Large equipment storage, 70' x 25'
 - Chemical storage, 35' x 25'
 - Covered outdoor storage, 70' x 20'
 - Parking for 6 vehicles
 - Gated to restrict access
- 20 Old Faithful Trail**
 - Connects to existing trail
- 21 Pump House**

Improvement Actions

-  New
-  Improve
-  Relocate
-  Maintain



Stone Valley Recreation Area Study

Penn State Project No. 00-06237.00

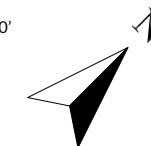
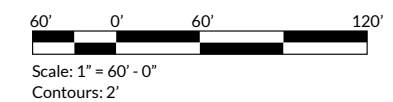
Leadership Retreat Center Concept Plan



- Proposed Understory Restoration Area
- Existing Forested Area
- Proposed Reforestation Area
- PA DEP Riparian Forest Buffer Setback

Improvement Actions

- New
- Improve
- Relocate
- Maintain



Stone Valley Recreation Area Study

Penn State Project No. 00-06237.00

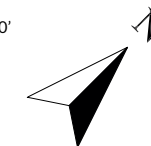
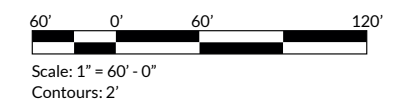
Vertical Adventure Area Concept Plan



- Proposed Understory Restoration Area
- Existing Forested Area
- Proposed Reforestation Area
- PA DEP Riparian Forest Buffer Setback

Improvement Actions

- New
- Improve
- Relocate
- Maintain







Stone Valley Recreation Area Study

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Wellbeing Center Concept Plan

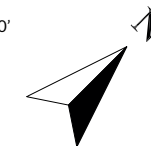
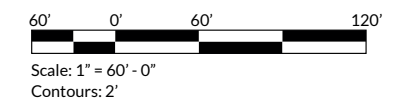


- 1 Arrival**
 - Gated entrance along Lodge Lane, welcome center in Lodge Lane island
 - New monument sign at entrance
 - Access road for vehicular circulation and parking
 - Bus drop off near building entrance
 - Visitor Parking: accommodates 13 vehicle spaces, 2 of which are accessible and 2 of which are for electric vehicles
 - Buses park at Vertical Adventure Area
 - Outdoor/Environmental art installations along front walkways
 - Pump house access
- 2 Spearmint Trail**
 - Relocate existing trail route to accommodate new entry drive and parking area
- 3 Maintenance Road**
 - Access road connects to existing road that leads to dam
 - Gated to restrict access
- 4 Stormwater Management, Bioswales & Rain Gardens**
 - Parking subsurface area reserved for stormwater management facilities.
 - Located within parking median and along entrance drive
- 5 Wellbeing Center**
 - Flexible gathering spaces, studios, and a kitchen
 - Utility area on south side of building
- 6 Wellbeing Center Patio**
 - Central fire ring feature
- 7 Yoga Lawn**
 - Lawn space accommodates yoga class with up to 20 participants
 - Perimeter walkway
 - Water feature along east edge of perimeter walk
 - Sculpture at apex of perimeter walk
 - Walkway provides access to the wellbeing trail
- 8 Wellbeing Trail**
 - 5' wide accessible trail with maximum 5% slope
 - Wellbeing Nodes (top to bottom): Social, Career/Academic, Physical (covered), Intellectual, Emotional/Spiritual (covered)
 - Includes wayfinding signage at intersections
- 9 Wellbeing Loop**
 - 5' wide accessible trail with maximum 5% slope
- 10 Lake Loop Trail**
 - 10' wide accessible trail with maximum 5% slope
 - Wayfinding signage at intersections
 - Connects to existing lake trail, 20% slope, that leads over the dam to the Recreation Area
- 11 Meditation Labyrinth**
 - Stone or wooden rings
 - 28' in diameter
- 12 Treehouse Overlook**
 - Spiral ramp to provide access, slope on ramp not to exceed 5%
 - Raised 12' above highest grade
 - 20' in diameter
- 13 Lake Loop Trail**
 - 8' wide accessible trail with maximum 5% slope
 - Wayfinding signage at intersections
 - Connects to Vertical Adventure Area
- 14 Pump House**

-  Proposed Understory Restoration Area
-  Existing Forested Area
-  Proposed Reforestation Area
-  PA DEP Riparian Forest Buffer Setback

Improvement Actions

-  New
-  Improve
-  Relocate
-  Maintain



Character Images



Sand Volleyball



Swimming and Beach Activities



Kayaking and Fishing



Paddle Board Yoga



Amphitheater



Picnicking



Stand Up Paddle Boarding



Welcome Center



Performances



Fire Ring



Gathering and Social Spaces

Character Images



Meditation Spaces



Treehouse



Art



Yoga Lawn



Yoga Patio



Canopy Walk

Character Images



Reinforced Turf Overflow Parking



Gathering Spaces



Rain Gardens



Native Meadows



Native Meadows



Riparian Buffers

Character Images



Vertical Adventure



Vertical Adventure



Vertical Adventure



Team Building

Character Images



Shaver's Creek Environmental Center - Kimmel Bogrette



Camp Greenkill, New York - H-H Architects



Camp Seymour, Washington - BCRA Architects



Shaver's Creek Environmental Center - Kimmel Bogrette



Shaver's Creek Environmental Center - Kimmel Bogrette



Pleasant Ridge Camp and Retreat, South Carolina - DP3 Architects

Summary of Proposed Phases

Phase I - Scare Pond Road & Recreation Area

Amenities

- Beach and Beachhouse
- Sand Volleyball Courts
- Amphitheater
- Picnic Shelters
- Boardwalk and Dock Improvements
- Boat Launch
- Restoration and Enhancement of Riparian Forest Buffer and Native Forest Environments
- Recreation Area Office and Rental Building Improvements
- Lake Loop Trail Improvements
- Connector Trail Improvements
- Signage and Wayfinding
- Access Road and Parking Area Improvements

Infrastructure

- Scare Pond Road Improvements
- Pumphouse
- Potable Water Supply Improvements
- Wastewater Treatment Improvements
- Fire Suppression Improvements
- Electric, Telecommunications and Fiberoptic Improvements
- Stormwater Management Improvements
- Maintenance Area Expansion and Improvements

Phase II - Lodge Lane & Wellbeing Center Area

Amenities

- Wellbeing Center
- Wellbeing Center Patio
- Yoga Lawn
- Wellbeing Trail and Meditation Reststops
- Trail Improvements
- Lodge Lane Widening Improvements
- Signage and Wayfinding
- Access Road and Parking Area
- Restoration and Enhancement of Native Forest
- Environment and Conservation of Riparian Forest Buffer

Infrastructure

- Lodge Lane Improvements
- Vertical Adventure Area Pumphouse
- Potable Water Supply Improvements
- Wastewater Treatment Improvements
- Fire Suppression Improvements
- Electric, Telecommunications and Fiberoptic Improvements
- Stormwater Management Improvements

Phase III - Vertical Adventure Area & Leadership Retreat Center (Phase A)

Amenities

- Vertical Adventure Area
- Leadership Retreat Center and Patio
- Climbing Features, Areas and Shelters
- Trail Improvements
- Event space for 200
- Breakout rooms/shelters
- Vertical Adventure Area Office, Public Restrooms and Locker Rooms
- Restoration and Enhancement of Riparian Forest
- Buffer and Native Forest Environments
- Welcome Center and Gatehouse
- Signage and Wayfinding
- Center Access Roads and Parking Area Improvements

Infrastructure

- Leadership Retreat Center Pumphouse
- Potable Water Supply Improvements
- Wastewater Treatment Improvements
- Fire Suppression Improvements
- Electric, Telecommunications and Fiberoptic Improvements
- Stormwater Management Improvements

Phase IV - Leadership Retreat Center (Phase B) Cabins & Bunkhouses

Amenities

- Bunkhouses
- Cabins
- Bunkhouse and Cabin Access Road
- Picnic Shelter
- Amphitheater
- Amphitheater Trail

Infrastructure

- Potable Water Supply Extensions
- Wastewater Treatment Extensions
- Fire Suppression Improvements
- Electric, Telecommunications and Fiberoptic Extensions
- Stormwater Management Improvement

Potential Approvals and Permits

Based on the improvements being proposed at the Stone Valley Recreation Area, and in addition to the University review and approval process, we anticipate that the project will need to be reviewed, approved, and in many cases permitted by the following agencies:

- Barree Township
- Barree Township Sewage Enforcement Officer
- Barree Township Fire Chief
- Huntingdon County Planning and Development
- Huntingdon County Conservation District
- Valley Rural Electric Cooperative
- PennDOT
- Pennsylvania Department of Labor and Industry
- PA Department of Agriculture Region 5
- Pennsylvania Department of Environmental Protection – Southcentral Regional Office
- United States Army Corp of Engineers
 - ✓ Water Obstruction and Encroachment Permit/Section 404 Permit
- Pennsylvania Department of Health
 - ✓ Beach and Bathhouse
- Pennsylvania Historic and Museum Commission State Historic Preservation Office Cultural and Archaeological Resource Clearance
- Pennsylvania Natural Diversity Inventory
 - ✓ PA Fish and Boat Commission
 - ✓ PA Department of Conservation and Natural Resources
 - ✓ PA Game Commission
 - ✓ US Fish and Wildlife

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