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**A Comprehensive Trail Inventory and Recommendations  
for Development and Maintenance of a Trail System in  
Delaware Water Gap National Recreation Area**

Appalachian Mountain Club Trails Program

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## Preface

This report is submitted by the Appalachian Mountain Club (AMC) in fulfillment of the National Park Service's (NPS) Cooperative Agreement No. CA4000-98015. With this agreement, the AMC and the NPS endeavored to gather, analyze, and present information necessary to improve and expand the trail system at Delaware Water Gap National Recreation Area (DWGNRA). The effort was to be realized by completing a comprehensive survey of the existing system and an assessment of work needs and potential trail developments, and submitting preliminary recommendations regarding expansion and maintenance of the trail system based on the survey and assessment.

In 1965 Congress circumscribed an area of 69,629 acres surrounding a 35 mile stretch of the Delaware river north of the town of Delaware Water Gap for use as a National Recreation Area. This land was to serve as the basin and the boundary for the proposed Tocks Island reservoir to be managed by the Army Corps of Engineers. The National Park Service was charged with managing the surrounding lands for public recreation and preserving the "...scenic, scientific, and historic features contributing to the public enjoyment..."(Pub. Law 89-158). The planned dam has not been built, though the legislative option is scheduled for debate in the year 2000. In 1978 the National Park Service assumed management responsibility for all lands acquired for the reservoir project. At this time the Delaware River contained within Park boundaries was designated scenic and recreational under the Wild and Scenic Rivers Act. Today, some 54,000 acres centered around a free-flowing river are available for public use.

### The AMC and the Delaware Water Gap

The Appalachian Mountain Club has been extensively involved with the DWGNRA for several decades. With a broad background in backcountry recreation and resource management and long-term involvement in the Delaware Water Gap region, the staff and volunteers of the AMC have dedicated substantial energies towards the DWGNRA since the

drive to protect the recreational opportunities of a free-flowing river and its associated outlying lands began. In 1975 the AMC was contracted to provide a report outlining potential options for recreation in the DWGNRA. The result was "A Proposal for Dispersed Recreation in the Delaware Water Gap National Recreation Area" (Appalachian Mountain Club 1975).

More recently, AMC chapters have hosted volunteer work events on several of the trails in the DWGNRA area including Worthington State Forest. These inter-chapter regional hands-on workshops have been held for the past few years as part of an effort to involve a broader cross section of the AMC constituency in preserving and protecting the trails resource at DWGNRA.

The Appalachian Mountain Club looks forward to future cooperation with the National Park Service in DWGNRA. Much needed work on the trails can be accomplished with a variety of options including expanded volunteer efforts, staff led work weekends, professional trail crews, and Trail Work Skills Training Programs for the NPS and other interested parties. The Club's experience with guidebooks and maps offer yet another avenue of cooperation.

## **DWGNRA Trails Committee**

In July 1988, the Superintendent of DWGNRA established a Trail Committee comprised of representatives from each park division. The purpose of the committee, in general, is to review trail-related information and issues, identify and discuss appropriate courses of action, and make recommendations to the Superintendent. One of the committee's initial functions was to oversee the development and implementation of the trails surveys described in this plan. Other primary duties include: (1) assemblage and review of all existing information on park trails and other pertinent information on trail surveys, planning, development, maintenance and management; (2) evaluation of available information to classify and prioritize trails for various types and levels of use and maintenance; and (3) recommend actions for the development and management of the park's trails.

The Trails committee has met monthly since its establishment and has been effective in accomplishing its objectives. The committee provides the multi-divisional perspectives necessary to effectively address complex trail management issues. In fulfilling its duties, the committee sought the assistance of the AMC in conducting the trail surveys and assessment resulting in this report and its recommendations.

## **Acknowledgements**

The authors would like to extend their appreciation to DWGNRA Trails Committee and other park staff who assisted us in the development, review, and execution of this study. We are also indebted to Maureen and Steve Hilaire for their untiring efforts to hike and map every trail segment in the park, as well as their participation in a work session on the Tumbling Waters Trail. Our gratitude is extended to Kent Johnson, an AMC member, who contributed significantly to the substance of this report as he helped coordinate many of the AMC's volunteer field efforts and uncovered the new historical information documented below. Dennis Regan, Program Director of the AMC Mid-Atlantic Regional Office, has also been instrumental in many aspects of this project. Many other AMC volunteers assisted in AMC sponsored work weekends sponsored during the period of this project.

## Executive Summary

DWGNRA fills an important niche with its ability to address the recreational demands of a large urban population. Its 54,000 acres help to serve nearly 30 million people living within a hundred miles of the park (USDI 1987). The interests of this population are varied. Fortunately, DWGNRA has a diverse topography, outstanding water and wildlife resources, and a vast network of roads and trails capable of supporting many recreation demands.

This report is part of an effort by the National Park Service to plan for, develop, and manage the trail resources of DWGNRA. The 1987 General Management Plan for DWGNRA established several mandates relevant to trail system development. Primary goals of the plan include ensuring that park development serve the needs of visitors and compliment the "...natural, cultural, and historical attributes of the region" (USDI 1987). The plan establishes that such development will allow the public to see and interact with natural and cultural resources first hand.

With the General Management Plan providing many broad goals, planning specific to trail resources is necessary in order to effectively develop a parkwide trails network. In 1989, the park initiated a Cooperative Agreement with the Appalachian Mountain Club to collect and analyze pertinent data regarding the park's existing and potential trail resources and appropriate trail planning, design, and management recommendations. Two types of trail surveys were conducted:

- 1) a rapid survey to locate and accurately map (at 1/400 scale) all park trails and roads, and
- 2) a prescriptive work log survey to describe selected trails, their condition, and specific maintenance needs.

The AMC was directed by the DWGNRA to include surveys of trails within Worthington State Forest, New Jersey, so as to provide the same quality of trail planning information to managers of the State Forest as was being provided to DWGNRA. The managers and staff of the two areas share a cooperative approach to providing a high-quality nature-based recreation resource.

The rapid survey revealed that DWGNRA has a considerable number of interconnecting woods roads and trails, many of which receive only limited use. The mapped trails and roads resulting from this survey provide the basis for all trail planning and will improve the park's information regarding backcountry access, enhancing search and rescue, fire fighting, and patrolling capabilities. The mapped trail and road segments for 49 topographic maps are currently being digitized for the park's computerized mapping system (Geographic Information System or GIS). This system will permit the output of maps depicting roads, trails, and other features at any desired scale.

The second survey provided prescriptive work logs for 55 selected trails and woods roads (approximately 77 miles total). Of these prescriptive work logs, thirty-nine (39) are DWGNRA trails (58.17 miles), and sixteen (16) are Worthington State Forest trails (18.49 miles). These work logs, included in a separate 160 page Addendum, provide a means to assess the existing condition of the DWGNRA trail network, work needed to establish trail systems of various configurations, costs associated with upgrading the trails, and various management concerns associated with use of trails.

Generally, the work logs show the majority of the park's trails to be in stable condition, primarily due to the light use they receive. In addition to reactive work needed to solve current problems, preparations are necessary to accommodate expected increases in overall levels of use and achieve greater dispersal of use. Considerable work will be necessary to accommodate additional use on trails selected for inclusion in the expanded trails system. The AMC recommends that expansion of the trail system occur in stages, arbitrarily referred to in this report as inclusion stages. Significant work is also needed on several trails which currently receive heavy use. According to figures from the prescriptive work logs, *stabilizing the existing trail system and upgrading the informal high-use footpaths and woods roads in DWGNRA alone will require between 604 and 821 days of labor to complete*, not including travel time to the various work sites (see Table I, page 17). Worthington State Forest will require additional effort estimated to be between 270 and 386 days of labor (see Table II, page 17). Appendix A contains summary figures for each area and for each trail. These figures do not reflect any new trail construction other than relocations recommended for resource protection reasons. In addition to trail tread observations and prescriptions other concerns related to safety, soil erosion, and non-pedestrian use of trails are also noted in the trail logs. See appendix B for exhibits of the survey forms.

Five general types of trails exist in DWGNRA or, as with proposed trails, do not exist but are discussed in this report (see Figure 1). Seven types of trail oriented recreation were noted during the field work portion of this project (see

Figure 2). The types of recreation listed do not include activities that visitors commonly pursue while on a trail, only those that directly require and impact trail resources.

- Officially designated DWGNRA trails
- Informal High-Use Footpaths
- Informal Low-Use Footpaths
- Informal Multiple-Use Woods Roads
- Proposed New Trails

Figure 1. Categories of Trails within DWGNRA.

- Hiking, walking.
- Road Bicycling, trail bicycling.
- Horse back riding.
- Skiing.
- Dog-sledding.
- Snowmobiling.
- Off-Road-Vehicle and All-Terrain-Vehicle.

Figure 2. Trail Oriented Recreation Noted in DWGNRA

In addition to reporting the findings from the two surveys, a number of trail resource management issues are discussed. These include use-related issues (types of use and the potential for conflicts, and backcountry camping), trail management issues (options for trail construction and management, regulation, and interpretation), and trail system expansion issues (use of existing trail and road networks and coordination of system expansion with park capabilities). Recommendations, some of which are highlighted below, were then derived from the study findings and considerations of various management issues.

### Recommendations

Certain factors determined the direction of our recommendations. Environmental considerations associated with trail maintenance weigh heaviest, especially those of erosion control, ecological carrying capacities, and disruption of wildlife. Other factors include predisposed use, visitor satisfaction, and potential user group conflicts. In some situations, several options for modified use present themselves. Here, we analyzed each option independently, presented the differences, and suggested a preferred option.

### Specific Recommendations

1. **Coordinate expansion of the physical trail system with expansion of maintenance and resource protection abilities.**
2. **Increase visitor oriented programs as the trail system expands. Promote only maintained and patrolled trails to ensure that the trails are capable of supporting additional use. Also, increase the availability of written information and educational materials. Specifically, develop necessary trails information including maps, trailhead displays, guidebooks, and trail signing and blazing.**

3. **DWGNRA Trails Committee should continue in its existing capacity.**
4. **Establish goals for trail maintenance.** Initiation of a trail maintenance program should begin with clearly defined goals which address the immediate needs of the system as well as long-term concerns.
5. **Pursue a program of expansion that makes full use of the personnel resources available.** A significant commitment of NPS personnel and funds will be necessary, including the coordination and training of volunteers from the many organizations which have shown an interest in the park's trails.
6. **Ensure that a long term agency commitment exists for maintenance, training, monitoring, and patrolling.** Address long-term needs, including agency dedication to annual maintenance work (trail signs, marking, drainage cleaning, etc), trail maintenance training, volunteer coordination, and trail resource monitoring.
7. **Establish goals for system expansion.** Minimize user group conflicts, resource impacts, promote trail system quality, and involve trail systems users. Plan for expanded backcountry ranger patrols and an increased frequency of search and rescue operations, medical evacuations, and fire ignitions.
8. **Evaluate trails and new connections for incorporation into the formal network.**
  - a) address existing, often predisposed, use that is negatively impacting park resources, and
  - b) wherever possible utilize trails that will accommodate the widest range of visitor demands with the minimal maintenance burden.
9. **Expand hiking opportunities.** Where appropriate, link existing trails to form networks and expand hiking opportunities, particularly for longer hikes and day loops.
10. **Expand opportunities for walking.** Provide short loop trails adjacent to visitor centers and picnic areas to facilitate walking.
11. **Pursue the concept of a multi-use Greenway trail and consider connecting such a trail with existing campgrounds.** The linear shape of the park offers several opportunities for such broad spectrum recreation trails.
12. **Expand opportunities for cross-country skiing.** Plan trail locations that will allow the most extended season possible.
13. **Promote both road and trail bicycling.** Select routes and promote maintenance which facilitates use that is both safe and non-damaging to the resource.
14. **Integrate equestrian use.** Select, upgrade, and promote user maintained equestrian trails capable of sustaining this type of use.
15. **Integrate snowmobile use.**
16. **Address off-road-vehicle use (ATV and ORV).** Address appropriateness of this use. If permitted, designate specific locations and monitor resource impacts. If not permitted, take steps to reduce access.
17. **Increase backcountry camping opportunities.** Designated site camping in more remote locations will facilitate the use of the trail system by hikers on extended hikes.
18. **Increase patrols.** Plan for expanded backcountry ranger patrols and an increased frequency of search and rescue operations, medical evacuations, and fire ignitions.
19. **Parking.** Improvements in placement, signing and design of parking areas related to trail use are necessary.

## **Trail System Proposal**

Based on the trail survey findings and meetings with park staff representing park management divisions, we have developed a proposed formal trail system for the park, depicted on a topographic map submitted with this report\*. This proposed system is offered as a starting point for further discussions among park staff, interested organizations, and unaffiliated trail users. The proposed system includes all trails receiving high use at present, many additional lightly used trails, and some entirely new trail segments recommended as connector routes. We have also indicated a proposed type of use (hiker, horse, bicycle) for each trail. It is difficult to assess the demand and subsequent use levels these trails might receive, particularly related to specific types of use. Therefore, planning and management of the formal trail system should strive to be flexible, recognizing the need for additional trails in the future and the possible need to revise the type-of-use designations.

\* **Note:** At the outset of the study we had expected to utilize the park's GIS system in producing a more detailed and accurate rendering of the proposed system. However, delays in digitizing the mapped trails and in filling a GIS park staff position have prevented this. We anticipate that the GIS may still prove to be an invaluable tool in the process as the park revises this plan in preparing its own Trail Management Plan.

## The Water Gap's History and Trends

It has been assumed that the most significant aspect of DWGNRA's history is natural. For example, as compared to descriptions of natural features such as geology, the historic structures in the park are described in the 1987 General Management Plan as "...old rather than historic, and stylistically representative rather than architecturally unique" (USDI 1987). However, historic information documented by this report help illustrate a far more colorful history, especially with regards to trails.

### Natural History

The natural history of the DWGNRA region, especially geological, has long distinguished the park. The Walpack Bend is the largest meander on the Delaware River and one of the best examples of this feature in Pennsylvania; the Water Gap, where the Delaware River breaches the Kittatinny Ridge, speaks for itself as a remarkable geological formation. Also, the two highest waterfalls in Pennsylvania are Dingman's Falls and Raymondskill Falls, both within the park.

Geologically, two distinct physiographic provinces are contrasted in the park, and the characteristics of each greatly affect trails of that region. The Appalachian Plateaus Province, found in the northern portion of the Pennsylvania side, is mostly composed of shale formations. Streams flowing from the Pocono Plateau, part of this province, have cut numerous waterfalls and gorges. The Valley and Ridge Province of the Appalachian Mountains marks the park's southern third. Here the Delaware cuts through Devonian age Buttermilk Falls limestone at Walpack Bend. Further south, marked by the actual Water Gap through Kittatinny mountain, is the Shawangunk formation.

DWGNRA's geology also supports a wide range of biological attractions: deer, wildfowl, hardwood and softwood forest, hemlock ravines, and even cactus along some of the more exposed cliffs. A few sections of virgin timber stands can also be found in areas which were not economical for harvesting.

## Cultural History

Prior to the 1740's, the Delaware Water Gap area was settled almost exclusively by various American Indian tribes whose presence has been documented from 14,000 years ago (USDI 1987). Several archeological sites in DWGNRA date back 8,800 years. The park also contains a number of structures representing the architectural and cultural influences of European settlement in the area.

The first trails appeared when nomadic indians began using the Delaware Valley after the last glaciation 12,000-14,000 years ago. They stayed in rock shelters like those near Peter's Valley in New Jersey (Yolton 1980) and Lake Lenape in Pennsylvania (Geyer and Bolles 1979). Two main trails were well established when European settlers arrived: the Minisink Path and the Minsi. Both of these paths were associated with the large indian village at Minisink island in the northern part of the park. The Minisink Path ran west to east from the Wyoming Valley to Minisink Island, the main village of the Minsi Lenape, before continuing to the Atlantic at the mouth of the Shrewsbury River. Within the park the path ascended Indian Point south of Raymondskill and followed the height of land west. The New Jersey section headed towards Hainsville, Branchville and Lake Hopatcong (Wallace 1971). The Minsi Path ran from the Lenni Lenape village at Philadelphia to Minisink Island on its way to what is now Kingston, New York. It entered the park near Totts Gap and followed the west side of the river north.

There are similarities between the indian paths and current trails and roads in the park. These paths were formed by use, much like the woods roads. And, like the Appalachian Trail today, shelters were constructed every ten to twelve miles along heavily used sections (Wallace 1971).

The first European influence was marked by the Dutch construction of a road along the Minsi Path from Kingston. This road continued to a copper mine in New Jersey from which the road receives its name, Old Mine Road. By 1755 the population of Europeans in the Delaware Water Gap area was estimated to be 800, living mostly on the New Jersey side.

By the 1840's tourism had supplanted the timber and quarrying trades within the local economy (Rupp 1845). This paralleled similar changes in the Catskills of New York and White Mountains of New Hampshire. Tourism of this age was a grand event as Americans sought to emulate European standards in a distinct fashion. Artists would often paint a scene from a particular vantage point that would then become a tourist attraction, thus trails criss-crossed the landscape.

Some of the trails from this period remain in use today, including sections of the Appalachian Trail near Mount Minsi and other trails near Sunfish Pond (Brodhead 1870). And, in a remarkable example of foreshadowing, some of these trails were blazed with "...white lines on every suitable rock and tree" (Brodhead 1870).

The Civil War brought a decline to the area that continued into the 1870's. After this time, however, the area again became a resort of national stature. It also became a site of international scientific investigation following the publication by G. Frederick Lewis in 1884 of a landmark paper which traced the boundary between glaciated and unglaciated regions in Pennsylvania. World War I marked a second decline.

It is clear that trails in the DWGNRA have a local and national significance which is greater than commonly thought. The importance of the region's geology remains, but that of the grand age of tourism and the trails which resulted seems likewise worthy of recognition and presentation.

#### **Relevant Trends in Recreation**

Visitor demands on the park are great and growing, especially since many outlets for recreation are provided. Due to its close proximity to the New York and Philadelphia metropolitan areas, the park is quite extensively visited throughout the year. Over 2.4 million visits were reported in 1989, up from 2.1 million in 1984 (USDI 1986, 1989). Public comments for the park's General Management Plan demonstrate strong interest in expanded hiking, bicycling, and camping opportunities in DWGNRA.

Beyond the mere growth in use, there are developing or resurgent uses likely to have a great effect on the park. Certain recreation endeavors are increasing in popularity: bicycling, mountain bicycling, walking, horseback riding, and bird watching. Other recreation pressures also affect the park's trails, namely all-terrain vehicles (ATV's) and off-road vehicle (ORV) use. Several of the recreation demands on the park result from the aging of the population at large, others are more related to local community interests and pressures.

## **Trail Survey Methods**

The results of this report are intended to provide baseline information for the planning of a park trail system and the maintenance of that system. Two types of surveys were conducted. The first, a rapid survey, documented the existence of the woods roads and trails in DWGNRA and the second, a prescriptive work log survey, documented the work needs.

The prescriptive trail survey of the DWGNRA revealed the amount of necessary trail work, while the rapid mapping survey highlighted the tremendous recreational resources available for development. Despite the amount of necessary work, the informal trail system in DWGNRA is in predominately good shape since visitor information materials currently available have directed the public to the more developed trails such as the Appalachian Trail, Worthington State Forest trails, Dingman's Falls trail, and the trails around the Pocono Environmental Education Center. River use is a major focus for recreation in the park, with canoeing the primary activity. Our observations indicate that the bulk of the trail system is under-utilized. While trail use does present maintenance and administrative challenges to the park, these problems can be successfully addressed by establishing concurrent programs of trail maintenance and system expansion.

### **Rapid Survey Methodology**

Resource managers require a variety of information about roads and trails in order to plan and develop pedestrian recreation networks, promote and regulate visitor use, and maintain and protect the natural resources. For these reasons

a comprehensive roads and trails survey was conducted to locate, map, and classify all road and trail segments within the park. Existing Army Corps of Engineers (ACE) maps compiled as part of the Tocks Island reservoir project provided initial information. The objectives of this work are as follows:

- 1) To accurately map on (1/400 foot scale) ACE maps all existing roads and trails within, and sometimes adjacent to, the park,
- 2) To classify and collect descriptive information on all road and trail segments,
- 3) To develop a computer database which permits the efficient input, analysis, and retrieval of road and trail survey information, and which can serve as a relational database.
- 4) To prepare overlays of all mapped road and trail segments for conversion into DWGNRA Geographic Information System (GIS).

In the spring of 1989, a rapid survey process began with solicitation and assessments of park staff information needs, development of field forms and procedures (see Appendix B), and field testing and revision of the forms. In addition to locating and mapping all road and trail segments, a variety of additional information was collected:

**Roads** - classification, route name and number, access, ownership, surface, width, length, maintenance, vehicle barriers, and snow removal.

**Trails** - classification, name, scenic features, water sources, major maintenance needs, vehicle barriers.

Refer to Appendix B for the specific descriptions for these parameters and codes used when compiling the database. Information from field maps were transferred to mylar sheets at the same scale in preparation for conversion into a digital graphical computer database, a process referred to as digitization. An additional road and trail segment label overlay was also prepared. This survey and mapping work required two staff approximately 6 months to complete.

Map overlays have been digitized and await error-checking by a trained GIS operator. Maps produced via GIS were unavailable at the time of publication. When completed, GIS analytical capabilities will enable the park to summarize the number and lengths of trail and road segments by the various categories of the parameters in the database provided in fulfillment of objective three of this project.

## Prescriptive Work Log Survey Methodology

Trail maintenance, design, and construction requires the installation of a tread design appropriate for the type and level of use, local weather factors, and local soil conditions. The objective for a prescriptive work log is to document the prescribed engineering solutions that address either existing or anticipated problems. Rather than emphasizing a physical description of the problem, this method addresses the cause as well as the effect. In addition to trail maintenance needs, the prescriptive work log survey in the DWGNRA documented observations pertaining to existing use, general soil composition, slope of the tread, severity of existing soil erosion, and the source of existing erosion, as well as viewsheds and other trail features.

Any type of trail work can be referenced on a work log. Four basic categories of trail work are commonly referenced:

- 1) **basic maintenance:** sidehilling, brushing, new tread (duffing, grubbing), blazing, signs, clearing;
- 2) **drainage:** waterbars, dips, ditches;
- 3) **tread hardening and stabilization:** native material (rock or wood) steps, cribbing; and
- 4) **tread elevation and engineered structures:** stream bridges, bog bridges, puncheon, and ladders.

To compile the prescriptive work logs, sections of trail were hiked while pushing a measuring wheel. A microcassette recorder was used to compile comments regarding features and any necessary work while noting the distance registering on the wheel. These tapes were then transcribed, edited, and the work-need figures compiled in a computer database. The resulting document is useful for office and field needs, or project planning and implementation, whether the work is done by agency staff, volunteers, or contractors. The work logs developed by the AMC Trails Program as part of this project are separately bound under the title "Prescriptive Work Log Addendum" submitted with this report.

The database allows a composite of work items to be compiled and tabulated for any trail in the system or for the system as a whole. Resultant totals allow estimation of costs for completing work on specific trails. These costs are based on available information regarding time and equipment required to complete a certain task referenced on the work log. Each trail synopsis in appendix A provides estimates of the labor required to bring individual trails into the system. The conversion factors used to obtain the labor estimates are found in Table A-I (see Appendix A, page A-7).

## Trail Survey Findings

The condition of existing trails, including those of the informal network, varies tremendously. A trail's original layout, the type of use, and intensity of use combine to determine the maintenance requirement. In the DWGNRA, trails with severe problems are often associated with spectacular natural features attracting many visitors, but even sections of tread receiving relatively low use occasionally display signs of erosion damage. Increases in use intensity or changes in use type will also affect trail-tread condition.

Observations and data from the field surveys substantiate many of the concerns that park staff and others have about the trail system. It is clear that scenic features such as waterfalls will attract and predispose visitation levels and visitor activities to such a degree that options for altering visitation become limited. In these areas, the protection of the resource and hiker safety will necessitate relatively complex designs to contain use where appropriate and provide an improved route, as compared to existing scramble-paths. Seasonal maintenance needs such as removal of blowdowns, installation and inventory of directional signs, trail blazing, and brushing out of trails will need to be addressed with the completion of an official trail system plan.

Problems related to use are often compounded by weaknesses in the tread itself. The trail may have a lack of basic drainages or a poor original layout may aggravate an already unstable slope by ascending too steeply. By and large, though, the majority of the problems can be repaired through the installation of basic drainages and the institution of a program of annual maintenance. Preventative maintenance and construction will positively influence the long-term cost per mile of DWGNRA's trail system. Tread hardening and stabilization is also required to eliminate some of the problems. The results of field data from this project, however, indicate that several existing informal trails are stable enough for immediate inclusion in the formal system promoted to the visiting public. Because of the condition of these trails, it is possible to actively direct use to them while the maintenance capabilities of the park are still being developed. Comments concerning specific formal and informal trails are contained in the inventory section of this report.

While the system is generally in fair condition, DWGNRA does face some immediate maintenance needs on its trails. An estimate of the amount of labor required to implement the recommendations of this report has been compiled for DWGNRA (see Table I) and Worthington State Forest (see Table II). These figures were obtained with conversion

factors employed by the AMC. The conversion factors are listed in appendix A, and have been developed through review of work records of the AMC Trails Program. Figures for the total amount of work needed on each trail were converted into estimates of labor by multiplying the work figures by the conversion factor. Once DWGNRA establishes a formal trail maintenance program, conversion factors based on records of DWGNRA trail work may be substituted and the estimates updated.

**Table I:** Estimated Days of Labor required to complete the recommended trail work in DWGNRA.

Area and Recommended Inclusion Stage		Estimated Days of Labor	
		Low	High
DWGNRA: All trails	39 trails; 58.17 miles	604.26	820.71
DWGNRA: Stage 1	22 trails; 35.72 miles	351.00	485.14
DWGNRA: Stage 2	11 trails; 16.45 miles	174.69	232.71
DWGNRA: Stage 3	6 trails; 6 miles	78.57	102.76

**Table II:** Estimated Days of Labor required to complete the recommended trail work in Worthington State Forest.

Area and Recommended Inclusion Stage		Estimated Days of Labor	
		Low	High
Worthington S.F.: All trails	16 trails; 18.49 miles	270.34	386.12
Worthington S.F.: Stage 1	14 trails; 17.00 miles	253.93	365.04
Worthington S.F.: Stage 2	2 trails; 1.49 miles	16.41	21.08

The AMC's recommendation that DWGNRA's trail system be established in stages has been applied to a review of the maintenance figures compiled during this project. The phrase inclusion stage, found in the prescriptive work log summaries, indicates at what stage the AMC recommends a trail be incorporated into the formal trail system. A tally of the prescribed work necessary to establish a stage of the DWGNRA trail system has been completed (see Tables I

and II). This recommendation is based on weighing the trail's contribution to the system against the trail's estimated costs. In some cases, issues such as site popularity were also considered. The AMC expects these recommendations to be modified by DWGNRA during public review.

To estimate the required days of labor to complete the recommended trail work in DWGNRA and Worthington State Forest required a complete tally of the necessary work. This tally was completed for trails managed by each agency and includes summaries for each work item category (see Table III for DWGNRA and Table IV for Worthington State Forest).

**Table III: Summary Figures from Comprehensive Work Logs, DWGNRA.**

Number of Trails Surveyed: 39

Total Length: 58.17

Item	Maintenance Figures		Estimated Days of Labor	
	Total Feet	Units	Low	High
Rock Steps	n/a	322	80.50	107.35
Log Steps	n/a	360	60.00	90.00
Step-stones	n/a	536	107.20	134.00
Ditching	5572	313	111.44	139.39
Wood Water Bar	2160	165	54.07	71.99
Rock Water Bar	421	42	21.05	42.10
Cribbing	565	11	28.25	56.50
Stream Bridge	156	6	94.54	118.17
Bog Bridge	509	63	14.55	20.36
Sidehilling	3266	n/a	32.66	40.85
<b>Estimates of Total Labor Required:</b>			<b>604.26</b>	<b>820.71</b>

The trail system inventories illustrate system conditions and possibilities. DWGNRA planning documents and observed current activities also identified issues related to trail system development. Recognizing and understanding the significance of these issues and appropriately addressing them will enhance any expansion of the trails and the various

**Table IV: Summary Figures from Comprehensive Work Logs, Worthington State Forest, N.J.**

**Number of Trails Surveyed: 16**

**Total Length: 18.49**

Item	Maintenance Figures		Estimated Days of Labor	
	Total Feet	Units	Low	High
Rock Steps	n/a	112	28.00	37.33
Log Steps	n/a	13	2.16	3.25
Step-stones	n/a	91	18.20	22.75
Ditching	5038	293	100.76	126.00
Wood Water Bar	474	40	11.88	15.79
Rock Water Bar	488	31	24.40	48.80
Cribbing	690	n/a	34.50	69.00
Stream Bridge	81	3	49.09	61.36
Bog Bridge	35	4	1.00	1.40
Sidehilling	35	n/a	0.35	0.44
<b>Estimates of Total Labor Required:</b>			<b>270.34</b>	<b>386.12</b>

**Note:**

The summaries of these trails, found in appendix A, include a 1x and 2x convention for the Stage to Incorporate into Trail System. This is to distinguish DWGNRA trails from Worthington State Forest trails.

recreation offerings of the system.

**1. Safety.** Several trails have immediate safety needs which should be remedied prior to any effort to direct use towards them. Again, the overall system is in predominately good shape, but a few trails do need immediate attention regardless of expansion plans. Indian Ladders, Tumbling Waters, Van Campen's Glen, and Adam's Creek are examples of such trails. Necessary projects include well-constructed stream bridges of various lengths, complex rock and wood trail tread cribbing projects, and signs to indicate dangerous road crossings. Similar signs to warn drivers should be installed on roadways as well.

**2. Erosion.** Erosion of soil resources is occurring to varying degrees throughout the trail system. This results from natural flows of surface water occurring on different soils that make up the tread. Much of this can be mitigated by the installation of drainages to divert water from the tread. Drainage improvement is the fundamental piece of preventive maintenance for trail construction and maintenance. The general simplicity of drainage installation makes for excellent volunteer projects. Some erosion is due to the type or intensity of the recreational use. Hardening of the tread in some sections is necessary. This is accomplished through the use of rock steps, stepping stones, bog-bridges (sometimes referred to as puncheon), or fill.

**3. Signage.** Improved trail marking will also lessen some of the current impacts by defining the tread. A well marked trail, besides directing use and helping contain visitors to the preferred route of a trail, instills confidence in the users and promotes the image of a well tended system.

**4. Non-Pedestrian Use.** Some non-pedestrian uses are having a negative impact on the existing trail tread. For example, equestrian use is affecting trails that have not been designed to withstand such impacts. While there are sections of wood-roads with a surface capable of supporting heavy animal traffic, horse use was also noted in areas that will rapidly show the effects of trampling.

Other potentially serious impacts to the trails result from off-road-vehicle (ORV) use and all-terrain-vehicle (ATV) use, currently illegal within DWGNRA. Indications of such use on several trails in the park were observed during the course of this study. Such vehicles often impact zones peripheral to the main trail with exhaust and noise. Informal observations during the field work of this study indicate that it is quite common for ORV and ATV riders to meander from the usually narrow intended trail corridor. Beyond the immediate damage to less resistant vegetation, soil compaction resulting from this type of riding can damage large trees through root damage and an alteration of the aspiration efficiency (Hammit and Cole 1987). These various impacts are occurring in areas of DWGNRA, including hemlock groves, a more impact sensitive feature.

Limited use of the Appalachian Trail by mountain bicyclists, horseback riders, and ORV users was noted and is a concern. Recommendations of this report related to broadening the trails experience in DWGNRA reflect the need to segregate this corridor so that it remains the pedestrian route it was intended. Should the accepted recreational uses of the Appalachian Trail corridor be modified locally or inclusively, changes in the park's trail management may result.

**5. Geology.** The varied geology within DWGNRA will affect options for completing necessary construction on the trails. Shale formations like those found throughout much of the Pennsylvanian side of DWGNRA will require log steps and log cribbing to retain the soil, but the drainage needs will likely be less due to shale's permeability. There are other areas of the park which have a predominately limestone based geology. Here rock steps and rock cribbing will be possible, a very durable solution. Drainages will be more critical along these sections of tread to protect the soil resources. As solutions to the resource threats identified by this report are implemented, differences in geology must be weighed to ensure the most cost-effective construction.

**6. The Adaptability of Wood Roads to Trails.** Abandoned roads, both woods roads and some of the abandoned paved ones, and a network of lesser used trails provide the park with a considerable resource for expanding the trail system. One of the strengths of the DWGNRA trail network lies in the possibility of enlisting many existing woods roads to provide recreational outlets for visitors. While a truly valuable feature of DWGNRA, the adaptability of woods roads for use as trails is not a panacea for recreation demands in the area. Some possible drawbacks from a heavy reliance on these roads were pointed out in the 1975 AMC proposal for dispersed recreation: "...directing traffic in this manner may degrade rather than upgrade the experience, both by presenting less interesting areas of the Park, and by overextending Park personnel" (Appalachian Mountain Club 1975).

In many places, woods roads do provide a good, stable primary tread for horse and bicycle use. The more gentle grades necessary for roadbeds also provide introductory or less physically demanding experiences for hikers and other pedestrian oriented users. Woods roads offer potential for expansion of the trail system. Some sections, with additional construction, offer new side trails or loop opportunities for hiking and in a few cases offer new routes for existing poor quality footpaths. However, because roads are rarely built with recreational purposes in mind, few of the roads access the higher points or most scenic spots in a given area, nor do they provide as challenging a route as foot paths. This is definitely true in DWGNRA. Woods roads broaden the opportunities for expanding recreation offerings and will likely lessen the initial costs of doing so.

As the work logs of this report demonstrate, wood roads in the DWGNRA show existing repair and maintenance needs. Repairs to the woods road network are necessary prior to initiating any new use which will exacerbate these preexisting problems. A preliminary effort to prepare the roads for expanded usage will reduce the long-term cost of maintaining the system.

**7. Current and Anticipated Use Patterns.** The 1987 General Management Plan for DWGNRA offers estimates of the current and anticipated use levels (USDI 1987). The following statements are notable:

- Hiking is one of the more popular activities and occurs throughout the year.
- Nearly half of the 2-2.5 million annual visits occur during the months of June, July, and August.
- Sightseeing from roadways or while on hikes are very popular activities.
- The Pennsylvania side of the river receives more recreational use than the New Jersey side.
- The New Jersey side has more area than the Pennsylvania side, and this area has more unrealized recreation potential.
- Cultural interpretation activities are popular and occur in a variety of places and through several methods.
- 90% of visitors predominately use a private vehicle during their visit.

Field observations clearly demonstrate that a number of activities take place on DWGNRA's trail system. These observations accurately correspond with those referenced in the General Management Plan. Hiking or walking are predominant while skiing, snowmobiling, equestrian use, bicycling, and even ORV use can all be found at times and in places throughout the system. The trails access waterfalls, scenic vistas, historic sites, lakes, and other attractions of the park.

**8. Campsites.** As stated in the General Management Plan, three types of camping opportunities will be provided within DWGNRA: developed camping (with water and comfort facilities), primitive backcountry camping (without comfort facilities), and group camping. The plan states that commercial campgrounds outside the park will continue to accommodate much of the demand for developed camping, and that camping facilities inside the park will be dispersed and limited in size to avoid direct competition. The plan also states that backcountry camping at DWGNRA will provide opportunities for hikers and canoeists to experience areas that are more remote than heavily visited day use areas and developed campgrounds. Such campsites are to be established with minimum disturbance of natural resources.

Backcountry camping is mentioned as one of the public's preferred areas of focus for expansion, according to comments in the General Management Plan and is presently permitted along the Delaware River and Appalachian Trail. This use can be expanded along with the trail system since trails serve as means of accessing and using the backcountry. Campsites allow use to be extended from hours to days. This, however, places certain inherent management demands on a park. Decisions must be made as to whether to emphasize dispersed use, use of designated and hardened sites, or some combination. Facilities must be constructed and maintained to a level appropriate for the intended or actual type of use. In DWGNRA, expanded backcountry camping opportunities would appeal to public recreation demands identified in the General Management Plan. Dispersed camping is indicated in the General Management Plan as the preferred

policy for the park's backcountry (USDI 1987). Several possible options for addressing the need for backcountry campsites, as distinguished from sites related to river use, are included in the recommendations of this report.

Other options for addressing the public's camping interest include trailhead walk-in sites. Such sites are often easier to maintain and manage, and more accessible, both of which suggest that the needs of the park, park managers, and urban visitors will be served.

**9. Other activities.** The DWGNRA trail system provides a medium for the pursuit of recreation needs other than hiking and activities with similar physical demands. Because of the varied natural habitat in the park and growing public interest in environmental concerns and personal health, the trails are also conducive to activities such as birding, nature walks, and non-pedestrian pursuits that appeal to an aging and frequently urban population of visitors.

The woods roads in the park also offer possible access to individuals who use wheelchairs or have other physical limitations. In fact, one trail near the Pocono Environmental Education Center has been successfully converted to a nature trail for the visually-impaired. Our survey revealed that existing trail tread necessary to support handicapped users appears to exist in several areas. It is important to note that specific disabilities imply certain levels or types of construction methods. A trail for the visually-impaired may not serve the needs of wheelchair users.

Consumptive pursuits also find outlets in DWGNRA and trails offer a direct means of access. For example, hunting and fishing are seasonally popular activities, and the road and trail network allows thorough access to the backcountry.

**10. Illegal use, user conflicts, visitor satisfaction, and other management concerns.** During the field survey for this report, examples of uses and potential conflicts were observed that are typical of concerns faced by many park managers. Resource protection, visitor safety, and visitor needs are the premier issues relative to trails in DWGNRA. In addition to reactive work needed to solve current problems, preparations are necessary to accommodate expected increases in overall levels of use and achieve greater dispersal of use. There are some existing problems, but it is the expansion of the trail system and the broadening of overall use of the system that will lead to new issues to be anticipated. Direct documentation of user interaction was never an objective of this study, but the field findings illustrate several nascent problems for DWGNRA.

Features of DWGNRA include those recognized as being quite appreciated by visitors interested in active forms of relaxation, especially when the historical, cultural, and natural resources are presented as a part of an active park and recreation area. Some areas, however, have been identified by NPS resource management staff as being sensitive to use

because of either the possible or confirmed existence of a plant species listed as threatened or endangered. Use of the trails in either the spring or fall wet-seasons can exacerbate problems with soil composition and erosion. Basic drainages, as referenced in the work logs, will often be enough to protect the tread from damage during these off-season periods. Plans for expanding the trail system should be cognizant of any difficulties that a particular use may present. Nevertheless, it is possible to manage trail use and backcountry visitation to effectively protect these areas with either engineering efforts to contain use or through the actual routing of the trail. As with any effort to manage use, greater cooperation from visitors will be achieved by providing information explaining the sensitivity of the area protected (Manning 1986).

There are several types of illegal use occurring that are causing resource damage. While any type of use implies some degree of impact, certain types require more maintenance or management attention than others. There are several pertinent examples of this occurring in DWGNRA such as ORV riders operating on the Appalachian Trail, damaging river edge lands near the Hogsback area in Pennsylvania, and causing probable root system damage in some of DWGNRA's Hemlock groves. Further, damage resulting from equestrian use was seen along the Appalachian Trail and in several areas susceptible to compaction. And, occasionally bicycle tracks appeared near horse tracks. From these and other observations, it is clear that uses often overlap in DWGNRA, and that conflicts between these same uses have been documented in similar recreation complexes. Of the many activities possible in DWGNRA, only a few seem likely to be problematic. Uses or user groups whose relationships have been shown to be potentially incompatible include horses and hikers, horses and bicycles, bicycles and hikers, horses and cross-country skiers, cross-country skiers and snowmobiles, horses and ORV, and ORV and pedestrians (Manning 1986). Some of the relationships are more antagonistic than others. The reasons for user group conflict are many and varied. For example, misunderstandings or behavioral perceptions can be influential. Subjective opinions generate personal reactions to a use or to social or economic values attributed to participants. This influences the ability for one user to relate to another who is involved with a different pursuit. Both real and perceived safety or environmental threats are often underlying concerns. The coping ability of individuals will affect their response to alternate uses. For this reason, limited designed overlap of uses is often the preferred management technique.

Another factor affecting management decisions is predisposed use, visible in the DWGNRA, often associated with the popularity of a site. Local tradition or the attractiveness of a feature can create a maintenance nuisance whereby

predisposed use in certain locations of the park affects the options available for recommendations. In some areas, established use will be difficult to alter without great effort. This limits the options for redirecting use. In addition to various construction techniques, effective use of public information and education efforts can help counter the problems associated with predisposed use.

Visitor satisfaction can be a seemingly nebulous factor, but it is no less important to consider. While the quality of a recreation experience and the availability of recreational opportunities each play a role in the ideal of visitor satisfaction, quality is most dependent upon the social factors affecting visitors' perceptions. The availability of recreational opportunities, however, is determined by both management action and the original potential of the resource (Manning 1986). By this measure, a diversity of options and the provision of the greatest overall experience are more important to visitor satisfaction than achieving the highest quality of any specific experience. Realization of one recreational opportunity need not be to the detriment of others.

Fortunately, several mitigating factors are available in DWGNRA. For example, uses can often be spatially separated or they can be temporally restricted to seasons most suitable for a particular activity. Three avenues for redirecting visitation may be pursued. Information and education efforts can be used to direct people to areas where their expectations can best be met. By cooperating with state or other federal recreation areas, a second avenue, some demands could be redirected to regional locations better suited for a particular use. Finally, regulation or enforcement are available as means for managing recreation conflicts and resource impacts.

## Recommendations

The park's physical environment, natural and cultural history, and past, present, and projected recreational uses are all important considerations in the development of an equitable and fully integrated trail system for DWGNRA. Satisfying diverse recreational demands requires recognition of potential conflicts between non-compatible uses, and comprehension of the role visitors' perceptions of crowding play in determining the satisfaction of a visit. Finally, resource impacts associated with the various trail uses must also be considered in the formulation of a trail management plan capable of providing outdoor recreation benefits while protecting the scenic, scientific, and historic resources of the park.

The development and expansion of a trail system is best accomplished by the implementation of several complimentary programs. Too rapid expansion of the trail system will quickly detract from the visitor experience and result in a deficit maintenance situation. Park staff must remain alert to this possibility throughout the trail system planning process. Efforts must be directed towards a maintenance program that makes full use of various personnel options to stabilize any problems with the existing formal system, especially where visitor safety is a concern. A calculated expansion of the formal system can be initiated beginning with those informal trails that are the most stable and progressing to trails requiring a great deal of work. These efforts will require a significant expansion of trail maintenance and backcountry patrol capabilities and offer opportunities for extensive involvement of cooperative trail organizations. Further, a planned program of services and visitor management with its various components will be crucial to any comprehensive trail system plan. Support facilities, information and education efforts, backcountry patrol capabilities, and transportation options will all contribute to the success of a visit to a well maintained system of trails.

- 1. Correlate expansion of the physical trail system with expansion of maintenance, resource protection, and visitor services abilities.**

Because of DWGNRA's vast network of informal trails and woods roads, it is possible to rapidly establish an official trail network that is beyond the ability of existing maintenance capabilities to manage. System expansion must be concurrent with the dedication of additional maintenance and resource protection resources. These resources can be either those of an agency, in this case the National Park Service or Worthington State Forest, or those of cooperative trail organizations or volunteer representing one or more of the visitor constituencies.

- 2. Increase Visitor Oriented Programs as trail system expands.**

The ability to manage increased visitation and more dispersed use along the trail system requires a commitment to visitor management and visitor services. These commitments must be coordinated with the expansion of the trail system if the goal of a high standard visitor experience is to be realized.

The informational materials currently available to the visitors of DWGNRA direct use to those areas most capable of supporting heavy visitation. A thorough documentation of the informal road and trail network has been accomplished as part of this project. These materials will be helpful in distributing use by allowing professional presentation to the public of maps and other trail information. While immediate updating of some of these materials will be well received, presentation of the majority of this information should be coordinated with an expansion of the Park Service's abilities to maintain the trails, provide services to visitors, and manage dispersed visitation in order to avoid stressing the existing capabilities.

A visitor's experience will be as equally affected by the quality of programs and information that guide them to the recreational resources as by the actual resources. The informational materials, the distribution of those materials, the availability of backcountry facilities, the availability of parking, the type of regulatory effort, and transportation options are all examples of visitor oriented programs that will affect the recreational experience of DWGNRA.

Maps of the formal trail system along with directions to trail heads represent a critical deficiency of the interpretive materials available in DWGNRA. Work done as part of this project will provide the information necessary to remedy this situation. It is important, though, that the distribution of information on maps is coordinated with the establishment of a formal, maintained trail system, as discussed above. It also may be helpful to develop some maps designed for specific types of use. For instance, a map of wood roads for hunters, bicycle routes for the cyclist, or established horse trails for equestrian users.

Unstaffed Wayside Exhibits (Kiosks) and Trailhead Informational Displays offer one method to relieve some of the pressure at visitor centers by serving as alternative outlets for information. Displayed information can suggest local opportunities for hiking and other recreation endeavors of varying degrees of difficulty, as well as reminders to the public about the importance of minimizing impacts. Such efforts can positively affect maintenance costs, reduce the problems of littering, and increase awareness of fire danger. It is recommended that a system of unstaffed wayside exhibits (kiosks) and information displays be developed within DWGNRA and that road signs be installed to direct visitors to them.

A Guidebook containing comprehensive information describing the trails according to recommended use, degree of difficulty, and remarkable features should be well received by the public and is recommended. Coordinating the contents of the guidebook with the system's expansion will allow use to be concentrated on formal trails that have been prepared for increased traffic. The AMC has extensive experience in the compilation and publication of guidebooks throughout the northeast, would be available to work with the National Park Service towards this end.

Signing of a trail system can affect the public's perception of that system. Well maintained trail signs with a standard format and locally meaningful names will enhance a trail system's image and facilitate public access. The nomenclature chosen for the trail names can reference historical, cultural, or natural features associated with the trail. The network of woods roads with many junctions that can confuse visitors unfamiliar with the area makes the sign system in DWGNRA crucial to visitor safety. This report recommends that a standard format be defined for signs in DWGNRA, that such signs be installed at all trailheads and junctions, and that a survey of the sign system be compiled seasonally.

Marking of trails with either paint blazing on appropriate trees and rocks or metal or plastic markers is important along hiking paths, especially with many informal trails interspersed with the formal system. The portion of the visitor population that has not spent much time in the out-of-doors will feel more at ease with the reassurance of blazes that indicate they are still on a formal trail. It is recommended that the blazing in DWGNRA be based on the Appalachian

Trail format where the AT is white, direct feeder trails are blue, and all other trails are yellow. On the Pennsylvania side of the river, where the AT is not a factor, it may be appropriate to use blazing to indicate trail types or levels of challenge. Further, it is recommended that paint blazing rather than metal or plastic markers be used since it is easily done and inexpensive. Metal or plastic markers are more costly, provide an easily removed memento, and are perceived to be more of a human obstruction than paint blazes. Paint blazing of trails needs to be considered a part of the seasonal maintenance of the DWGNRA trail system.

**3. DWGNRA Trail Committee should continue in its existing capacity.**

It is recommended that the Trail Committee continue to serve in its current role described above. A reassessment of the role of this committee may be necessary once the park develops and fills a Trails Coordinator position. In general, the committee should retain its existing functions while transferring the development and coordination of all trail maintenance and construction activities to the Trails Coordinator.

**4. Establish goals for trail maintenance:**

- a. Protect park resources through a planned program of trail maintenance and trail construction.
- b. Promote visitor safety and ensure the provision of high quality recreation experiences.
- c. Establish cooperative public service partnerships with volunteer organizations where appropriate.

The ability to maintain a trail system's natural and constructed resources appropriately for a given profile of use is critical to the well-being of those trails. A good trail maintenance program will have clearly defined goals, will address the immediate needs of the system, and will pursue solutions to problems in ways that recognize long-term concerns. Resource protection, visitor safety, and the appropriate involvement of visitors in planning and maintenance activities should be at the forefront of any set of goals for trail system development in DWGNRA.

**5. Pursue a program of expansion that makes full use of staff, cooperators, and volunteers.**

- a. Seek new personnel and funding for trail development, maintenance, and protection.
- b. Utilize cooperative trail maintenance organizations, wherever appropriate, to provide time for DWGNRA to develop in-house capabilities.
- c. Recognize and facilitate the training of staff and volunteers required for a successful volunteer based program.

A significant commitment of personnel and funds towards expansion and maintenance of the trail system is necessary, and clearly staff at DWGNRA recognize this need. Much can also be accomplished by utilizing the available skills of volunteer organizations who have shown a genuine interest in DWGNRA. In fact, most of the primary problems can be solved in an expeditious manner that will not strain the current park personnel structure. Such initiatives can be used to generate interest among other groups that are available to assist the park as representatives of various user constituencies. The AMC and other groups are often capable of providing training programs for individuals interested in participating in trail maintenance. Cooperative efforts will require active participation of park personnel to provide some training and oversight, to ensure the quality of the work, and to avoid any activities capable of disturbing critical resources. More importantly, active participation will allow for skills to be exchanged to the benefit of all parties involved.

**6. Ensure that a long term agency commitment exists for maintenance, training, monitoring, and patrol of the system.**

The DWGNRA trails face several long term needs which must be reflected in the goals and preliminary efforts recommended above. The primary long-term needs are:

- **Commitment of the agency to seasonal, basic maintenance of the system using a mixture of agency and cooperator personnel.**
- **Early and continued emphasis on training of both volunteer and park personnel in safe, applicable trail maintenance techniques.**
- **Initiation and promotion of events utilizing volunteer efforts and the resources of cooperating organizations.**
- **Expansion of options for professional trail maintenance.**

**Figure 3. Long-term trail system management needs, Delaware Water Gap National Recreation Area.**

As staffing and funding continues to be limited, options available to address long-term trail maintenance must be expanded. Park maintenance personnel and the pool of cooperating organizations are complementary components of the set of options available for completing necessary work. Interactive training sessions like those operated by the AMC Trails Program can facilitate the dissemination of techniques used in trail maintenance while providing a constructive arena for representatives of many recreational endeavors to exchange ideas. While volunteer programs require staff time and resources, they provide an avenue for enthusiastic public involvement and can be used to address seasonal needs of the system as well as many construction needs. Volunteers are an important park constituency and promote user stewardship.

A number of resources capable of promoting volunteerism are locally available to the park. Environmental education centers within DWGNRA may be able to participate in volunteer activities. One or more surplus buildings remaining in the area could be converted to a volunteer trail program base

- (1) **Adopt-A-Trail.**
  - Requires training, tools, and oversight of participants. Promotes user responsibility.
- (2) **Service Trips (10-12 day projects).**
  - Trained, experienced leaders provided.
- (3) **Weekly work camps.**
  - Facility or tent camps necessary to house and feed participants. Can serve as base for special projects as well.
- (4) **Trail Days.**
  - A high visibility volunteer work day, often annual. Can focus on multiple projects. Requires leaders, registration system, and preparation.
- (5) **Weekend or single day group projects.**
  - Can include many diverse groups. Requires leaders experienced with trail work.
- (6) **Seasonal Professional Trail Crew**
  - Cooperative cost sharing, highly skilled.

**Figure 4: Volunteer Program Models.**

camp to facilitate the use of volunteers. The AMC has successfully operated three volunteer work base camps in the northeast. A similar model might be implemented in the park. AMC Chapters, Trails Day events, seasonal professional trail crew, and service trips also provide models of successful trails oriented work programs.

The park will need to institute a monitoring program to periodically document trail maintenance needs. Often an informal review by trail maintenance personnel will be sufficient. The work logs compiled as a component of this project will serve as a good baseline and may be repeated as necessary. This information will need to be updated as sections of trail become subjected to more stressful levels or types of use.

Annual review of basic maintenance efforts, major reconstruction or relocation projects, and cooperator accomplishments is critical to long-term success in trails endeavors of the DWGNRA. Participation of cooperators in this review process is, likewise, important.

#### **7. Establish goals for system expansion:**

- a. Recognize and minimize potential conflicts between user groups.
- b. Promote system configuration which will minimize resource impacts.
- c. Strive to achieve and maintain a system of the highest quality.
- d. Solicit and promote active involvement from trail system users.
- e. Install directional trail signs at all junctions and maintain yearly updates of the sign system condition (see recommendation 2, page 28).
- f. Promote connections to trails outside DWGNRA boundaries and evaluate potential connections on individual basis.

The addition and expansion of new recreational uses to DWGNRA, from trail biking and horseback riding to semi-primitive backcountry camping, will require an expanded Park Service presence in the field, as well as expanded regulatory efforts. An expanded trail system and associated visitor use are likely to increase the frequency of search and rescue situations, medical evacuations, and fires. Additional seasonal backcountry rangers or "ridgerunners" to patrol, provide information, and monitor use in the backcountry will be necessary. As with park maintenance, the expansion of the trail system must be correlated with expansion of resource protection capabilities.

To guarantee the highest quality trail system, the goal must be to offer a recreation infrastructure that addresses the needs of visitors and managers alike. Segregation of uses according to visitor expectations and compatibilities will appeal

to the visitor's sense of identity and bolster the perception of a quality recreation experience. Some integration of user groups, however, will help foster greater understanding and appreciation of other forms of recreation. For example, the Thunder Mountain area could have sections of trail that promote horse and hiker interactions.

It is also necessary to recognize any limitations in the capacity for that infrastructure to support the various needs. For example, the hemlock ravines in DWGNRA are sensitive to vegetative trampling and soil compaction. And, the Appalachian Trail (A.T.) corridor will often implicitly complicate the idea of introducing certain uses to roads or trails along the periphery of the corridor if the new use is incompatible with or will impact the AT. The Pool area, Long Pine Lake, and Crater Lake are examples of locations adjacent to the AT where existing road bed is being considered for possible bicycle paths or horse paths. Management techniques can often reduce conflicts to the point where they become acceptable.

Minimizing potential conflicts while simultaneously ensuring that resources are protected from negative impacts is possible without being expensive or burdensome. By promoting the separation of non-compatible uses, and by directing specific forms of recreation to areas most suited for supporting that use, both maintenance and management responsibilities can be reduced.

Active solicitation of comments and ideas from the public regarding the trail system expansion will provide valuable input and generate a feeling of participation and pride. The park will know that all ideas have been considered, and the public will become a supportive constituency as they see their own suggestions generating or constructively modifying recreation initiatives in DWGNRA.

**8. Evaluate trails and new connections for incorporation into the formal network:**

- a. Address existing, predisposed use that is negatively impacting park resources (see page 24).
- b. Utilize trails accommodating the most visitor demands but requiring the least maintenance.

Expansion of the formal trail network should occur in stages, with the initial effort intended to include those trails with minimal maintenance or resource burdens. The preliminary repair or maintenance projects should be focused on

immediate needs such as resource damage or threats. Figure 5 describes trails with major threats. Also, see appendix A, pages A-9 through A-13, for a listing of trails judged to be best suited for immediate inclusion.

- **Indian Ladders:** Located along the steep sides of a gorge on the Pennsylvania side of the park, the trail has safety concerns ranging from bridges in need of replacement to sheer drops to the water below with guy-wires serving as railings. These are all within the realm of professional trail crews to solve. The attractiveness of the stream and falls will likely ensure that visitors remain predisposed to use of the recreation resources. Four stream bridges on the trail must be replaced or removed. Stream erosion is leading to a loss of bridge integrity. ORV use of the upper section, above the falls, is a concern. Compaction and other impacts are obvious in the Hemlock groves there.
- **Buttermilk Falls (the area immediately around the falls):** Threats to sensitive botanical features, visitor safety, and soil resources all resulting from high use on unstable terrain require attention. Again, the complexity of this work requires much thought and the skills of a professional crew. A newly installed alternative route south of the falls requires a good deal of work and does not address the visitor demand for direct access to the falls recognizable by the intense use along the edges of the falls.
- **Adam's Falls:** Two spectacular water falls attract substantial use. Steep walls of shale talus are being impacted by this use and a lack of hardened tread. Also, the work deemed appropriate for a number of stream crossing should be decided upon. Bridges will be necessarily long and, therefore, complex. Step stones seem sufficient, though they would limit accessibility to those with the ability to negotiate the crossing.
- **Van Campens Glen:** Use here is phenomenal in the summer, and a network of unconnected and interrelated social trails demonstrate the need for a well defined trail. A new trail route installed on the Hamilton Ridge Road side of Old Mine Road may modify some use in the Glen by providing an alternative return. Some tread in the lower section of the Glen needs to be made more resistant to intensive use and erosion.
- **Old Woods Road:** While use is currently low, severe gulying is occurring. Many drainages are necessary to protect the tread. The trail parallels the Appalachian Trail on the New Jersey side of the park and can accommodate a variety of use.

Figure 5. High Concern Trails in DWGNRA.

#### 9. Expand Hiking Opportunities.

- a. Utilize the existing network of informal trails and woods roads, where appropriate.
- b. Develop and promote hiking opportunities in both Pennsylvania and New Jersey which are complementary to the long hikes offered by the Appalachian Trail.
- c. Expand the opportunities for more rustic and challenging hiking experiences as options to the woods road experience, employing shelters where possible (see the recommendations for Visitor Oriented Programs).
- d. Apply the concept of thematic loop hike opportunities associated with intensively used locations such as information centers, waterfalls, picnic areas, etc.

The informal trails and woods roads provide a readily available infrastructure for broadening the recreation opportunities in DWGNRA. Introduction of new extended day hike options in both New Jersey and Pennsylvania sections of the Park will compliment the experience of the Appalachian Trail in New Jersey. In New Jersey, the Woods Road Trail, which is mostly informal, could be linked with the AT to form a long day loop. In Pennsylvania, a number of existing trails to scenic locales could be connected to form a network of trails. Pursuit of such a concept must consider road crossings and the possible danger to the hikers if these crossings are not anticipated by drivers.

The network of woods roads will serve as good primary tread, but there is a need for more challenging routes as well. New trails to some of the remote locations in the park would enhance the system's variety. For example, just southwest of Hemlock Pond in New Jersey is a rocky hill with excellent vistas that will easily support a new trail. Though the distance is not great, the additional challenge, diversity of habitats, and expansive views are worthwhile. Similarly, connecting Slateford Farms with the Appalachian Trail using one or two new trails would make use of an existing facility. Whether the current parking capacity can support an increased use beyond the service of Slateford Farms is not addressed by this report, but should be considered. There are several other undeveloped locations throughout the park which could be developed to offer challenging hiking routes.

A trail along the periphery of the park has been suggested as an option. The difficulty of traversing the park's long, narrow holdings south of Depue Island and north of the town of Delaware Water Gap makes the development of such a trail problematic. The cost here could be significant due to the restricted options for trail routing. It is recommended that any plans for a trail with this specific configuration be postponed until the initial system development has been completed.

#### **10. Expand Opportunities for Tourist Walking:**

- a. Use portions of the woods road network as self-guided nature walks.
- b. Associate short woods walks with visitor centers and other intensively used locations.

Because of the proximity to major metropolitan areas and its many attractions, DWGNRA is a very popular destination for tourists, especially during the summer months. For the many of these individuals who have spent little

time in the out-of-doors, the woods roads in DWGNRA offer an excellent introductory experience. For example, short paths and walks adjacent to visitor centers and picnic grounds can provide a reassuringly familiar experience for one who has not spent much time in a rural or forested setting.

Two locations that provide examples of such opportunities are the Blue Mountain Lakes in New Jersey and Tom's Creek in Pennsylvania. Blue Mountain Lakes currently has adequate parking and provides opportunities for leisurely walks around the shoreline, bicycling and picnicking, and could provide an area where horse riders and other users could interact. Tom's Creek has an existing picnic area and several hiking and walking opportunities. Other possibilities include Hidden Lake, Mount Minsi, and Dingman's Falls Visitor Center.

11. Pursue the concept of a multi-purpose Greenway recreation trail and consider connecting such a trail with existing campgrounds.
  - a. Utilize corridors existing along one or both sides of the Delaware River.
  - b. Incorporate existing resources where possible.
  - c. Minimize interaction with high levels of vehicular traffic.
  - d. Employ thematic development focusing on the river, plains, hills, and combinations.

A linear trail connecting communities and capable of supporting several forms of recreation is referred to as a greenway or, if located within an existing park setting, a recreation trail. Many features can be accessed with a greenway: historical, scenic, social, or cultural. The woods roads and the linear nature of the DWGNRA complement the historical and recreational features to provide an ideal location for such a trail project.

It is proposed that a multi-purpose trail be located on the New Jersey side of the Delaware, utilizing sections of Old Mine Road, Military road, and Hamilton Ridge Road, and running from the I-80 bridge at the south end of the park north to the Rt 206 bridge at Milford. The proposed route connects Worthington State Forest Campgrounds with Depew Recreation Area in DWGNRA, Millbrook Village, and an American Youth Hostel at the northern end of the Park.

It may be useful to connect the New Jersey route with a route on the Pennsylvania side of the river. A connection between Dingman's Campground, the town of Milford, and the proposed greenway on the New Jersey side of the river may be advantageous. Of concern on the Pennsylvania side of the river is the greater vehicular traffic on Rt 209, intensive

river oriented access (especially further south at Eshback and Bushkill), and the multiple intersections with other high use roads. Examples of greenways traversing such high use areas do exist, and some have been quite well received.

**12. Expand opportunities for cross-country skiing.**

Several proposals have been advanced for ski touring trails in DWGNRA. Due to the short duration of the ski season, it is wise to provide layouts that will allow the most extended season possible. By using woods roads that have few seepage problems and by avoiding any overlap with asphalt roads or asphalt bicycle paths, melting of the snow cover can be delayed.

It is recommended that designated cross-country ski trails be located away from snowmobile routes. The sound, exhaust, and speed of these vehicles can each detract from the more quiet experience of skiing. Some options for combined use may exist. While not ideal for all users, this is done successfully in other areas. Separation, if possible, is ideal overall.

- |    |  |
|----|--|
| 1. | American Youth Hostel to<br>Dingmans Ferry bridge: NJ<br>section, north. |
| 2. | Hamilton Ridge Road: NJ.   |
| 3. | The Pool Area: NJ.   |
| 4. | Blue Mountain Lakes: NJ.   |
| 5. | Mount Minsi Fire Road: PA.   |

Figure 6. Possible Ski Touring Trail Locations

**13. Promote both road and trail bicycling.**

Bicycling is a nationally popular activity and DWGNRA's woods roads provide a resource capable of offering both road and trail bicycling experiences. Maintenance demands for bicycle trails differ from those of hiking trails. The single-wheeled track caused by a bicycle traveling across wet soil can leave the rudimentary beginnings of a gully, and potential erosion problems must be properly anticipated during the design and construction phase of the trail. Also, problems with tread wear resulting from acceleration or deceleration should be expected. Tread with the best potential for supporting bicycle use will be well drained, hardened where erosion is a concern, and appealing to those wishing to ride. Particular

areas sensitive to erosion may benefit from seasonal restrictions on bicycle use to limit traffic during wet periods if the use is frequent enough to warrant concern.

Cultivation of an attitude of stewardship within the bicycling community will generate an actively involved public. With an enthusiastic welcoming of the use, bike shops and bicycle owners can become energetic volunteer trail maintainers in DWGNRA just as they have elsewhere.

To ensure rider safety, it is recommended that shoulders along stretches of road between popular bicycle paths be improved. Heavily trafficked roads such as PA 209 and NJ 615 should not be recommended as bicycle routes without such improvements.

#### 14. Integrate equestrian use.

Horseback riding in DWGNRA is currently increasing in popularity. Several large stables are maintained on the immediate perimeter of DWGNRA, and the few special-event rides in the park have been well received by participants. Pressure is mounting to expand the opportunities for horseback riding. This expansion will add to the recreation opportunities at DWGNRA.

Horse trails can easily be established in the park because there are old roadbeds capable of supporting heavy horse traffic, naturally hardened sections of tread, existing stables nearby, and interested organized horse groups. Three key limiting-factors are the steep walled ravines with often unstable shale slopes, narrow roads with high levels of automobile traffic, and soil that is susceptible to compaction and erosion. Areas of exposed bedrock beyond a certain angle or of certain compositions can be difficult for shod horses to negotiate.

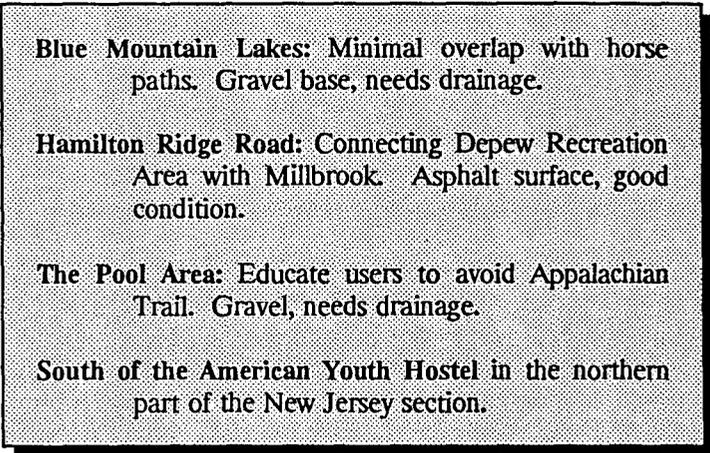


Figure 7. Potential Bicycling Sites

The careful introduction of equestrian use is necessary to ensure that the locations most suitable for horse traffic are sufficiently hardened to support the inherent impact. It is crucial that the tread can be well maintained to protect resources such as soil and water. The consideration of visitor safety issues must also be reflected in equestrian trail development efforts. It is recommended that equestrian routes avoid crossing major roads or heavily traveled secondary roads.

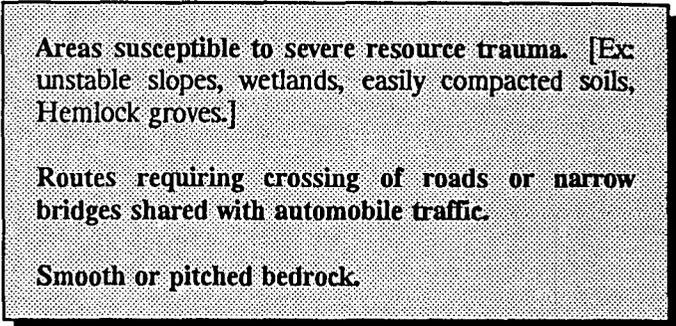


Figure 8. Recommended Areas to Avoid with Equestrian Use

Two regions of DWGNRA seem to offer the best opportunities for initial horse trail development. A sizable network of trails could be developed between Millbrook Village, NJ, and the Walpack Wildlife Management Area to the south. Centered around the roads remaining at Blue Mountain Lakes, these trails would cross a minimum of active roads while offering an extended riding experience. Unfortunately, continuing further north may lead to safety concerns due to the existing overlap on the narrow bridge and road which access the popular Buttermilk Falls and Hidden Falls.

In Pennsylvania the Hogsback is another recommended region. With the predominance of naturally hardened surfaces, access from Bushkill, and the mix of riverside and uplands, riders should enjoy the trails while the use should require a minimum of maintenance attention once several specific sections are hardened. A significant concern regarding any designated non-pedestrian use (e.g., horses, bicycles, or ORV/ATV) in this area, though, is the existence of endangered plants, especially wetland varieties, and animals, including migratory. Due to user group conflicts, established ORV use may have to be eliminated should this option for introducing horse use be pursued.

A third area capable of supporting horse use is centered around Hidden Lake and can be associated with the Shawnee stables and Monroe County Riders in Pennsylvania. Concerns about the stability of the soils in sections of the proposed loop, especially around the perimeter of several fields need to be addressed. Hardening and draining the tread will help. The proposed route overlaps or crosses town roads in five locations. A portion of the proposed loop was included in the inventory and work logs of this report (summarized in Appendix A).

The Woods Road Trail in New Jersey has been referenced in the 1987 General Management Plan as an option for horse use. This proposal includes use of the Hidden Falls Trail by horses. **Horse use on the Woods Road Trail is not recommended for the following reasons:**

- (1) the trail traverses several beaver dams and wet soils that will not sustain horse traffic;
- (2) the trail's northern terminus is the Appalachian Trail, which currently should not have such use directed to it;
- (3) soft soils caused by the number of water sources found along the length of the road indicate that the tread will be damaged by heavy equestrian use; and,
- (4) Hidden Falls Trail is steep and contains little hardened road surface.

Solicitation by the Park Service of organized groups and individual volunteers willing to assist in the maintenance of horse trails is recommended. This will provide a means to accomplish necessary seasonal maintenance while allowing the users to personally invest in the trails. Brushing of horse trails by those who ride horse will help to accurately gauge the proper height and width. Participation of riders in active stewardship of the trails will promote responsibility, enthusiasm, and pride.

#### **15. Integrate snowmobile use.**

The 1987 General Management Plan indicates that snowmobiles are an appropriate recreational endeavor for the trail system within DWGNRA. This use is occurring during the winter months when snowfall is adequate. Potential visitor conflicts must be avoided where possible. Examples include conflicts between snowmobiles and horses, cross-country skiers, and others who are pursuing a more quiet interaction with nature. Natural resource threats also must be avoided. Examples include compaction of moist soils, damage to plants, and animal disturbances or harassment.

## **16. Address Off-Road Vehicle Use (ATV and ORV).**

All-terrain-vehicle (ATV) and off-road-vehicle (ORV) use is an issue of concern to managers and visitors alike. It is a popular activity, and there are sections of DWGNRA probably capable of supporting such use with a minimum of social or environmental impact. Designation of selected areas of the Hogsback as appropriate for ORV use, and actively managed as such, would probably be well received by those who pursue such activities. Concentration of use would also mitigate conflicts between user groups. The potential threats to wildlife habitat, disturbance of nesting sites, and other management issues of this type will need to be addressed.

Unfortunately, considerable damage can be done with only a few vehicles. There are several areas managed by the state of Pennsylvania which may be more appropriate as options for the use of ORV's. A program of user information and education should be initiated regardless of the policies in DWGNRA. By notifying the public that ORV use is, or is not, acceptable, the management burden will be reduced. Even with a campaign to inform the public enforcement of regulations will continue to be necessary. Cooperation with the State of Pennsylvania on this matter will be crucial should redirection of the activity become policy.

## **17. Increase backcountry camping opportunities.**

Backcountry camping is presently permitted along the Delaware River and Appalachian Trail. We recommend that backcountry camping also be extended to designated locations along other hiking trails. In this section we have included our recommendations regarding appropriate management goals, policies, and objectives to guide backcountry camping policies, visitor regulations, and visitor educational efforts.

Information regarding current camping regulations may be found in the following documents: Delaware Water Gap, River Camping Policy; Appalachian Trail, Governing Regulations; and in the DWGNRA Resource Management Plan, Project Statement on Campsite Management (DEWA-16). In accordance with the management policies presented in these documents we formulated draft management goals and objectives for consideration in guiding backcountry camping along trails (Appendix C).

In keeping with the General Management Plan, backcountry camping is intended for visitors who are on extended trips in the park's backcountry. Therefore, we recommend that camping be restricted to visitors on extended hiking trips and limited to one night stay per site. Impacts to the resources are also of paramount concern. Research by Cole and Marion (1987) and Marion (1988) at DWGNRA has shown that designated rather than dispersed camping is a more effective strategy for minimizing resource impacts. This research also provides information which may be used to select impact resistant campsites and to devise monitoring systems.

Campsites should be located in the more remote areas of the park, preferably more than one-half mile from developed areas, roads or park boundaries.

Park management will also wish to carefully consider issues such as campsite group size restrictions, campfires, human waste disposal, and camping with horses. A group size restriction to 10 persons has been effective in other areas in minimizing resource damage; some group campsites might be provided for larger groups. Campfires might be permitted if steel firegrates were provided as they are in campsites along the river. Similarly, fiberglass pit latrines might be provided, as for some river campsites, or campers could be directed to bury fecal material, as along the Appalachian Trail. Finally, studies have shown that considerable resource damage is possible when camping occurs with horses. Additional facilities, regulations, and monitoring measures should be considered if this type of use is permitted.

An alternate, more "developed" arrangement of backcountry facilities might also be considered. For example, three-sided Adirondak shelter sites with composting toilets might be considered. Such facilities would require additional maintenance and management to process sewage, operate the site, and provide the public with information and direction. The AMC has successfully operated about two-dozen sites with use levels ranging from 10-25 people per day. Most of

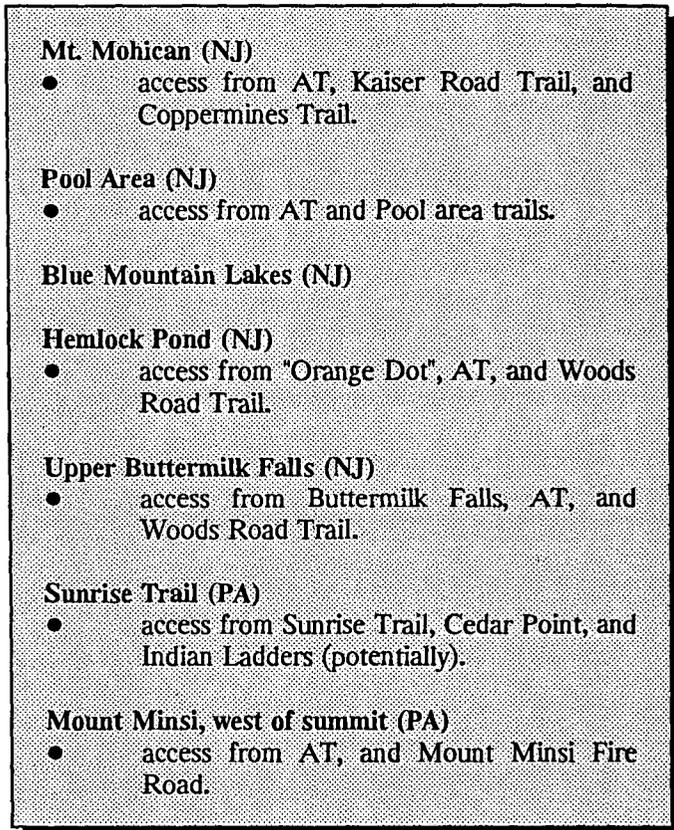


Figure 9. Possible General Locations for Backcountry Campsites.

these sites are unattended except for maintenance done on a rotating basis. For additional information on this topic we recommend the book "Backcountry Facilities: Design and Maintenance" (Leonard, Spencer and Plumley n.d.).

#### **18. Improve facilities.**

Improvements in placement, signing, and design of parking areas in DWGNRA are necessary to accommodate an expanded trail system. Several existing lots are located such that they require dangerous road crossings for visitors, had unsafe entrances and exits, or had narrow access drives. In expanding trailhead parking, an attempt must be made to separate short-term lots from longer-term lots. For instance, day-hikers will reduce the parking available to those short-term visitors interested in a scenic location or visitor center, and vice-versa. Also, some trails will benefit from a smaller lot at the trailhead to effectively reduce use of the trail, but larger lots will be necessary where a network of routes can be accessed. Visitor facilities such as trash receptacles, water sources, and restrooms may also be appropriate.

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## Appendix A

### Prescriptive Trail Work Log Summaries

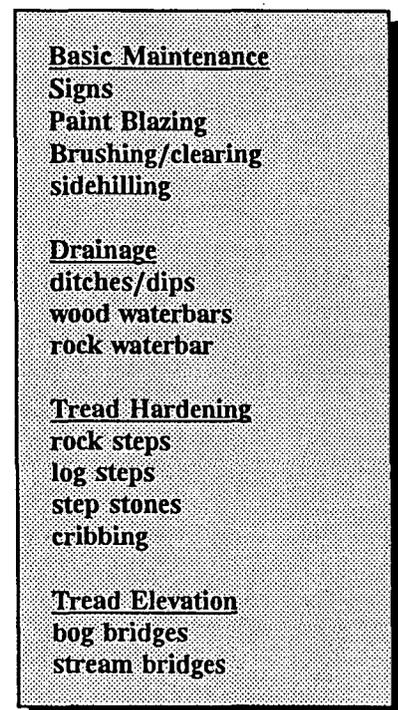


## Introduction

Prescriptive trail work logs describe trails in two ways. First, figures are used to indicate how much of what type of work should be done at what location. These figures can be tallied for each trail, region, or for the park as a whole. The second representation is more general, as the comments within the work log and the implications of the figures are used to categorize the trail according to seven basic criteria, each described separately on the pages that follow.

The trail work logs developed in DWGNRA and Worthington State Forest were reviewed and summarized to provide a thorough, brief synopsis. Most work log formats allow the maintenance needs of a trail to be tabulated easily. This allows the project's scope to be estimated. In general, four categories of trail work were found in the DWGNRA: basic maintenance items, tread drainage items, tread hardening items, and tread elevation items (see Figure A-10). Within each category Specific types of tread work are associated with. Work may be installed to minimize resource damage, to repair existing damage, or to minimize relevant issues of visitor safety. Further explanation of the work items and their uses can be found in Trail Building and Maintenance, 2nd Edition (Proudman and Rajala, 1981).

Figures compiled in the work logs are available in a computer database that will be submitted on magnetic media with this report. The data can then be manipulated by DWGNRA staff as needed.



<u>Basic Maintenance</u> Signs Paint Blazing Brushing/clearing sidehilling
<u>Drainage</u> ditches/dips wood waterbars rock waterbar
<u>Tread Hardening</u> rock steps log steps step stones cribbing
<u>Tread Elevation</u> bog bridges stream bridges

Figure A-1. Trail work items referenced in this report.

## Synopsis Format

To facilitate critical discussion of the AMC's recommendations, each trail synopsis is presented on a single page divided into five regions. The first few lines of information are quite basic. The top of the page, beneath the heading **DWGNRA Trail Work Log Synopsis**, is a trail name. Common names are used when they are known. To the far right is the computer-file name assigned to the prescriptive work log file for that trail. The length of the trail is listed below the trail name. Next, the stage at which the AMC recommends incorporating the trail into the DWGNRA trail system is recorded. Management review among the DWGNRA staff and public review will reevaluate this preliminary proposal and determine a final set of trails to be incorporated into the DWGNRA trail system during specific periods. The final piece of information found at the top of each synopsis is a listing of the local park area associated with each particular trail. To explain how figures were determined and characteristics assigned, certain parts of the synopsis are described here.

### 1. Difficulty

Trails were rated on a four level scale of difficulty. At the one end of the scale are trails likely to represent no real difficulty for a high percentage of visitors. These trails were rated as having a difficulty of "None". The next level of difficulty was generally categorized as "Low", followed by "Moderate", and then by "High". The categories are determined by review of the work logs, and are expected to be modified by those more familiar with the trail users of DWGNRA.

### 2. Existing Type of Use

Six possible categories of use-type were used to define trails surveyed in this project. They are: 1) hiking, 2) biking, 3) skiing, 4) horse, 5) snowmobile, and 6) multiple. Determination of type is based on indications appearing on the trail tread the day that the work log was compiled. No long-term study of the type of use for each trail was conducted.

### 3. Existing Level of Use

Current levels of existing use are indicated by wear on a trail tread, and should be useful for determining the appropriate response. Categories used to indicate the level of use are: 1) **low**, 2) **moderate**, 3) **high**, and 4) **intensive**. Intensive use refers to areas which see inordinate concentration of use, often as a result of an attraction such as a visitor center or a spectacular waterfall. The levels within this category were assigned on the basis of the field survey work done for this report. No scientific study was employed. Results of future studies, however, may be incorporated into the format of these synopsis.

### 4. Recommended Type of Use

Informal review of a trail tread's soil composition, the trail's role within the park, and the existence of sensitive areas or safety concerns allows one to make recommendations pertaining to the type of use best suited for the trail as well as the goal of a diverse trail system serving the needs of visitors seeking a variety of experiences.

The six categories of use applicable under the rubric "existing type of use" were again used here:

1) **hiking** , 2) **biking** , 3) **skiing** , 4) **horse** , 5) **snowmobile** , and 6) **multiple**.

In addition the categories of 7) **intensive use** , and 8) **undeveloped** were pertinent to the options in DWGNRA.

### 5. Expected Maintenance Level

Soil composition and the recommended type of use allow the anticipated level of maintenance to be determined. Three levels of expected maintenance are applicable in the DWGNRA: 1) **low**, 2) **moderate**, and 3) **high**.

The estimates of this report are predicated on the existence of basic annual maintenance efforts and do not include the basic work such as signing, paint blazing, or brush clearing required to prepare trails for inclusion in the park's official trail system, nor to prepare trails for types or levels of use that differ from those assumed during the work log development. A lack of annual maintenance can increase future heavy-maintenance levels significantly.

## 6. Sensitive areas

Sensitivity of plants, soils, or animals to use or types of use is an issue which should be included in the planning process for a trail system. It is anticipated that the information within this category will be modified by DWGNRA Resource Management Staff who are more familiar with the specifics of these criteria.

## 7. Safety

Safety concerns referenced in the work logs and documented in this report do not necessarily exist. Instead they are often referenced to highlight a concern that ought to be addressed as both maintenance and management of the recreation resource is planned. Such concerns are reference with either a yes or a no for the trail as a whole. An explanation is often offered in the comment component of each trail summary. The full context of each specific concern is found in the work logs.

## 8. Estimated Days of Labor

Planning for trail work projects often requires an estimation of the amount of time a given trails project may necessitate to complete. To complete such estimates for the trail work necessary in the DWGNRA, the *Maintenance Figures* compiled from the prescriptive work logs were converted to *Estimated Days of Labor*. To do this, the total amount of units or feet needed within each category of trail work was multiplying by a conversion factor (see Table A-I). The AMC selected the appropriate conversion factor by reviewing the records of several years of trail work completed by their trail crews throughout the Northeast. The estimate includes a "Low" value and a "High" value, indicating a likely range of time that might be required to complete the work. For example, the estimate of the labor required to install Rock Steps on a trail is based on AMC records indicating that three to four Rock Steps are commonly installed by a person in a day. Since installing four rocks a day will reduce the amount of time necessary to complete an installation, multiplying the number of steps by a conversion factor of (units/4) provides an estimate of the least amount of time normally required to install that number of rock steps. This estimate is the figure in the "Low" column of the trail

summaries. When units of a trail-maintenance-item commonly differ in length, a conversion factor based on the total number of feet of that item was selected and a similar process completed.

**Table A-I: Conversion factors applied to estimate the labor required to complete recommended trail work in DWGNRA.**

<u>Maintenance Figures</u> <u>(Pertinent data)</u>			<u>Estimated Days of Labor</u> <u>(Conversion factor)</u>	
Item	Total Feet	Units	Low	High
Rock Steps		x	units/4	units/3
Log Steps		x	units/6	units/4
Step-stones		x	units/5	units/4
Ditching	x		feet/50	feet/40
Wood Water Bar	x		feet/40	feet/30
Rock Water Bar	x		feet/20	feet/10
Cribbing	x		feet/20	feet/10
Stream Bridge	x		feet/1.65	feet/1.32
Bog Bridge	x		feet/35	feet/25
Sidehilling	x		feet/100	feet/80
<b>Estimates of Total Labor Required:</b>			Sum column	Sum column

Using the computer database, the information and categories which define a trail can be used to sort the trail work logs in many useful ways. The ability to present the trails in multiple ways allows the system to be viewed from many perspectives. For example, the trails might be listed according to estimated work needs, a factor on which cost is dependent. Or the trails could be listed by use characteristics, or by difficulty.

**Proposed DWGNRA Trail System**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

Number of Trails Surveyed: 39  
 Total Length: 58.17

<u>General Characteristics</u>	<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
Not Applicable in Summary Section.	Item	Total Feet	Units	Low	High
Difficulty:	Rock Steps	n/a	322	80.50	107.35
Existing Use:	Log Steps	n/a	360	60.00	90.00
Level of Use:	Step-stones	n/a	536	107.20	134.00
Recommended Use:	Ditching	5572	313	111.44	139.39
Expected Level of Maintenance:	Wood Water Bar	2160	165	54.07	71.99
Sensitive Areas?:	Rock Water Bar	421	42	21.05	42.10
Potential Safety Concerns?:	Cribbing	565	11	28.25	56.50
	Stream Bridge	156	6	94.54	118.17
	Bog Bridge	509	63	14.55	20.36
	Sidehilling	3266	n/a	32.66	40.85
	<b>Estimates of Total Labor Required:</b>			<b>604.26</b>	<b>820.71</b>

**Proposed DWGNRA Trail System**  
**Worthington State Forest, N.J.**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

**Number of Trails Surveyed: 16**  
**Total Length: 18.49**

<b><u>General Characteristics</u></b>	<b><u>Maintenance Figures</u></b>		<b><u>Estimated Days of Labor</u></b>		
	<b>Item</b>	<b>Total Feet</b>	<b>Units</b>	<b>Low</b>	<b>High</b>
Not Applicable in Summary Section:					
<b>Difficulty:</b>	Rock Steps	n/a	112	28.00	37.33
<b>Existing Use:</b>	Log Steps	n/a	13	2.16	3.25
<b>Level of Use:</b>	Step-stones	n/a	91	18.20	22.75
<b>Recommended Use:</b>	Ditching	5038	293	100.76	126.00
<b>Expected Level of Maintenance:</b>	Wood Water Bar	474	40	11.88	15.79
<b>Sensitive Areas?:</b>	Rock Water Bar	488	31	24.40	48.80
<b>Potential Safety Concerns?:</b>	Cribbing	690	n/a	34.50	69.00
	Stream Bridge	81	3	49.09	61.36
	Bog Bridge	35	4	1.00	1.40
	Sidehilling	35	n/a	0.35	0.44
<b>Estimates of Total Labor Required:</b>				<b>270.34</b>	<b>386.12</b>

**Note:**  
The summaries of these trails include a 1x and 2x convention for the Stage to Incorporate into Trail System. This is to distinguish DWGNRA trails from Worthington State Forest trails.

**Proposed DWGNRA Trail System**  
**Proposed Incorporation Stage 1**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

Number of Trails Surveyed: 22  
 Total Length: 35.72

General Characteristics

Maintenance Figures

Estimated Days of Labor

Not Applicable in  
 Summary Section.

Difficulty:

Existing Use:

Level of Use:

Recommended Use:

Expected Level of  
 Maintenance:

Sensitive Areas?:

Potential Safety  
 Concerns?:

Item	Total Feet	Units	Low	High
Rock Steps	n/a	202	50.50	67.35
Log Steps	n/a	257	42.83	64.25
Step-stones	n/a	384	76.80	96.00
Ditching	2616	181	52.32	65.36
Wood Water Bar	761	83	19.06	25.37
Rock Water Bar	305	34	15.25	30.50
Cribbing	475	9	23.75	47.50
Stream Bridge	85	3	51.51	64.39
Bog Bridge	159	19	4.55	6.36
Sidehilling	1443	n/a	14.43	18.06
<b>Estimates of Total Labor Required:</b>			<b>351.00</b>	<b>485.14</b>

**Trails:**

A.T.: Buttermilk Falls to Hidden Falls  
 A.T.: Blairstown Road To Mohican  
 A.T.: Coppermines To Kaiser Rd  
 A.T.: Crater Lake To Buttermilk  
 A.T.: Hidden Falls To Old Woods Rd  
 Buttermilk Falls (Falls Area)  
 Buttermilk Falls (Above Falls)  
 Coppermines Trail  
 Fossil Trail  
 Hemlock Pond Trail (Orange Dot)  
 Hemlock Pond Woods Road

Hidden Lake (PA)  
 Indian Ladders  
 Kaiser Road Trail  
 Mount Minsi Trail  
 Orchard/Mccool Trail  
 Rattlesnake Swamp Trail  
 Sunrise Trail  
 Tom's Creek Trail  
 Tumbling Waters (Lower End)  
 Tumbling Waters (Main Loop)  
 Van Campen's Glen Trail

**Proposed DWGNRA Trail System**  
**Proposed Incorporation Stage 2**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

**Number of Trails Surveyed: 11**  
**Total Length: 16.45**

<u>General Characteristics</u>	<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
	Item	Total Feet	Units	Low	High
Not Applicable in Summary Section.					
Difficulty:	Rock Steps	n/a	48	12.00	16.00
Existing Use:	Log Steps	n/a	64	10.67	16.00
Level of Use:	Step-stones	n/a	131	26.20	32.75
Recommended Use:	Ditching	1781	85	35.62	44.55
Expected Level of Maintenance:	Wood Water Bar	1344	76	33.63	44.79
Sensitive Areas?:	Rock Water Bar	96	7	4.80	9.60
Potential Safety Concerns?:	Cribbing	75	1	3.75	7.50
	Stream Bridge	56	2	33.94	42.42
	Bog Bridge	350	44	10.00	14.00
	Sidehilling	408	n/a	4.08	5.10
	<b>Estimates of Total Labor Required:</b>			<b>174.69</b>	<b>232.71</b>

<b>Trails:</b>	
Adam's Creek	Old Woods Road: Between Hidden Falls sections
Blue Mountain Lakes	Old Woods Road: Northern End
Hamilton Ridge (Old Military Road To Pioneer Trail)	Pioneer Trail
Hidden Falls Trail (Upper)	Thunder Mountain (Military Road Loop)
Hidden Falls (Lower)	Upper Hidden Falls Trail
Old Woods Road: South End	

**Proposed DWGNRA Trail System**  
**Proposed Incorporation Stage 3**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

Number of Trails Surveyed: 6  
 Total Length: 6.00

<u>General Characteristics</u>	<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
Not Applicable in Summary Section.	Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	Rock Steps	n/a	72	18.00	24.00
<b>Existing Use:</b>	Log Steps	n/a	39	6.50	9.75
<b>Level of Use:</b>	Step-stones	n/a	21	4.20	5.25
<b>Recommended Use:</b>	Ditching	1175	47	23.50	29.38
<b>Expected Level of Maintenance:</b>	Wood Water Bar	55	6	1.38	1.83
<b>Sensitive Areas?:</b>	Rock Water Bar	20	1	1.00	2.00
<b>Potential Safety Concerns?:</b>	Cribbing	15	1	0.75	1.50
	Stream Bridge	15	1	9.09	11.36
	Bog Bridge	0	0	0.00	0.00
	Sidehilling	1415	n/a	14.15	17.69
	<b>Estimates of Total Labor Required:</b>			<b>78.57</b>	<b>102.76</b>
<b>Trails:</b> Cedar Point Trail Child's To Dingman's: Proposed N.J. District Ranger House to Thunder Mountain Pool Area Shawnee Horse Trail (Proposed) Wood Road at Upper Pioneer					

**Proposed DWGNRA Trail System**  
**Worthington State Forest, N.J.**  
**Proposed Incorporation Stage 1**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

**Number of Trails Surveyed: 14**  
**Total Length: 17.00**

<u>General Characteristics</u>	<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
Not Applicable in Summary Section.	Item	Total Feet	Units	Low	High
Difficulty:	Rock Steps	n/a	112	28.00	37.33
Existing Use:	Log Steps	n/a	13	2.16	3.25
Level of Use:	Step-stones	n/a	53	10.60	13.25
Recommended Use:	Ditching	4635	272	92.70	115.92
Expected Level of Maintenance:	Wood Water Bar	474	40	11.88	15.79
Sensitive Areas?:	Rock Water Bar	473	31	23.65	47.30
Potential Safety Concerns?:	Cribbing	690	n/a	34.50	69.00
	Stream Bridge	81	3	49.09	61.36
	Bog Bridge	35	4	1.00	1.40
	Sidehilling	35	n/a	0.35	0.44
	<b>Estimates of Total Labor Required:</b>			<b>253.93</b>	<b>365.04</b>

<b>Trails:</b>	
A.T.: Douglas To Garvey Springs	Dunnfield Creek (Upper)
A.T.: I-80 To Beulahland Trail	Dunnfield/I-80 Link
Beulahland Trail	Garvey Springs Trail (Lower)
Blue Dot	Holly Spring Trail
Bluff Road Trail	Mount Tammany: Dunnfield Lot to Overlook
Douglas Trail (Worthington State Park)	Northwest Trail (Worthington State Park)
Dunnfield Creek Drainage Trail	

**Proposed DWGNRA Trail System**  
**Worthington State Forest, N.J.**  
**Proposed Incorporation Stage 2**  
**Summary Figures and Synopsis from Comprehensive Work Logs**

**Number of Trails Surveyed: 2**  
**Total Length: 1.49**

<u>General Characteristics</u>	<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
Not Applicable in Summary Section.	Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	Step-stones	n/a	38	7.60	9.50
<b>Recommended Use:</b>	Ditching	403	21	8.06	10.08
<b>Expected Level of Maintenance:</b>	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	Rock Water Bar	15	1	0.75	1.50
<b>Potential Safety Concerns?:</b>	Cribbing	0	n/a	0.00	0.00
	Stream Bridge	0	0	0.00	0.00
	Bog Bridge	0	0	0.00	0.00
	Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>				<b>16.41</b>	<b>21.08</b>
<b>Trails:</b>					
Garvey Connector (Proposed)			Dunnfield Creek (Upper)		

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: Backpacker #2 to Beulahland Trail  
 Length: 1.64  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *at\_bkpk2.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	high	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	409	28	8.18	10.23
Expected Level of Maintenance:	moderate	Wood Water Bar	33	2	0.83	1.10
Sensitive Areas?:	No	Rock Water Bar	35	2	1.75	3.50
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>10.76</b>	<b>14.83</b>

**Comment:**

One of the more gullied sections of the AT in the DWG area. Needs lengthy drainage installation. Once required work is installed, most maintenance should be seasonal cleaning.

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: Blirstown Road To Mohican  
 Length: 3.39  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Appalachian Trail

Filename: *at\_blair.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	20	5.00	6.67
Existing Use:	hiking	Log Steps	n/a	18	3.00	4.50
Level of Use:	moderate	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	45	7	0.90	1.13
Expected Level of Maintenance:	low	Wood Water Bar	129	17	3.23	4.30
Sensitive Areas?:	No	Rock Water Bar	41	6	2.05	4.10
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>14.18</b>	<b>20.70</b>

**Comment:**  
 Greatest needs are brushing and blazing, especially around the repeater tower and some of the overlooks.

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: Buttermilk Falls to Hidden Falls  
 Length: 1.37  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Hidden Falls/Buttermilk Falls

Filename: *at\_butte.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	3	0.75	1.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	3	1	0.06	0.08
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	12	2	0.30	0.40
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>1.11</b>	<b>1.48</b>

**Comment:**  
 A good, short, stable section of trail.

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: Coppermines To Kaiser Rd  
 Length: 1.96  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Kaiser Road/Coppermines

Filename: *at\_kaisr.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	4	1.00	1.33
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	10	2	0.20	0.25
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>1.20</b>	<b>1.58</b>

**Comment:**

A good section of trail requiring little work other than seasonal maintenance. Connects Coppermines Trail with Kaiser Road Trail to make a day hike.

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: Crater Lake To Buttermilk  
 Length: 0.91  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Appalachian Trail

Filename: *at\_hemlk.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	205	9	4.10	5.13
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>4.10</b>	<b>5.13</b>

**Comment:**  
 There are several potential backcountry campsite locations along this section of trail. An information and education campaign aimed at eliminating bicycle and horse use from the AT may need to be considered if these uses are directed towards the Crater Lake roads.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** A.T.: Douglas To Garvey Springs  
**Length:** 1.42  
**Stage to Incorporate into Trail System:** 1x  
**Local Park Area:** Worthington

**Filename:** *at\_doug.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	4	1.00	1.33
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	high	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	159	13	3.18	3.98
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>4.18</b>	<b>5.31</b>

**Comment:**

A very highly used section due to traffic headed for AT, Sunfish Pond, good day loops, and the beautiful setting. Resource damage results from the tread being located too close to the shore of Sunfish pond in several spots. Rocks along the N. end of the pond are incredible.

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: Hidden Falls To Old Woods Rd  
 Length: 1.27  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Appalachian Trail

Filename: *at\_hifa.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	low	Step-stones	n/a	10	2.00	2.50
<b>Recommended Use:</b>	hiking	Ditching	77	3	1.54	1.93
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	57	9	1.43	1.90
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	20	1	12.12	15.15
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>17.09</b>	<b>21.48</b>

**Comment:**

Trail's location makes it more rustic than most in DWGNRA. Access from the perimeter of the park may require monitoring or management of existing camp sites. The route could be incorporated into a day-hike in conjunction with the Buttermilk Falls and Hidden Falls trails. The stream crossings and other upgrades may not be appropriate for a rustic trail, but should be installed if more general use is promoted. Sensitive areas are associated with camp sites and trail erosion. Safety hazard is associated with a stream crossing that might benefit from a stream bridge.

**DWGNRA Trail Work Log Synopsis**

Trail name: A.T.: I-80 To Beulahland Trail  
 Length: 1.49  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Dunnfield

Filename: *at\_180log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	high	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	678	42	13.56	16.95
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	57	4	1.43	1.90
<b>Sensitive Areas?:</b>	No	Rock Water Bar	15	1	0.75	1.50
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	600	0	30.00	60.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>45.74</b>	<b>80.35</b>

**Comment:**  
 Safety concerns resulting from metal posts and bars sticking up from existing cribbing along lower section of trail. Very high level of day-use is due to easy access from I-80.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Adam's Creek  
**Length:** 0.93  
**Stage to Incorporate into Trail System:** 2  
**Local Park Area:** Adams Creek

**Filename:** adamcrk.log

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	43	10.75	14.33
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	32	6.40	8.00
<b>Recommended Use:</b>	hiking	Ditching	6	1	0.12	0.15
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	16	2	0.40	0.53
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	75	1	3.75	7.50
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>21.42</b>	<b>30.51</b>

**Comment:**

Adam's Creek has several stream crossings. These will be difficult to bridge because of width. The streams are shallow, except in flood. SS or nothing should be sufficient. Beyond the upper falls is a mill. A number of options are present for connecting the current trail with the mill area. Additional field trips will be necessary to determine the preferred route. It is recommended that the south bank be used for accessing the mill. The north is steep and has more obstacles. Management decisions concerning use, type of use, local loop hikes, etc. should be made prior to the installation of this route.

**DWGNRA Trail Work Log Synopsis**

Trail name: Beulahland Trail  
 Length: 1.30  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *beulah.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	15	3.75	5.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	541	34	10.82	13.53
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	39	4	0.98	1.30
<b>Sensitive Areas?:</b>	No	Rock Water Bar	82	6	4.10	8.20
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>19.65</b>	<b>28.03</b>

**Comment:**

Large, unpaved parking-lot at bottom of trail, access to AT, and a loop with Karamack Trail suggest that this trail will be useful in any DWG trail system. Greatest need is drainage.

**DWGNRA Trail Work Log Synopsis**

Trail name: Blue Dot  
 Length: 1.79  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Mt. Tammany

Filename: *bluedot.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	2	0.33	0.50
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	131	6	2.62	3.28
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	160	10	4.00	5.33
<b>Sensitive Areas?:</b>	No	Rock Water Bar	188	11	9.40	18.80
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>16.35</b>	<b>27.91</b>

**Comment:**

Provides good loop with AT/Dunnfield Creek and Red Dot. Portion of Dunnfield Creek Trail was logged as part of this trail (from A.T. N. to Blue Dot). Needs drainage, but otherwise in very good shape. If this trail is blazed according to A.T. format, it would not be blazed blue. If this is the case, the name may no longer apply.

**DWGNRA Trail Work Log Synopsis**

Trail name: Blue Mountain Lakes  
 Length: 4.87  
 Stage to Incorporate into Trail System: 2  
 Local Park Area: Blue Mtn Lakes

Filename: *bluemtlk.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	multiple	Log Steps	n/a	28	4.67	7.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	multiple	Ditching	325	16	6.50	8.13
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	995	51	24.88	33.17
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	53	n/a	0.53	0.66
<b>Estimates of Total Labor Required:</b>					<b>36.58</b>	<b>48.96</b>

**Comment:**

A number of uses can be accommodated in this area with little conflict if an effort is made to both separate uses and educate the visitors to expect a variety of uses. The tread does need to be hardened and drained in a number of spots. There are opportunities for installing hiking loops to some of the outlooks that are currently not reached by existing woodsroads.

**DWGNRA Trail Work Log Synopsis**

Trail name: Bluff Road Trail  
 Length: 1.63  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *bluffrd.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	moderate	Rock Steps	n/a	0	0.00	0.00
Existing Use:	multiple	Log Steps	n/a	0	0.00	0.00
Level of Use:	low	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	313	22	6.26	7.83
Expected Level of Maintenance:	moderate	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	No	Rock Water Bar	20	1	1.00	2.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>7.26</b>	<b>9.83</b>

**Comment:**  
 A nice, gentle path in the woods. Needs drainage.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Buttermilk Falls (Falls Area)  
**Length:** 0.11  
**Stage to Incorporate into Trail System:** 1  
**Local Park Area:** Hidden Falls/Buttermilk Falls

**Filename:** b-mlkfls.log

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	53	13.25	17.67
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	intensive	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	0	0	0.00	0.00
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	80	2	4.00	8.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>17.25</b>	<b>25.67</b>

**Comment:**

Intensive use occurring besides the Falls as people climb to the top should be accomodated. In addition to the referenced work, a railing or low rock wall will be needed to guide visitors along the prefered route. Plant colonies (some considered R&E: see DWGNRA Division of Resource Management) in the spray area of the falls require protection. Safety issues result from the potential of visitors falling while climbing to the upper falls unless carefully guided with a high-standard foot path coupled with warnings of possible dangers. A mid-falls viewing area with very high standard access from below and distinguished from the more challenging route that continues to the top is the best design option.

The existing blue blazed trail to the top of the falls provides a nice short walk for visitors, but fails to address the need for proximal access to the falls. Work is needed on that trail to alleviate resource damage there.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Buttermilk Falls (Above Falls)  
**Length:** 1.51  
**Stage to Incorporate into Trail System:** 1  
**Local Park Area:** Hidden Falls/Buttermilk Falls

**Filename:** *uprbtmlk.log*

**General Characteristics**

**Maintenance Figures**

**Estimated Days of Labor**

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	20	5.00	6.67
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	34	9	0.68	0.85
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	72	9	1.80	2.40
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	84	12	4.20	8.40
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>11.68</b>	<b>18.32</b>

**Comment:**  
 Upper part of the trail is very durable. See comments concerning the Falls area.

**DWGNRA Trail Work Log Synopsis**

Trail name: Cedar Point Trail  
 Length: 0.25  
 Stage to Incorporate into Trail System: 3  
 Local Park Area: Indian Ladders/PEEC

Filename: *cedarpt.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
Difficulty:	moderate	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	low	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	0	0	0.00	0.00
Expected Level of Maintenance:	high	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	Yes	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>0.00</b>	<b>0.00</b>

**Comment:**  
 This trail should be relocated for its entire length. Good existing parking options and trail access to the PEEC trails without impacting PEEC's parking requirements makes this trail useful within the DWGNRA trail system. Current tread begins in a dumping area that should be cleaned up if possible. The trail should also begin at a new location. See the work log.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Child's To Dingman's: Proposed  
**Length:** 2.15  
**Stage to Incorporate into Trail System:** 3  
**Local Park Area:** Child's Park/Dingman's

**Filename:** *childprk.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	67	16.75	22.33
<b>Existing Use:</b>	hiking	Log Steps	n/a	39	6.50	9.75
<b>Level of Use:</b>	moderate	Step-stones	n/a	21	4.20	5.25
<b>Recommended Use:</b>	hiking	Ditching	30	3	0.60	0.75
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	45	4	1.13	1.50
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	15	1	0.75	1.50
		Stream Bridge	15	1	9.09	11.36
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	1415	n/a	14.15	17.69
<b>Estimates of Total Labor Required:</b>					<b>53.17</b>	<b>70.13</b>

**Comment:**

A proposed trail that will expand the diversity of options available to visitors in the Child's Park and Dingman's Falls areas. A potential conflict may exist between expectations of users in the high-standard areas of Child's and Dingman's and the likely standard of this proposed tread. This possible conflict can be mitigated through the use of informational signs at the transitional points and through the design of those transitional points. See the prescriptive work log for more information.

**DWGNRA Trail Work Log Synopsis**

Trail name: Coppermines Trail  
 Length: 2.12  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Kaiser Road/Coppermines

Filename: *coppermn.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	138	11	2.76	3.45
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	8	1	0.20	0.27
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	40	n/a	0.40	0.50
<b>Estimates of Total Labor Required:</b>					<b>3.36</b>	<b>4.22</b>

**Comment:**

Ideal trail for loop hikes when walked in conjunction with Kaiser Road Trail and a section of the A.T.

**DWGNRA Trail Work Log Synopsis**

Trail name: Douglas Trail (Worthington State Park)  
 Length: 1.72  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *douglas.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	high	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	839	46	16.78	20.98
Expected Level of Maintenance:	low	Wood Water Bar	20	1	0.50	0.67
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>17.28</b>	<b>21.65</b>

**Comment:**  
 Some vehicle traffic is occurring on this trail. Drainage is the greatest need. The tread may be able to support bicycle traffic, but the relative ease of access to the AT suggests that such use may present a conflict.

**DWGNRA Trail Work Log Synopsis**

Trail name: Dunnfield Creek Drainage Trail  
 Length: 1.12  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Dunnfield

Filename: *dunnf\_s.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	2	0.50	0.67
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	high	Step-stones	n/a	31	6.20	7.75
<b>Recommended Use:</b>	hiking	Ditching	452	17	9.04	11.30
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	33	2	0.83	1.10
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	90	1	4.50	9.00
		Stream Bridge	81	3	49.09	61.36
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	15	n/a	0.15	0.19
<b>Estimates of Total Labor Required:</b>					<b>70.31</b>	<b>91.37</b>

**Comment:**

Mountain bicycle use is occurring. This requires use of AT. An Information & Education campaign should be initiated. Concern for safety results from two of the bridges at the upper end of the trail (see work log for details). Above the junction with Holly Spring trail, Dunnfield Creek Trail is non-existent. Needs to be defined. See comments concerning *Upper Dunnfield Creek Drainage Trail*.

**DWGNRA Trail Work Log Synopsis**

Trail name: Dunnfield Creek (Upper)  
 Length: 0.73  
 Stage to Incorporate into Trail System: 2x  
 Local Park Area: Dunnfield

Filename: *dunnf\_n.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	moderate	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	low	Step-stones	n/a	38	7.60	9.50
Recommended Use:	hiking	Ditching	373	20	7.46	9.33
Expected Level of Maintenance:	low	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	No	Rock Water Bar	15	1	0.75	1.50
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>15.81</b>	<b>20.33</b>

**Comment:**

Trail is currently quite undeveloped from the terminus of Holly Springs Trail north along the Dunnfield Creek drainage. This trail needs only minimal work to establish a new loop trail complementing the AT. Stream crossings will need step-stones or bridges if the user type is other than backcountry-oriented. The trail connects with Upper Yards Creek Reservoir area and provides access to the AT and the Mt Tammany Fire Road along the ridge. Camping is occurring along the length of the trail. The nature of the trail (backcountry or higher level maint.) should be communicated to the public in guidebooks and as the transition, if any, occurs. A second trail, blazed with red dots, connects directly with Sunfish Pond. This second trail was not logged as part of this survey.

**DWGNRA Trail Work Log Synopsis**

Trail name: Dunnfield/I-80 Link  
 Length: 0.08  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Mt. Tammany

Filename: *tmmlnk.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	11	1.83	2.75
Level of Use:	intensive	Step-stones	n/a	0	0.00	0.00
Recommended Use:	intensive	Ditching	0	0	0.00	0.00
Expected Level of Maintenance:	moderate	Wood Water Bar	13	2	0.33	0.43
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	35	4	1.00	1.40
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>3.16</b>	<b>4.58</b>

**Comment:**  
 This short route connects the Dunnfield Creek parking area with a rest stop along Westbound I-80. Some work was done in Oct. 1989 by an AMC vol. crew. Needs signs, blazing, etc. Another route that is heavily eroded and clearly visible from Dunnfield lot should be removed. See the *Mount Tammany: Dunnfield Lot to Overlook* work log for further comments about the trailhead configuration here.

**DWGNRA Trail Work Log Synopsis**

Trail name: Fossil Trail  
 Length: 1.03  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: PEEC

Filename: *fossil.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	20	3.33	5.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	42	8.40	10.50
<b>Recommended Use:</b>	hiking	Ditching	51	6	1.02	1.28
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	30	2	0.75	1.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	135	17	3.86	5.40
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>17.36</b>	<b>23.18</b>

**Comment:**

Trail needs signs, some short relocations to avoid a swamp, and replacement of the nature trail reference posts. A sign directing people back to the upper trailhead from the one at the PEEC outdoor theatre would be helpful.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Garvey Connector (Proposed)  
**Length:** 0.76  
**Stage to Incorporate into Trail System:** 2x  
**Local Park Area:** Worthington

**Filename:** grvycnct.log

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	none	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	low	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	30	1	0.60	0.75
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>0.60</b>	<b>0.75</b>

**Comment:**

This is a proposed connector between the Garvey Springs trail and the Northwest Trail in NJ. The route parallels Old Mine Road and provides an alternative connection between the parking at North West trailhead near the river and the Worthington Campground.

**DWGNRA Trail Work Log Synopsis**

Trail name: Garvey Spring Trail (Upper)  
 Length: 0.59  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *garveyup.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	83	6	1.66	2.08
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	24	8	0.60	0.80
<b>Sensitive Areas?:</b>	No	Rock Water Bar	30	2	1.50	3.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>3.76</b>	<b>5.88</b>

**Comment:**  
 The top junction with the A.T. has no signs and is blazed blue. The remainder of the trail is blazed orange. The trail should be blazed blue down to the Northwest Trail. Most of the problems are associated with drainage-needs at the upper end of the trail. It is recommended that the upper and lower sections be separately named.

**DWGNRA Trail Work Log Synopsis**

Trail name: Garvey Springs Trail (Lower)  
 Length: 0.54  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *garvylow.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	240	14	4.80	6.00
Expected Level of Maintenance:	moderate	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	No	Rock Water Bar	25	2	1.25	2.50
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>6.05</b>	<b>8.50</b>

**Comment:**

Located in Worthington State Forest, this trail forms a part of several loop hikes. There are a number of gullies resulting from a lack of drainage maintenance on the roadbed that makes up its tread. Signs are needed at all junctions. The lower trailhead, at the state campground, would be a good spot for an informational Wayside Exhibit (kiosk). It is suggested that the upper and lower sections be separately named.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Hamilton Ridge (Old Military Road To Pioneer Trail)  
**Length:** 1.07  
**Stage to Incorporate into Trail System:** 2  
**Local Park Area:** VanCampens/Pioneer

**Filename:** *hamilton.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	none	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	multiple	Ditching	0	0	0.00	0.00
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>0.00</b>	<b>0.00</b>

**Comment:**  
 An asphalt surfaced road in good shape and capable of supporting bicycle, walking, and other uses. Needs signs and improved parking.

**DWGNRA Trail Work Log Synopsis**

Trail name: Hemlock Pond Trail (Orange Dot)  
 Length: 0.40  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Blue Mtn Lakes

Filename: *hmlck.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	34	3	0.68	0.85
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	25	5	0.63	0.83
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>1.31</b>	<b>1.68</b>

**Comment:**  
 Trail connects Hemlock Pond with the AT. Good shape, needs brushing and blazing (blaze blue due to A.T?). Soils and ledge dictate a footpath category.

**DWGNRA Trail Work Log Synopsis**

Trail name: Hemlock Pond Woods Road  
 Length: 0.53  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Blue Mtn Lakes

Filename: *hemlk\_rd.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	multiple	Ditching	155	7	3.10	3.88
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>3.10</b>	<b>3.88</b>

**Comment:**

The roadbed is not as stable as other woods roads in the area and will likely require hardening if equestrian use is to become common. The maintenance figures do not reflect any work that might be required as a result of the introduction of equestrian use. This woods road makes for a nice, relatively secluded experience with the a pond and some streams.

**DWGNRA Trail Work Log Synopsis**

Trail name: Hidden Falls Trail (Upper)  
 Length: 0.72  
 Stage to Incorporate into Trail System: 2  
 Local Park Area: Hidden Falls/Buttermilk Falls

Filename: hdnfls\_1.log

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	133	9	2.66	3.33
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	19	2	0.48	0.63
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>3.14</b>	<b>3.96</b>

**Comment:**  
 Has been suggested as a horse trail. Soils suggest this use may be problematic. Signs are needed. A spur to the waterfall needs to be marked and installed. A new trail to connect the lower end of this trail with the parking and trailhead at Buttermilk Falls would eliminate a five to ten minute road-walk.  
 This trail would provide a good loop if connected to Buttermilk Falls. Additional field trips are needed to establish the preferred route for some lower sections of the trail and to pursue a route to the falls, now reached by a spur at the bottom of the trail. Blazing and drainage are the greatest needs.

**DWGNRA Trail Work Log Synopsis**

Trail name: Hidden Falls (Lower)

Filename: *hdnfls\_2.log*

Length: 0.72

Stage to Incorporate into Trail System: 2

Local Park Area: Hidden Falls/Buttermilk Falls

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	low	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	133	9	2.66	3.33
Expected Level of Maintenance:	low	Wood Water Bar	19	2	0.48	0.63
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>3.14</b>	<b>3.96</b>

**Comment:**

This section of trail should be renamed as it is quite distinct from the lower Hidden Falls Trail. It passes an interesting beaver pond that appears to be inactive. Signs, blazing, and other basic needs are the only work now necessary.

**DWGNRA Trail Work Log Synopsis**

Trail name: Hidden Lake (PA)  
 Length: 1.85  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Hidden Lake

Filename: *hidnlak.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	28	5.60	7.00
Recommended Use:	hiking	Ditching	430	14	8.60	10.75
Expected Level of Maintenance:	low	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	Yes	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	35	1	1.75	3.50
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	95	n/a	0.95	1.19
<b>Estimates of Total Labor Required:</b>					<b>16.90</b>	<b>22.44</b>

**Comment:**

Hidden Lake Trail is currently a nature trail in need of repair. The interpretive posts should be replaced and the necessary tread work completed. Horse use should not overlap with the nature trail. The tread is not designed for this, and the new use may conflict with the nature trail experience.

**DWGNRA Trail Work Log Synopsis**

Trail name: Holly Spring Trail  
 Length: 0.44  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Dunnfield

Filename: *hollyspg.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>		<u>Estimated Days of Labor</u>		
		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	multiple	Log Steps	n/a	0	0.00	0.00
Level of Use:	high	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	194	13	3.88	4.85
Expected Level of Maintenance:	moderate	Wood Water Bar	30	2	0.75	1.00
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>4.63</b>	<b>5.85</b>

**Comment:**  
 Trail joins AT, so the preferred use is assumed to be hiking. Several loops are created by this connector. Signing and blazing are necessary.

**DWGNRA Trail Work Log Synopsis**

Trail name: Indian Ladders  
 Length: 1.83  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Indian Ladders/PEEC

Filename: *indianld.log*

**General Characteristics**

**Maintenance Figures**

**Estimated Days of Labor**

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	47	11.75	15.67
<b>Existing Use:</b>	hiking	Log Steps	n/a	125	20.83	31.25
<b>Level of Use:</b>	high	Step-stones	n/a	66	13.20	16.50
<b>Recommended Use:</b>	hiking	Ditching	265	11	5.30	6.63
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	77	6	1.93	2.57
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	285	5	14.25	28.50
		Stream Bridge	65	2	39.39	49.24
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	735	n/a	7.35	9.19
<b>Estimates of Total Labor Required:</b>					<b>114.00</b>	<b>159.55</b>

**Comment:**

This trail has features which will attract use regardless of management efforts. It also has safety concerns which require a large investment to mediate: bridges needing replacement, extensive trail tread cribbing, etc. Once the initial work to stabilize the tread is complete, little annual maintenance is to be expected. Given the degree of effort identified, it is recommended that another trip be made to the trail to concur with or revise the estimate. ORV use is occurring in the Hemlock groves at the upper end of this trail.

Trail's upper end needs to be blazed. Unclear whether route should be on E. or W. bank of stream. A loop seems possible, but much work would be needed in the E. bank to get the tread to descend and then cross stream safely. See the work log for more information.

**DWGNRA Trail Work Log Synopsis**

Trail name: Kaiser Road Trail  
 Length: 2.03  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Kaiser Road/Coppermines

Filename: *kaisertr.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	moderate	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	0	0.00	0.00
Recommended Use:	hiking	Ditching	178	17	3.56	4.45
Expected Level of Maintenance:	low	Wood Water Bar	8	1	0.20	0.27
Sensitive Areas?:	No	Rock Water Bar	52	4	2.60	5.20
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>6.36</b>	<b>9.92</b>

**Comment:**

Some mountain bike use is occurring on nearby trails. Such use should be monitored on this trail. The soils and slopes do not appear capable of supporting the use. In general the trail is in very good condition.

**DWGNRA Trail Work Log Synopsis**

Trail name: Mount Minsi Trail  
 Length: 2.72  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Mt Minsi

Filename: *maminsi.log*

**General Characteristics**

**Maintenance Figures**

**Estimated Days of Labor**

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	8	2.00	2.67
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	high	Step-stones	n/a	15	3.00	3.75
<b>Recommended Use:</b>	multiple	Ditching	325	29	6.50	8.13
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	281	23	7.03	9.37
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	58	5	2.90	5.80
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	3	n/a	0.03	0.04
<b>Estimates of Total Labor Required:</b>					<b>21.46</b>	<b>29.76</b>

**Comment:**

Hiking and biking are the predominate uses indicated by observations of the tread. Biking should be limited to the fire road section. It is likely that most use will be contained to the road since the trail section is difficult to ride, but tire tracks indicate that bikes are being ridden along all of the tread. An Info.&Educ. effort would contribute to a reduction in this traffic, if this is desired.

**DWGNRA Trail Work Log Synopsis**

Trail name: Mount Tammany: Dunnfield Lot to Overlook  
 Length: 1.20  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Mt. Tammany

Filename: *tammany2.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	48	12.00	16.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	high	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	39	4	0.78	0.98
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	25	3	0.63	0.83
<b>Sensitive Areas?:</b>	No	Rock Water Bar	78	5	3.90	7.80
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	20	n/a	0.20	0.25
<b>Estimates of Total Labor Required:</b>					<b>17.51</b>	<b>25.86</b>

**Comment:**

The lower end of this trail should be relocated for ~230 yds to facilitate access to-and-from both parking lots (one provides access to Dunnfield Creek and the other is an I-80 rest-area). There is a second, more direct route to the first overlook. This route could be signed and blazed as an official trail. Some drainages might have to be installed, but little else since the tread is quite rocky and stable. This second route may be more difficult for some to hike than the one on this log.

**DWGNRA Trail Work Log Synopsis**

Trail name: NJ. District Ranger House to Thunder Mountain.  
 Length: 0.19  
 Stage to Incorporate into Trail System: 3  
 Local Park Area: Thunder Mtn

Filename: *njranghs.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	5	1.25	1.67
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	low	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	4	1	0.08	0.10
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	10	2	0.25	0.33
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>1.58</b>	<b>2.10</b>

**Comment:**

It is possible to connect the Thunder Mountain Trail with existing parking at the District Ranger Office/House. A short section of new tread would have to be installed near the house (250' long). Possibility of increased parking pressure at the existing lot should be incorporated into any final proposal.

**DWGNRA Trail Work Log Synopsis**

Trail name: Northwest Trail (Worthington State Park)  
 Length: 2.04  
 Stage to Incorporate into Trail System: 1x  
 Local Park Area: Worthington

Filename: *nwtrl.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
Difficulty:	moderate	Rock Steps	n/a	43	10.75	14.33
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	22	4.40	5.50
Recommended Use:	hiking	Ditching	557	27	11.14	13.93
Expected Level of Maintenance:	low	Wood Water Bar	40	2	1.00	1.33
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>27.29</b>	<b>35.09</b>

**Comment:**

Possible overlap of parking pressures from fishing and hiking. Trail should be blazed on an AT based format. Lower part of trail ascends steeply up several old roadbeds. Depending on need and the anticipated users, relocating the route to take advantage of other, less steep roads should be considered.

**DWGNRA Trail Work Log Synopsis**

Trail name: Old Woods Road: South End  
 Length: 1.82  
 Stage to Incorporate into Trail System: 2  
 Local Park Area: Blue Mtn Lakes

Filename: *oldwdrds.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	70	14.00	17.50
<b>Recommended Use:</b>	hiking	Ditching	520	20	10.40	13.00
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	45	2	2.25	4.50
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>26.65</b>	<b>35.00</b>

**Comment:**  
 Trail viewed after 3 days of rain. Should be walked when dry to double-check the assumptions of this report. Drainage is imperative. Soils seem susceptible to damage from any wheeled-use and from horse use, unless tread hardening is done prior to introduction of such use.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Old Woods Road: Between Hidden Falls sections  
**Length:** 0.66  
**Stage to Incorporate into Trail System:** 2  
**Local Park Area:** Hidden Falls/Buttermilk Falls

**Filename:** wdrdhfls.log

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	low	Step-stones	n/a	4	0.80	1.00
<b>Recommended Use:</b>	hiking	Ditching	167	9	3.34	4.18
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	187	6	4.68	6.23
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	41	3	2.05	4.10
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>10.87</b>	<b>15.51</b>

**Comment:**

This trail has been proposed as a possible equestrian trail. The existing erosion problems suggest that the soil will require extensive work to be capable of supporting such use. The route serves as a good connection between Hidden Falls Trail and the A.T. Figures for needed-work-totals do not indicate the work necessary to broaden the feasible user types; they indicate the work necessary to improve the trail as a hiking route.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Old Woods Road: Northern End  
**Length:** 1.08  
**Stage to Incorporate into Trail System:** 2  
**Local Park Area:** Buttermilk Falls/Blue Mtn Lakes

**Filename:** oldwdrd.log

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	17	3.40	4.25
<b>Recommended Use:</b>	multiple	Ditching	10	1	0.20	0.25
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	15	1	0.38	0.50
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>3.98</b>	<b>5.00</b>

**Comment:**

This section, from Hidden Falls Trail to the northern jct. with the A.T., is in fairly good shape given the current low use. The few wet sections have sufficient passage for hikers. Heavy new uses will alter the necessary work and require much more drainage to control erosion. Potential impacts to several beaver ponds found along this section need to be considered. Dams need to be crossed, and heavy use may necessitate hardening or relocating the tread.

**DWGNRA Trail Work Log Synopsis**

Trail name: Orchard/Mccool Trail  
 Length: 0.49  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: VanCampen's

Filename: *orchrd.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	15	3.00	3.75
Recommended Use:	hiking	Ditching	102	7	2.04	2.55
Expected Level of Maintenance:	low	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	Yes	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>5.04</b>	<b>6.30</b>

**Comment:**  
 Connects Hamilton Ridge Road with Millbrook Village. An area of impact-sensitive soils needs hardening near spring at lower (Village) end of trail. Safety concerns are due to unsigned road crossing at Millbrook Village. Trail is likely to need widening and hardening if converted to bicycle use.

**DWGNRA Trail Work Log Synopsis**

Trail name: Pioneer Trail  
 Length: 2.00  
 Stage to Incorporate into Trail System: 2  
 Local Park Area: VanCampen's

Filename: *pioneer.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	300	0	6.00	7.50
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>6.00</b>	<b>7.50</b>

**Comment:**  
 Pioneer needs to be relocated or reestablished for much of its length. Signing and blazing, and drainage are crucial needs as well.

**DWGNRA Trail Work Log Synopsis**

Trail name: Pool Area  
 Length: 1.00  
 Stage to Incorporate into Trail System: 3  
 Local Park Area: Blue Mtn Lakes

Filename: *pool.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	multiple	Log Steps	n/a	0	0.00	0.00
Level of Use:	low	Step-stones	n/a	0	0.00	0.00
Recommended Use:	multiple	Ditching	0	0	0.00	0.00
Expected Level of Maintenance:	low	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>0.00</b>	<b>0.00</b>

**Comment:**

These are general notes on roughly a mile of the road network in the Pool area. Several miles of old woods roads are available for use (10+?). Most are gravel-based roads with grass recovering in the tread. This base seems strong enough to support horses throughout much of the road network. Existing drainages have fallen into disrepair and would have to be fixed in addition to installing new cross-drains. Some work on certain sections of roadbed may also be necessary to channel water from seeps and to repair some existing gullies. Seasonal limits on access may be appropriate. This area appears to be more suited for less-intensive use than the Blue Mountain Lakes area. The proximity of the two areas allows for a variety of experiences in a local area.

**DWGNRA Trail Work Log Synopsis**

Trail name: Rattlesnake Swamp Trail  
 Length: 2.64  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: VanCampen's

Filename: *rattlswp.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	14	3.50	4.67
<b>Existing Use:</b>	hiking	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	96	19.20	24.00
<b>Recommended Use:</b>	hiking	Ditching	158	.9	3.16	3.95
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	19	3	0.48	0.63
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	70	7	3.50	7.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>29.84</b>	<b>40.25</b>

**Comment:**  
 Because of the proximity to the A.T., this trail should cater to hiking use, or other pedestrian activities. Horse or bicycle use may pose a conflict with the A.T. corridor. The ATC should be contacted to determine sensitivity to proximal use of this type. Once the initial construction needs referenced in the work log are complete, the maintenance should be minimal. Brushing, blazing and signing are needed at all junctions. Some signs do exist in good shape at the northern junction with the access road to the repeater tower. Safety concerns include stream crossings (minor problems) and old outlying buildings and foundations of the current Camp Mohican.

**DWGNRA Trail Work Log Synopsis**

Trail name: Shawnee Horse Trail (Proposed)  
 Length: 2.00  
 Stage to Incorporate into Trail System: 3  
 Local Park Area: Hidden Lake

Filename: *shawnee.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	multiple	Log Steps	n/a	0	0.00	0.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	multiple	Ditching	1026	37	20.52	25.65
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>20.52</b>	<b>25.65</b>

**Comment:**

This information represents a portion of the proposed Hidden Lake Horse trail. This section was chosen to be included in a work-log because of comments concerning drainage-needs and hardening. It represents the section most likely to have high work needs if the trail were to be targeted for full development. The proposed route crosses local roads a total of five times, suggesting that both maintenance and safety may be of concern as horses wear on the pavement and vehicles share the route. Comments by individuals more familiar with issues of horse use should be solicited.

See the work log for comments regarding the need to harden sections of the tread reviewed for AMC report.

**DWGNRA Trail Work Log Synopsis**

Trail name: Sunrise Trail  
 Length: 3.49  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: PEEC

Filename: *sunrise.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	3	0.75	1.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	10	1.67	2.50
<b>Level of Use:</b>	moderate	Step-stones	n/a	32	6.40	8.00
<b>Recommended Use:</b>	hiking	Ditching	15	1	0.30	0.38
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	70	n/a	0.70	0.88
<b>Estimates of Total Labor Required:</b>					<b>9.82</b>	<b>12.76</b>

**Comment:**

Several relocations are needed (referenced specifically on the work log). One will bypass a very difficult climb through a gap in a low plateau. The gap now has a knotted rope to aid hikers. Very little work is required on the stable sections of tread. This indicates good soils and little future maintenance once the recommended improvements are made.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Thunder Mtn (Military Road Loop)  
**Length:** 2.36  
**Stage to Incorporate into Trail System:** 2  
**Local Park Area:** Thunder Mtn

**Filename:** thndrmtn.log

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	low	Rock Steps	n/a	5	1.25	1.67
<b>Existing Use:</b>	multiple	Log Steps	n/a	36	6.00	9.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	8	1.60	2.00
<b>Recommended Use:</b>	multiple	Ditching	187	20	3.74	4.68
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	93	12	2.33	3.10
<b>Sensitive Areas?:</b>	No	Rock Water Bar	10	2	0.50	1.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	56	2	33.94	42.42
		Bog Bridge	350	44	10.00	14.00
		Sidehilling	355	n/a	3.55	4.44
<b>Estimates of Total Labor Required:</b>					<b>62.91</b>	<b>82.31</b>

**Comment:**  
 Crossing of Rt 615 is potentially dangerous and should be reviewed by one familiar with traffic safety management. Also, if horse use is to be accommodated, certain sections of the existing tread will need to be substantially improved, and the few bridges on the trail will need to be engineered to support this use.

**DWGNRA Trail Work Log Synopsis**

Trail name: Tom's Creek Trail  
 Length: 1.73  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: Tom's Creek

Filename: *tomsckr.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	moderate	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	37	7.40	9.25
Recommended Use:	hiking	Ditching	145	8	2.90	3.63
Expected Level of Maintenance:	low	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	No	Rock Water Bar	0	0	0.00	0.00
Potential Safety Concerns?:	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>					<b>10.30</b>	<b>12.88</b>

**Comment:**

This trail could be handicapped-accessible for the first mile. Safety concerns result from the stream crossings which can be deep and swift at times. Trail ends among some new homes constructed along the park boundary. Connectors with other trails are possible.

**DWGNRA Trail Work Log Synopsis**

Trail name: Tumbling Waters (Lower End)  
 Length: 0.38  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: PEEC

Filename: *tumbllow.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	46	7.67	11.50
<b>Level of Use:</b>	moderate	Step-stones	n/a	0	0.00	0.00
<b>Recommended Use:</b>	hiking	Ditching	15	1	0.30	0.38
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	0	0	0.00	0.00
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	75	1	3.75	7.50
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
		<b>Estimates of Total Labor Required:</b>				

**Comment:**

Lower end is in good shape. The parking should be reviewed. When exiting the existing pullout area, northbound traffic is difficult to see.

The log steps need to be installed next to the falls area. Rocks could be substituted, but this may necessitate some pins to support the rocks. Additional field review prior to finalizing any effort is recommended here.

**DWGNRA Trail Work Log Synopsis**

**Trail name:** Tumbling Waters (Main Loop)  
**Length:** 2.84  
**Stage to Incorporate into Trail System:** 1  
**Local Park Area:** PEEC

**Filename:** *tmb1-h2o.log*

<u>General Characteristics</u>		<u>Maintenance Figures</u>			<u>Estimated Days of Labor</u>	
		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	0	0.00	0.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	8	1.33	2.00
<b>Level of Use:</b>	moderate	Step-stones	n/a	8	1.60	2.00
<b>Recommended Use:</b>	hiking	Ditching	231	26	4.62	5.78
<b>Expected Level of Maintenance:</b>	low	Wood Water Bar	18	3	0.45	0.60
<b>Sensitive Areas?:</b>	Yes	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	24	2	0.69	0.96
		Sidehilling	370	n/a	3.70	4.63
<b>Estimates of Total Labor Required:</b>					<b>12.39</b>	<b>15.97</b>

**Comment:**

Tread is in very good condition. Hemlock groves near falls are impacted by the heavy use (see DWGNRA Division of Resource Management for details). Safety concerns result from hazards associated with rebar employed to hold-in some of the log steps. Steps should be replaced with longer logs that can be anchored with rocks.

**DWGNRA Trail Work Log Synopsis**

Trail name: Van Campen's Glen Trail  
 Length: 1.12  
 Stage to Incorporate into Trail System: 1  
 Local Park Area: VanCampen's

Filename: *vancamp.log*

**General Characteristics**

**Maintenance Figures**

**Estimated Days of Labor**

		Item	Total Feet	Units	Low	High
<b>Difficulty:</b>	moderate	Rock Steps	n/a	30	7.50	10.00
<b>Existing Use:</b>	hiking	Log Steps	n/a	30	5.00	7.50
<b>Level of Use:</b>	intensive	Step-stones	n/a	35	7.00	8.75
<b>Recommended Use:</b>	intensive	Ditching	0	0	0.00	0.00
<b>Expected Level of Maintenance:</b>	moderate	Wood Water Bar	25	2	0.63	0.83
<b>Sensitive Areas?:</b>	No	Rock Water Bar	0	0	0.00	0.00
<b>Potential Safety Concerns?:</b>	Yes	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	130	n/a	1.30	1.63
<b>Estimates of Total Labor Required:</b>					<b>21.43</b>	<b>28.71</b>

**Comment:**

For all the use this area gets, the tread is in good condition. Needs marking, improved parking, and some basic hardening. Containing the use to one side of the Glen is not necessary, nor likely to be successful.

**DWGNRA Trail Work Log Synopsis**

Trail name: Wood Road at Upper Pioneer  
 Length: 0.41  
 Stage to Incorporate into Trail System: 3  
 Local Park Area: VanCampen's/Pioneer

Filename: *wr\_pion.log*

General Characteristics

Maintenance Figures

Estimated Days of Labor

		Item	Total Feet	Units	Low	High
Difficulty:	low	Rock Steps	n/a	0	0.00	0.00
Existing Use:	hiking	Log Steps	n/a	0	0.00	0.00
Level of Use:	moderate	Step-stones	n/a	0	0.00	0.00
Recommended Use:	multiple	Ditching	115	6	2.30	2.88
Expected Level of Maintenance:	low	Wood Water Bar	0	0	0.00	0.00
Sensitive Areas?:	No	Rock Water Bar	20	1	1.00	2.00
Potential Safety Concerns?:	No	Cribbing	0	0	0.00	0.00
		Stream Bridge	0	0	0.00	0.00
		Bog Bridge	0	0	0.00	0.00
		Sidehilling	0	n/a	0.00	0.00
<b>Estimates of Total Labor Required:</b>						

**Comment:**  
 This connector will be useful to walkers, hikers, and bicyclists.

## **Appendix B**

### **Rapid Trail Survey Forms and Procedures; Prescriptive Work Log Tally Sheet**



## TRAIL SURVEY PROCEDURES

**SCOPE:** This survey includes all trail segments within park boundaries, including Worthington and Stokes State Forest. The trail system begins wherever a trail branches off from a road or wherever a permanent blockage (unlockable gate or cable, soil mound, trench, etc.) prevents further travel by 4-wheeled vehicles. In some instances trails will include sections of roads, even those which are open to the public. However, do not include road segments as the beginning or end of a trail. Include only road segments which are sandwiched by trail segments, ie. trails begin as defined above.

**INSTRUCTIONS:** Using the 1/400 scale topographic maps, follow and carefully map all trails and old abandoned roads. Do not follow or include trail segments which are so overgrown by vegetation that walking and locating the tread is difficult. Pay constant and close attention to changes in topography as you hike, this will help you to locate the trails accurately. Mark all trails and codes in red pencil.

- 1) **Trail Name:** Label trail segments with any known names and include the color of paint blazes in parentheses when present.
- 2) **Accessibility:** Pay close attention to the width and accessibility of the trail as you hike. Many trails follow old overgrown jeep roads and driveways. Use the two letter codes described below to label the accessibility of all trail segments, be extremely careful that all segments are adequately labelled.

**Roads:** Segment is or used to be a Road. Width is generally greater than 6 feet and two ruts can often be distinguished.

R2 = segment passable by a 2-wheel drive vehicle such as a pickup truck

R4 = segment passable only by a 4-wheel drive vehicle with a chain saw for tree falls

**Trails:** Segment is a Trail. Width is generally less than 6 feet and could not be driven by a 4-wheel drive vehicle.

TE = segment is fairly open, Easily followed, and largely free of overhanging vegetation

TD = segment is partly overgrown and followed with occasional Difficulty

- 3) **Scenic Features and Springs:** Mark the exact location of any significant scenic features with a small dot and label with one of codes listed and described below:

W = Waterfall over approximately 15 feet in height

V = Vista with a full or partially obscured distant view

H = Historic feature: attractive stone foundations or other interesting features

S = Spring which appears to be a fairly permanent water source

4) Maintenance Work: Label the approximate location or stretch of trail that, in your estimation, would require fairly extensive maintenance work. Use the codes listed and described below:

P = Permanently boggy or wet section of trail (>30 ft.) requiring more than just waterbars to correct (for example, turnpiking, bog bridging, relocations, etc.)

R = Rutting or excessive erosion present (>30 ft.) requiring extensive tread work to correct (for example, a combination of waterbars, steps, switchbacks, culverts, etc.)

E = Excessive slope (>20%) requiring extensive step work or relocation

B = Bridge needed to cross stream, even if a log or rock crossing is present

5) Recommendations: Once you have finished mapping all the trails in a particular area, record your impressions and recommendations regarding potential trails to be included in the final NPS trails system. Ideally, such trails would include existing segments with high scenic values and accessibility and low maintenance needs. Label trail segments with numbers using a grey-lead pencil where necessary so you can refer to individual trail segments. Record your comments on separate paper, including the map number, traditional trail name (if one exists), and labelled numbers.

## ROAD SURVEY PROCEDURES

**SCOPE:** This survey includes all easily discernable, commonly travelled routes of road width (generally > 6 feet) within and adjacent to park boundaries, including Worthington State Forest. The road system ends wherever a road ends, becomes "Rarely Travelled" (see NPS Roads Classification Guide), or narrows to a trail width. Rarely Travelled Road will be mapped according to the Trail Survey Procedures.

**GENERAL INSTRUCTIONS:** All road segments (excluding Rarely Travelled Roads) are to be mapped on 1/400 scale topographic maps using blue pencil. The Roads Survey Form will be filled out for each of these road segments except Access Roads (roads outside park boundaries). Use the codes provided and write legibly; information on these forms will be entered into a DBASE database. The survey process begins by mapping the roads and identifying individual road segments. Each road segment may have only one response for each of the parameters on the form. For example, parameter 10, Road Surface, may have only one surface type identified for each road segment. Always check the earlier roads survey to obtain any relevant information but verify the accuracy of any information used.

**FIELD INSTRUCTIONS:** Using blue pencil, map the exact locations of all commonly travelled routes of road width. Cross out all mapped roads which are no longer readily apparent. For roads outside park boundaries include only those which provide public access to the park and private roads which branch from these in close proximity to park boundaries. Do not drive or verify roads when posted against trespass. When you complete work on a map, using a grey lead pencil, circle or otherwise indicate the areas you worked on and label with your first name. Identify and label, in blue, individual road segments for the following:

**NPS Class.** Using the NPS Road Classification Guidelines, identify and label individual road segments.

**Route Number and Name:** Where possible, label all roads with the official State, County or Township Route Numbers and Names.

**Surface:** Draw a short line across mapped roads to indicate the exact locations where road surface type changes. Use the codes from the form to label the road surface types on both sides of these locations.

**Width:** Draw a short line across mapped roads to indicate the exact locations where pronounced changes in road width occurs. Record the average widths of the road on both sides of these locations.

**Barriers:** Using the codes listed below, mark and label a dot on mapped roads to indicate the exact locations of any of the following barriers:

- BL = Barrier, locked - any type of barrier which can be locked/unlocked
- BC = Barrier, cable - any cable barrier which does not include a lock
- BB = Barrier, berm - any soil/rock barrier
- BT = Barrier, trench - any trench dug to prevent access
- BS = Barrier, stream - any deep stream (generally > 15 inches) or other erosional feature significant enough to prevent 4-wheel access
- BW = Barrier, wood - any log, telephone pole, or cut tree intentionally positioned to prevent access

**Note:** Do not mark or include natural treefalls

**OFFICE INSTRUCTIONS - MAPS:** All information mapped in the field should be carefully transferred to the designated office copies of the 1:400 maps. Verify and/or revise information supplied by field workers from 1 and 2 above once all fieldwork for a given map is complete. Then do the following:

**Ownership:** Check the information from the earlier road survey and the most current set of tract maps to evaluate road ownership. Draw a short line across mapped roads to indicate the exact locations where road ownership occurs. Use the codes from the form to label both sides of these locations.

**Maintenance and Snow Removal:** Refer to the maintenance classification information to evaluate road maintenance and snow removal. Draw a short line across mapped roads to indicate the exact locations where these classes change. Use the codes from the form to label both sides of these locations.

**OFFICE INSTRUCTIONS - FORMS:** Beginning at the bottom of the map, assign unique Road Segment ID codes to all road segments on the map. Refer to the NPS Roads Classification Guide for further guidance. Fill out a form for each road segment identified (excluding Rarely Travelled roads and Access Roads) using the information recorded on the maps and the procedures described below:

**Map Number(s):** Record the map number(s) which include the road segment, listing them in order of amount of road segment coverage.

**From/To:** Briefly describe where the road segment begins and where it ends using traditional road names or route numbers whenever possible.

**Access:** For Restricted Commonly Travelled roads only, record a "CL" if the segment is always closed to prevent public access and an "SO" if the segment is seasonally open to permit public access.

**Length:** The GIS can supply this once the maps are digitized. Leave blank at this time.

## ROAD SURVEY FORM

1) MAP NUMBER(S): \_\_\_\_\_

2) OLD ID #: \_\_\_\_\_

3) NEW ID #: \_\_\_\_\_

4) FROM: \_\_\_\_\_ TO: \_\_\_\_\_

5) ROUTE NUMBER: \_\_\_\_\_

6) ROUTE NAME(S): \_\_\_\_\_

7) NPS CLASS: \_\_\_\_\_  
PN = Principal                      CO = Connector  
SP = Special                        AD = Administrative  
PC = Primitive (Commonly Travelled)  
RC = Restricted (Commonly Travelled)

8) ACCESS: \_\_\_\_\_  
CL = Closed  
SO = Seasonally Open (Restricted Only)

9) OWNERSHIP: \_\_\_\_\_  
NP = NPS                              FD = Federal                      ST = State  
CY = County                        TP = Township

10) SURFACE: \_\_\_\_\_  
AS = Asphalt    GR = Gravel    DT = Dirt  
CT = Concrete

11) WIDTH: \_\_\_\_\_ ft. (excluding shoulder)

12) LENGTH: \_\_\_\_\_ mi. (nearest tenth)

13) MAINTENANCE: \_\_\_\_\_ MT = Maintained              MN = Not Maintained

14) SNOW REMOVAL: \_\_\_\_\_ SR = Yes              SN = No

DATE: \_\_\_\_\_

OBSERVER: \_\_\_\_\_





## Appendix C

### Proposed Management Goals and Objectives to Guide Backcountry Trail Camping



