

DOLLY SODS NORTH UXO CR SURVEY

CONDUCTED BY



USDA Forest Service
Monongahela National Forest
Heritage Resources

for the U.S. Army Corps of Engineers
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EXECUTIVE SUMMARY

The Corps of Engineers plans to remove unexploded ordnance from the Dolly Sods North Area. The ordnance is the result of artillery practice carried out during the World War II. The Forest Service, under contract with the Corps of Engineers surveyed the planned project impact area for cultural resources and located one prehistoric and two historic sites. Also, one previously documented prehistoric site was monitored within the project area. Only one of these sites is considered potentially eligible for the National Register of Historic Places as agreeded by the Forest Service, the Corps of Engineers, and the State Historic Preservation Office. The Forest Service will consult with the ordnance removal contractor to work out methods to minimize unavoidable impacts to the historic property.

Upon examination of this report the reader will find that a large segment of the report differs little from the content of the similar report on the Dolly Sods Wilderness UXO removal project (Whetsell, et. al., 1996). The similarities are due primarily to the fact that the areas ajoin one another and share much of the same geological, historical, prehistoric and biological background.

THE PROJECT AREA

The Dolly Sods North Area is located in the Allegheny Plateau Region of West Virginia in the Monongahela National Forest [Figure 1]. The Monongahela National Forest is administered by the United States Department of Agriculture- Forest Service, and lies entirely within the Potomac Ranger District.

The area is characterized by high, broad-topped mountains with high elevations, and is dissected by Red Creek, which flows from the Scenic Area's northern boundary near Bear Rocks to the area's southern boundary at the Dolly Sods Wilderness boundary. The average elevation of the Dolly Sods North is 3,850 feet. The lowest point, 3,550 feet, is at the Dolly Sods Wilderness Area boundary where Red Creek leaves the area, and the highest, 4,150 feet, is on Cabin Mountain, along the OA's western boundary, along a spine of rocks.

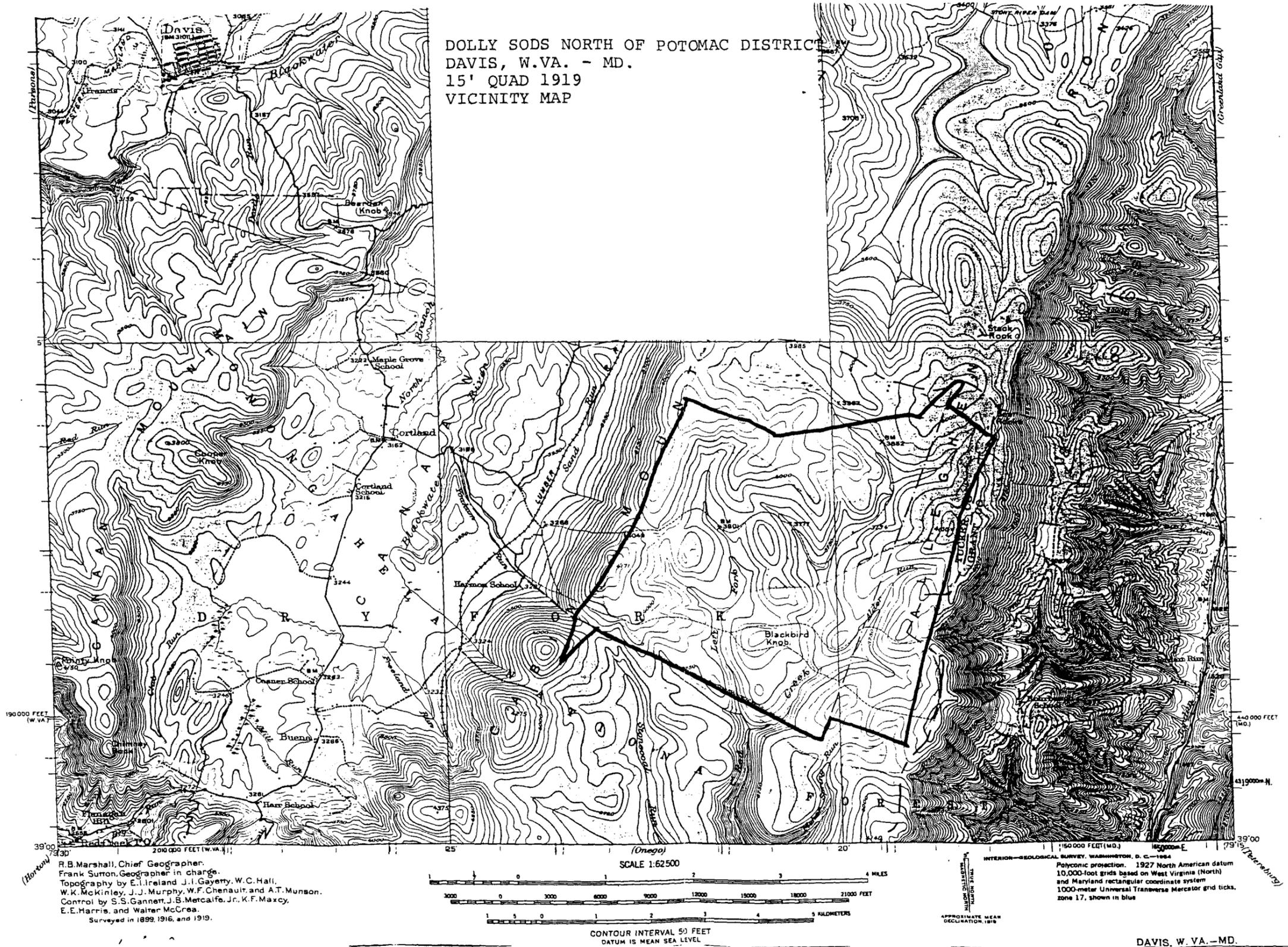
FOREST SERVICE HISTORY OF THE AREA

After the military operations were concluded and decontamination of the area was complete, the land was returned to the private owners in 1950. The region including Blackbird Knob and the two northern forks of upper Red Creek and the remaining area which comprises the current boundary of Dolly Sods North Scenic Area, was acquired by the U.S. Forest Service during two individual purchasing phases. The first purchase occurred on December 3, 1992, and conveyed 3,701.1 acres of land "situated on the headwaters of Red Creek in the Dolly Sods area, in Dry Fork District, Tucker County, West Virginia, being the same land conveyed by Western Pocahontas Properties Limited Partnership to The Nature Conservancy by deed dated July 25, 1991," to the U.S. Forest Service (Deed Book #136, pg. 179). [Figure 2]

The second phase purchase occurred on September 1, 1993 between the Nature Conservancy and the U.S. Forest Service. This agreement deeded 2,467.4 acres of land "situated at the headwaters of Red Creek in Cabin Mountain and Dolly Sods area. As in the first phase purchase, the land deeded in the second phase had been purchased from the Western Pocahontas Properties Limited Partnership by The Nature Conservancy, however, this was not deeded to the Conservancy until July 22, 1993 (Tucker County Deed Book, 142, pg. 454). [Figure 2]

Today, popular recreational activities in the Dolly Sods North area include hiking, camping, berry picking, photography, and bird watching, just to name a few. It is estimated that 75,000 visitors come to Dolly Sods North Scenic Area each year.

In 1991, the US Army Corps of Engineers began a study on how to remove any unexploded ordnance that are still present in the Dolly Sods Area. Their action plan is outlined in their report; Dolly Sods Wilderness Ordnance Removal Project, Environmental Assessment, 1995.



R.B. Marshall, Chief Geographer,
Frank Sutton, Geographer in charge,
Topography by E. J. Ireland, J. I. Gayetty, W. C. Hall,
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Control by S. S. Gannett, J. B. Metcalfe, Jr., K. F. Maxcy,
E. E. Harris, and Walter McCrea.
Surveyed in 1899, 1916, and 1919.

Fig. 1
p. 4

In order to ensure that historic and prehistoric resources are not severely impacted, a summer crew from the USDA-Forest Service's office in Elkins surveyed the Dolly Sods North Area to inventory all cultural resources that could be found within the Corps of Engineers search area.

The Forest Service crew surveyed every trail, as well as all campsites that could be located. The search corridor was 40ft wide, and all the trails. During the course of field work the crew recovered numerous pieces of artillery and mortar shell fragments and discovered one piece of unexploded ordnance in the middle of one of the main trails along upper Red Creek. In addition to the shell fragments, other artifacts, such as historical finds dating to the logging era of the area and one prehistoric site, were located and documented during the course of the survey.

Maneuver and Training Area

(Excerpt from Dolly Sods Ordnance Removal Project, Environmental Assessment)

During World War II, about 2,181,000 acres in the vicinity of Dolly Sods were used by the Thirteenth Army Corps of the Third Army for mountain training and maneuvers including the firing of artillery and mortars. This training continued from October 15, 1943, to July 1, 1944, with several divisions taking part in training. These divisions included the 77th Infantry from October 15, 1943 to January 2, 1944; the 28th Infantry from August 2, 1943 to September 30, 1943; the 31st Infantry from February 4, 1944 to March 28, 1944; and the 95th Infantry from May 1, 1944 to July 1, 1944.

Records on the military operations in the area are scarce because the majority of pertinent documents have been lost or destroyed over time, but it is known that the targets of the 105mm and 155mm artillery fire near the Dolly Sods Area included the southern face of Blackbird Knob and the eastern face of Cabin Mountain. There were, apparently, three groups of gun emplacements. One was in Canaan Valley, although the exact location of these guns is not known. A second was along Forest Service Road 75 from "a point near the Bell Knob Tower, north to the end of the road." Finally, there were gun emplacements "on the eastern side of the mountain on the Allegheny front...north of the Dolly Sods Wilderness Area." The gun emplacements to the west (the Canaan Valley) would have fired only upon Blackbird Knob while the positions to the east apparently fired at both Blackbird Knob and Cabin Mountain. The firing locations and targets are shown in [Figure 3].

In addition to this artillery fire, mortar fire took place in the area. The targets are unrecorded, however, it is possible that open,

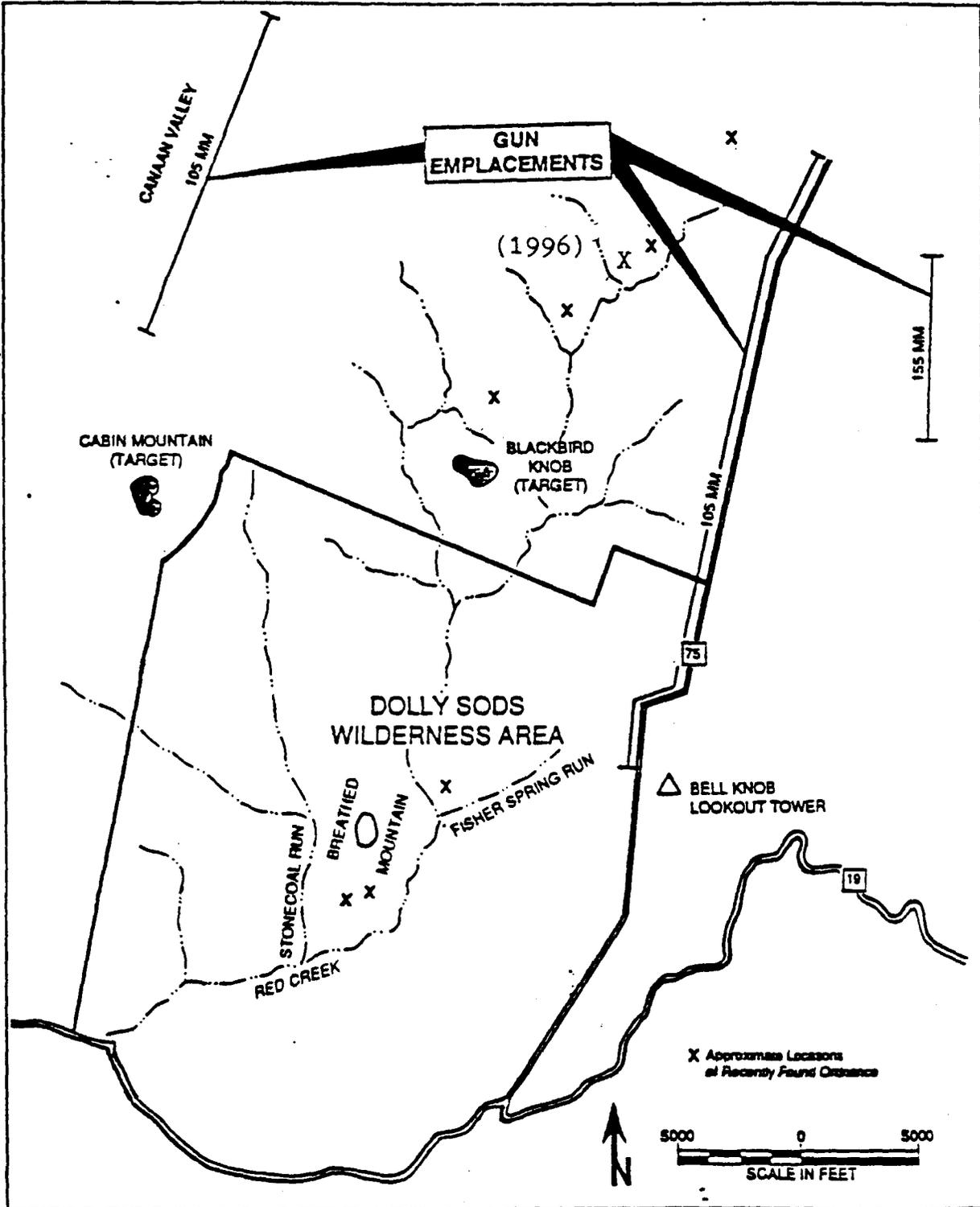


Figure 3 Firing locations and general target areas at Dolly Sods.
 Ordnance has been located throughout the area.

(Source U.S. Army COE: 1995)

high ground would have been targeted to lessen the likelihood of fires started by the explosions and to make impacts more visible. The mortars were probably fired from a multitude of locations around the Dolly Sods area.

It is known that the artillery range was grid-searched and decontaminated of unexploded ordnance following the end of operations in the area. At some later time, as persons hiking into the area continued to discover isolated ordnance, military Explosive, Ordinance Disposal (EOD) teams were used again to clear the area of unexploded ordnance. The exact location and extent of these disposal operations are unknown. Records have not been maintained.

Ordnance has been discovered incidently several times in the recent past. According to Forest Service personnel, three of these mortar rounds were found in the Dolly Sods Wilderness itself and four were found in Dolly Sods North, in the Blackbird Knob area. Four pieces of ordnance were found in 1994, and most recently one piece was discovered by Forest Service crew members in 1996 during the UXO field survey of Dolly Sods North. All of the recently discovered ordnance consists of 81mm mortar shells, however, it appears that 105mm artillery ordnance has been found in the vicinity of Dolly Sods in the past. In 1991, the U.S. Army Corps of Engineers conducted a feasibility study to determine the extent of contamination. Samplings of areas considered most likely to have been used as targets or to contain overshots were searched.

PHYSICAL SETTINGS

At present, the most important single mineral resource within the National Forest is coal. Seams of low sulfur coal occur throughout much of the Dolly Sod North Scenic region. The coal zone underlying the region is similar to the Dolly Sods Wilderness is Kittanning and part of the Allegheny formation of the Middle Pennsylvanian geologic series. In addition to coal, oil and gas are also present though of insufficient quantities to be economically productive. Although these resources are present now, it is doubtful they were exploited to any degree prior to the early twentieth century (USDA Forest Service 1977: 25-28).

Soil

Podzolic or leached soils are predominant within the Monongahela National Forest. Many of the soils occur as long irregular and broken bands of different widths, paralleling the ridge tops, mountain tops, and stream valleys. Others occur as widely scattered areas ranging in size from 10 acres to more than a square mile. Still others, where the underlying rocks are uniform, cover many square miles (Davis 1978:11).

Substantial Quaternary alluvial deposits are restricted to the following areas within the National Forest: Cranberry Glades and Green Bank-Arbovale area, Pocahontas County; Tygart Valley, Randolph County; Cheat Valley, Tucker County; and South Branch Valley near Petersburg, and Grant County.

Topography

The Monongahela National Forest lies within the Ridge and Valley and the Appalachian Plateau Physiographic Provinces. In the vicinity of the National Forest, this boundary approximates the Tucker/Grant, Randolph/Pendleton and Pocahontas/Pendleton county lines.

Most of the National Forest, however, lies west of the Allegheny Front within the Appalachian Plateau Physiographic Province, a deeply dissected system of plateaus whose elevations are generally higher than adjacent physiographic provinces. Within the region encompassing the forest, two sub-units of the Appalachian Plateau province are present. The Allegheny Mountains Section (Ibid.: 8) lies adjacent to the western edge of the Ridge and Valley province and includes the Allegheny Front, the Greenbrier River drainage and the network of parallel streams and ridges which characterize the headwater area of Cheat River. In this area, dissection has advanced to the point that the topography has lost most its plateau

characteristics. (Thornbury 1965:138) identifies two topographic traits which distinguish the Allegheny Mountains from adjacent regions within the province:

First, the altitudes and degree of dissection are greater here than in the unglaciated plateau to the west. Secondly, the rocks of this section are mildly folded and erosion on anticlines and synclines has produced a number of structurally controlled ridges and valleys that give to the topography a lineation not found in the adjacent Unglaciated Allegheny Plateau Section.

Stream alignment is similar to that found in the Ridge and Valley province with the major differences being that stream valleys in the Allegheny Mountains Section are typically broader and less constricted.

The Unglaciated Allegheny Plateau (Thornbury 1965) lies to the west of the Allegheny Mountains Section and represents the maturely dissected central section of the Appalachian Plateau. The drainage pattern is typically dendrite with major streams deeply cutting into the plateau. Stream valleys are frequently quite narrow with steep upland slopes, and form the headwaters of the Tygart Valley, Elk and Gauley Rivers.

Geologic Structure

The rocks underlying the Monongahela National Forest are of sedimentary origin, being chiefly composed of limestones, sandstones and shales. The youngest strata are of Pennsylvanian age and occur in southeastern Randolph County and along the southwestern perimeter of the National Forest. West of the Allegheny Front, the land was simply uplifted, forming a high plateau of essentially horizontal strata and capped predominantly with resistant sandstones and conglomerates. Present drainage patterns in both regions of the National Forest are quite distinctive and reflect this difference in underlying structure. Since Permian time, weathering and stream erosion have been constantly at work. (Reger, 1923)

Numerous iron-rich rounded and angular rocks were found near Blackbird Knob on Dolly Sods by the North Crew members. An explanation of the origin of the rounded or glob-like shaped and angular rock specimens reveals that after Pennsylvanian-aged sediment lithified subsequent mountain-building episodes fractured the rock, creating joints and voids. Percolating water leached iron oxides from the rock and re-deposited them in higher concentrations in the fractures and voids. There are documented examples of this from the Conemaugh Group [Figure 4], which is the same rock group that outcrops in the Blackbird Knob area of Dolly Sods. (Reger, 1923).

SYSTEM	SERIES	FORMATION MEMBER AND BED	LITHOLOGY	THICKNESS		DESCRIPTION		
				Coal bed IN. (CM)	FORMATION FT(M)			
QUATERNARY	UPPER PENNSYLVANIAN	ALLUVIUM			0-25	Boulders, gravel, and sand in flood plain and fan deposits.		
		CONEMAUGH FORMATION		0-28 (0-71) 0-21 (0-58)	(0-7.5)	Sandstone, shale, flint clay, and coal. Sandstone, light-gray, fine to coarse grained, feldspathic, micaceous, contains lenses of angular to subrounded quartz pebbles as much as 1 cm in diameter. Shale, highly weathered and iron-oxide stained, probably medium gray and grayish red; contains lenticular bed of flint clay and coal at base.		
		Sandstone member			100± (30.5)			
		ALLEGHENY FORMATION					Sandstone, very light gray to white, fine to coarse grained, crossbedded, quartzose, conglomeratic with well-rounded quartz pebbles ranging mostly from 1 to 3 cm in diameter.	
		Kittanning coal zone		0-80 (0-203) 0-15 (0-38) 0-27 (0-69)	20-30 (6-9)			
		PENNSYLVANIAN	LOWER AND MIDDLE PENNSYLVANIAN	Roaring Creek Sandstone of White (1903)			150 170	Shale, sandstone, coal, underclay, and flint clay. Shale, medium gray to black, some carbonaceous, evenly laminated. Sandstone, light gray, fine to medium grained, micaceous, crossbedded, thin to thick bedded; relatively low in quartz content. Coal, underclay, and flint clay occur in lenticular beds near base of formation.
				Coal bed (upper)			190-220	
				Coal bed (lower)		0-17 (0-43) 0-15 (0-38) 0-22 (0-56)	(58-67)	Sandstone, shale, and siltstone, predominantly sandstone, light gray to white, fine to coarse grained; lower and upper parts are thick bedded to massive, quartzose, cliff forming, and conglomeratic with well-rounded quartz pebbles ranging mostly from 1 to 3 cm in diameter. Middle part is thin to thick bedded and includes shale and siltstone lenses.
				Sewell(?) Coal bed		16-34 41-86	350-420	
				MISSISSIPPIAN	UPPER MISSISSIPPIAN	MAUCH CHUNK FORMATION		
								700+ (213+)

FIGURE 4 - Section exposed in the Dolly Sods Wilderness Area.
Source Englund, et al: 1980

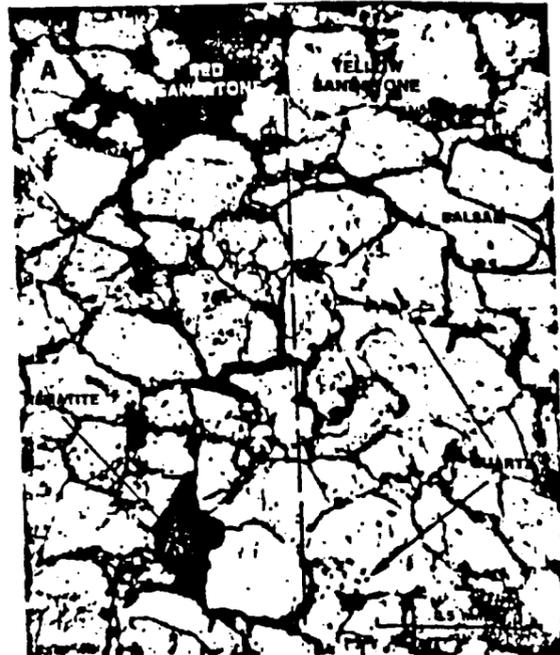
The angular specimens found are more likely related to the in-filling of fractures or joints in the rock. The rounded or glob-like specimens are called concretions and resulted from the in-filling of more rounded voids in the rock.

The deep red color of portions of the rocks suggest that the iron component is hematite. Other iron oxides could impart other colors to the rock, such as siderite which would be brown or brownish red (West Virginia Geological Survey 1909, p. 4-5, 10-11.) Siderite, also called iron carbonate, concretions have been noted as present in the Conemaugh Group (Reger, 1923).

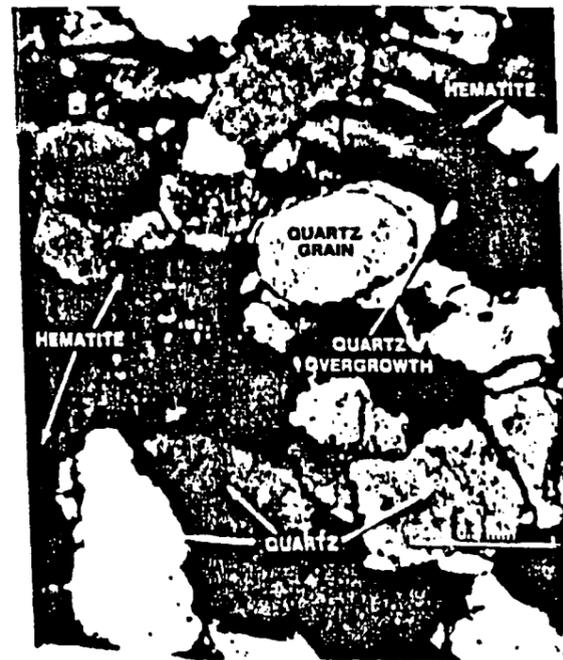
The fact that the North Crew found a number of these rocks on the surface near Blackbird Knob, suggests that we were near the outcrop of a rock member that contains iron-rich joints and concretions which have weathered out of the parent bedrock.

Linda Tracy, Monongahela National Forest geologist reported that she has observed similar rocks in areas of outcropping Pennsylvania-aged strata in and around the forest, such as in the upper Shavers Fork watershed in Pocahontas and Randolph Counties [Figures 5 & 6].

Literature and Forest Service records of prospecting permits reveal no commercial exploration activity for metallic-mineral occurrences in ore near Dolly Sods Wilderness Area. Direct field reconnaissance did not reveal any evidence of mining activity other than for coal. Records show that no significant metallic values were found in rocks sampled in the Dolly Sods Area. As earlier mentioned, several shale units along Red Creek are listed as containing iron ore, but after examination of shale outcroppings for iron, the concentrations were found to be sparse and of low grade. The iron concentration of one location tested revealed a reading as high as 32.6 percent, but because the occurrence in the area is limited to small scattered concentrations they cannot be considered iron ores. Red shales in the Dolly Sods Area were found to contain only 5-10 percent ferric-iron. Additional samples for iron content were also made on Sandstone from the Mauch Chuch and Allegheny formations. Atomic-absorption Analysis revealed an iron content of 0.4 -11.1 percent--too low a grade to be considered an economic source of iron. (Englund, et. al. 1980).



The contact between the red and yellow sandstones is fairly abrupt. The red color is due to hematite (iron oxide) filling the pore spaces between the quartz grains. There is no hematite cement in the yellow sandstone.



The rock is a medium-grained sandstone made up mostly of quartz. Hematite shows as a dark-rusty-red mineral in this photograph.



Fig. 5
p. 13

A Summary of the Origin and History of a Geologic Curiosity from a Report by Dr. Jack B. Epstein Geological Survey, U.S. Department of the Interior



Waffle Rock

Waffle Rock, so named by a visitor from the Corps of Engineers because of the similarity of its surface pattern to an oversized breakfast waffle, is a large boulder on display at Jennings Randolph Lake in Mineral County, West Virginia.

There have been numerous theories and speculations as to its origin, ranging from a pictograph made by prehistoric man, an Indian carving, the impression of the skin pattern of a giant lizard, or evidence of a visit to earth by an early traveler from outer space.

After examination of the phenomenon, Corps of Engineers geologists and those of other agencies have concluded that it is a natural geological formation. Although such formations are not common, similar patterned boulders were found on the east side of Tea Creek Mountain in Pocahontas County, West Virginia.

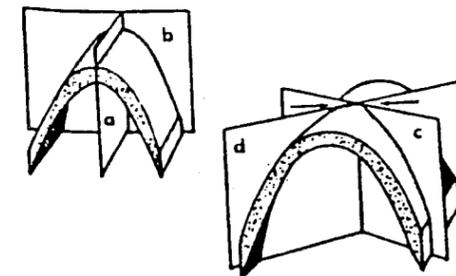
Dr. Jack B. Epstein of the Geological Survey, U.S. Department of the Interior, explained that the waffle rock is a part of the Conemaugh geologic series that was deposited about 300 million years ago during the Pennsylvanian Period. It is surmised that the waffle rock is a large loose boulder that fell from a parent outcrop somewhere higher up the slope, many decades ago, before the present trees grew.

Geologic studies suggest that sand was deposited by ancient streams and later consolidated into hard rock or sandstone. This sandstone and the layers or rock above and below it were thrown into large

folds during a period of mountain building, known as the Appalachian Orogeny, about 250 million years ago. During the upheaval, the rock was fractured into a regular pattern. Geologists refer to the fractures as joints. The waffle-like pattern or grid of the waffle rock was controlled by four separate sets or directions of joints. These fractures or joints can be seen in the centers of the raised ribs in the photograph below.

Four sets of joints are apparent in the waffle rock. Sets *a* and *b* are roughly perpendicular to each other; sets *c* and *d* are at an acute angle to each other. The stress that formed the joints, as well as the folds in the rocks, bisects the angle between joints *c* and *d* and is indicated by the arrows.

The illustration on the next page shows the relationship of folds and joints and the stress that formed them. Joint *a* is a



longitudinal joint parallel to the axis of the fold; joint *b* is a cross joint at right angles to the axis of the the fold; and joints *c* and *d* are oblique or conjugate joints at an angle to the fold axis. The direction of stress, shown by the arrows, bisects the acute angle between the oblique joints.

The accompanying photomicrographs of the waffle rock show how the rock appears under a microscope. The dark red parts that make up the ribs have the mineral hematite (iron oxide) as a cement between the quartz sand grains. The yellow sandstone lacks this hematite cement.

It is theorized that after the rock was fractured, the iron oxide was leached from the surrounding rock by percolating water and was deposited into the joints where it filled the voids between the sand grains, cementing them together extra strongly. The resulting dark red sandstone along the joints was more resistant to erosion and weathering than the surrounding rock and now stands as the grids of the waffle.

This then is the waffle rock; mixed, blended and baked by Mother Nature for the enjoyment of the observer.

PREHISTORIC BACKGROUND

A number of studies have been used to develop a tentative summary of the prehistory of the project area. These include Mc Michaels (1968) summary of West Virginia archaeology, Davis (1978), Niquette and Hand (1987), Brashler (1984), Brashler et al. (1987), Ledford et al. (1990), Gardner (1986), Walker and Hepner (1995), and Lesser (1993). Much information relating to the project area resulted from area surveys, a few small test excavations, and one large site excavation. As of 1993 (Anonymous) there were 86 prehistoric sites recorded for Tucker County and 110 for Grant County.

The following chronology is adapted from Gardner (1986), and Lesser (1993).

Paleoindian	9500 - 8000 B.C.
Archaic	8000 - 1000 B.C.
Woodland	1000 B.C. - A.D. 1600

Paleoindian Period (9500 - 8000 B.C.)

Paleoindian fluted points are the most widely recognized diagnostic of this period. They rarely occur in the Allegheny Plateau or the more rugged portions of the Ridge and Valley Province, however, they have been reported from adjacent counties and at the Green Thumb Site (46GB30) a high elevation site in Greenbrier County (Lesser and Brashler 1984a). At the nearby Mouth of Seneca Site (46PD1) a river terrace site in Pendleton County (Robertson 1996) a fluted point base was found, and two fluted points were found at a site near Judy Gap (Brashler et al. 1987). Paleoindian points found in the vicinity of the project are from the surface or disturbed contexts. In high elevation settings like the project area, Paleoindian populations were undoubtedly sparse.

Archaic Period (8000 - 1000 B.C.)

The Archaic Period in the Mid Atlantic region is traditionally divided into three sub-periods although there is not complete agreement on the duration of the segments (Niquette and Hand 1987, Brashler et al. 1978, Lesser 1993, Davis 1978, Gardner 1986). Here we will use our most recent segmentation (Lesser 1993) dividing the Period as Early Archaic (8000 - 6500 B.C.), Middle Archaic (6500 - 3000 B.C.), and Late Archaic (3000 - 1000 B.C.).

Early Archaic sites are found in the uplands, and become more common during and after the Kirk Phase (Lesser 1993, Wall 1981). A multicomponent site near the project area with an Early Archaic component is Brushy Ridge Site (46GT52). This site was identified as a base camp (Brashler 1984b), and Wall (1987) supported this function, adding that the site was situated on a bench part way up the Allegheny front to take advantage of resources in the valley and the rich upland bogs of Dolly Sods Wilderness.

Middle Archaic sites in the area include the multi-component high terrace sites evaluated by Brashler et al. (1987). Walker (1995) reported that Middle Archaic compared to earlier periods shows an increase in components and points, and that settlements range from valley floors to mountain tops. The Saddle Gap Site (46PH44) is a large high elevation Middle Archaic nut processing station (Lesser and Brashler 1984c).

Late Archaic has been characterized as a period of intensification, diversification, efficiency, and expanded exploitation of a wide range of environments, or "primary forest efficiency" (Caldwell 1958). Joe's Deer Scratch (46TU50) a high elevation Transient Station (Lesser and Brashler 1987) has a Late Archaic component and is within 100 yards of the project area (Brinker 1994). Brushy Ridge, within a mile also has a Late Archaic component.

Woodland Period (1000 B.C. - A.D. 1600)

The Woodland Period is marked by ceramics, burial ceremonialism, domesticated plants, trade networks, and increased sedentism. The period is divided into Early (1000 - 300 B.C.), Middle (300 B.C. - A.D. 500), and Late (A.D. 500 - European Contact) (Lesser 1993). The later portion of the period is also known as Late Prehistoric.

The characteristics that mark the beginning of the Early Woodland are generally confined to certain geographical areas, such as, major river flood plains and terraces. Early Woodland diagnostics are rarely found in the uplands. However, the mountains are likely to have served as resource procurement areas during this and subsequent prehistoric times.

Middle Woodland is marked by burial mounds, earthworks, and extended trade networks. As in Early and Late Woodland, Middle Woodland sites are mostly in river valleys (Maslowski 1985), with limited use of the hinterlands. One site with a Middle Woodland component near the project area is Mouth of Seneca Site (46PD1) first investigated by Fowke (1894) and most recently by Robertson (1996).

Late Woodland is characterized by a greater dependency on agriculture in the river valleys and by a utilization of the uplands

to procure other resources (Brashler et al. 1987). Wall (1987) suggested that Late Woodland sites are rare west of the Allegheny front. Brushy Ridge (46GT52) on the eastern slope of the Allegheny Front has a Late Woodland component. A Late Prehistoric farming village site, Mouth of Seneca (46PD1) is near the project area (Robertson 1996), and an early contact farming village (46HM73) is located along the same river in Hampshire County (Becker 1987, Brashler 1987, Egan 1987).

In conclusion, there are prehistoric sites in the vicinity of the project area [Figures 7 & 8]. Brushy Ridge Site (46GT52) is an upland base camp containing materials from Early Archaic through Late Woodland (Brashler 1984b). Joe's Deer Scratch (46TU50) is a transient station probably associated with a travel route crossing the Allegheny Front at a low gap (Brinker 1994). Wall (1981) found that upland bog areas were heavily used in prehistoric times, and this surface survey discovered lithic scatter adjacent to a bog, but outside the project area.

One previously recorded prehistoric site, Bear Rocks 46TU41 is located in the project area within 1/4 mile of the crest of the Allegheny front, as in 46TU62. With no prehistoric sites found in the Dolly Sods Wilderness and only two prehistoric sites in Dolly Sods North, it appears that Wall's (1987) observation that Late Woodland sites are rare west of the Allegheny front may hold for other prehistoric periods as well.

With this information, we did expect to locate additional prehistoric sites in the project area, but did not. The nature of the survey methods may have precluded finding them. The survey was confined to the proposed impact area, a narrow corridor on either side of existing trails, and opportunistic camp sites. The survey area did not necessarily coincide with prehistoric high probability areas, but rather historic high probability areas. Most trails are old railroad grades or logging roads, and camp sites are usually on flat areas once used for log landings, logging camps, or saw mills. Thus, any prehistoric sites that might have been here would have been destroyed, or, at best, disturbed by these subsequent activities.

Survey methods were limited to visual inspection for obvious safety reasons. The Dolly Sods North Scenic Area contains lush vegetation, and was surveyed in the summertime. We assume that small sites with limited material remains would be missed absent shovel testing. Therefore, we conclude that prehistoric sites (if they do exist in the proposed project impact area) are disturbed, destroyed, or insignificant. We may have had more productive results had we designed the survey to fully address higher probability areas.

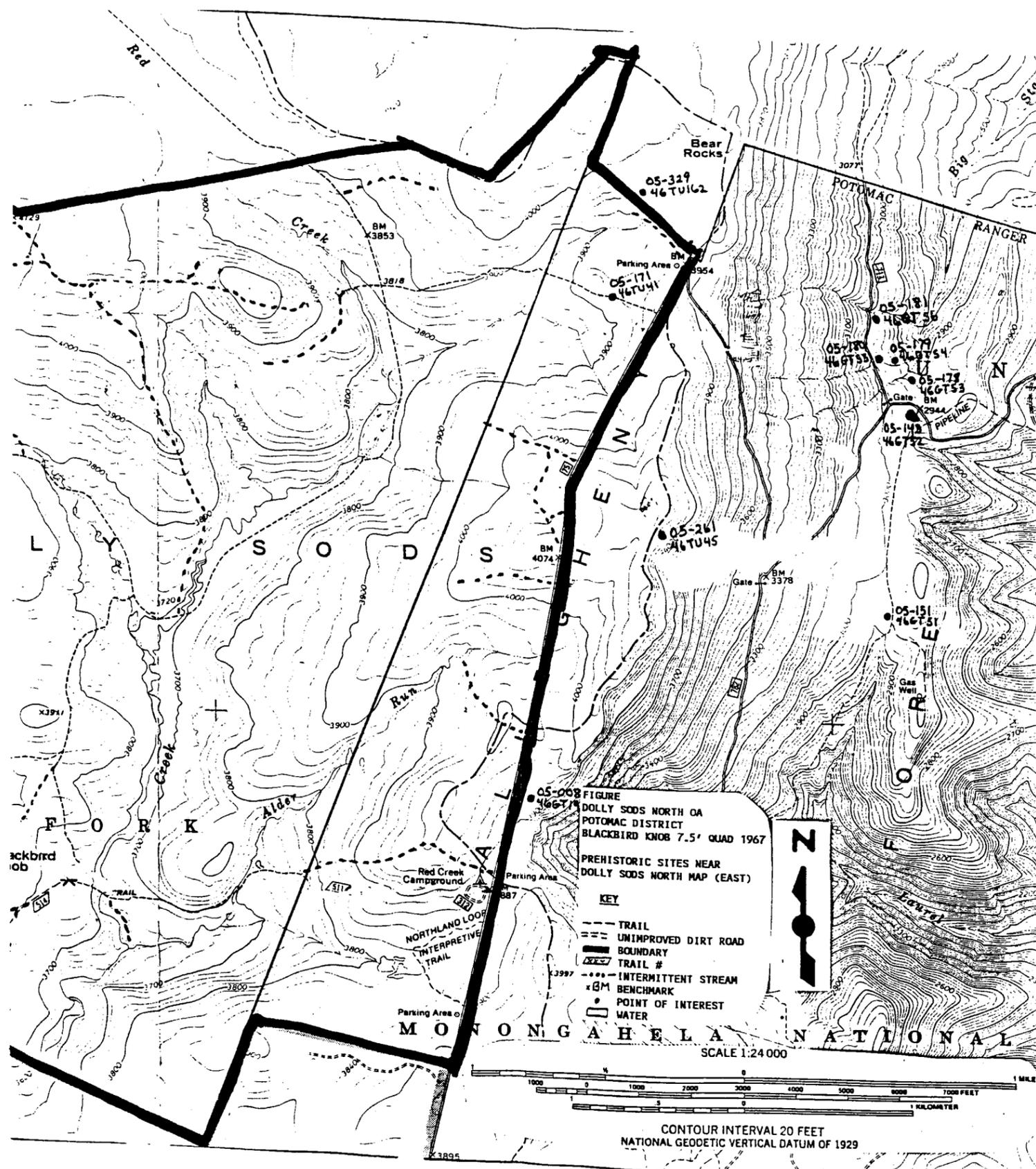


Fig. 7
 p. 18

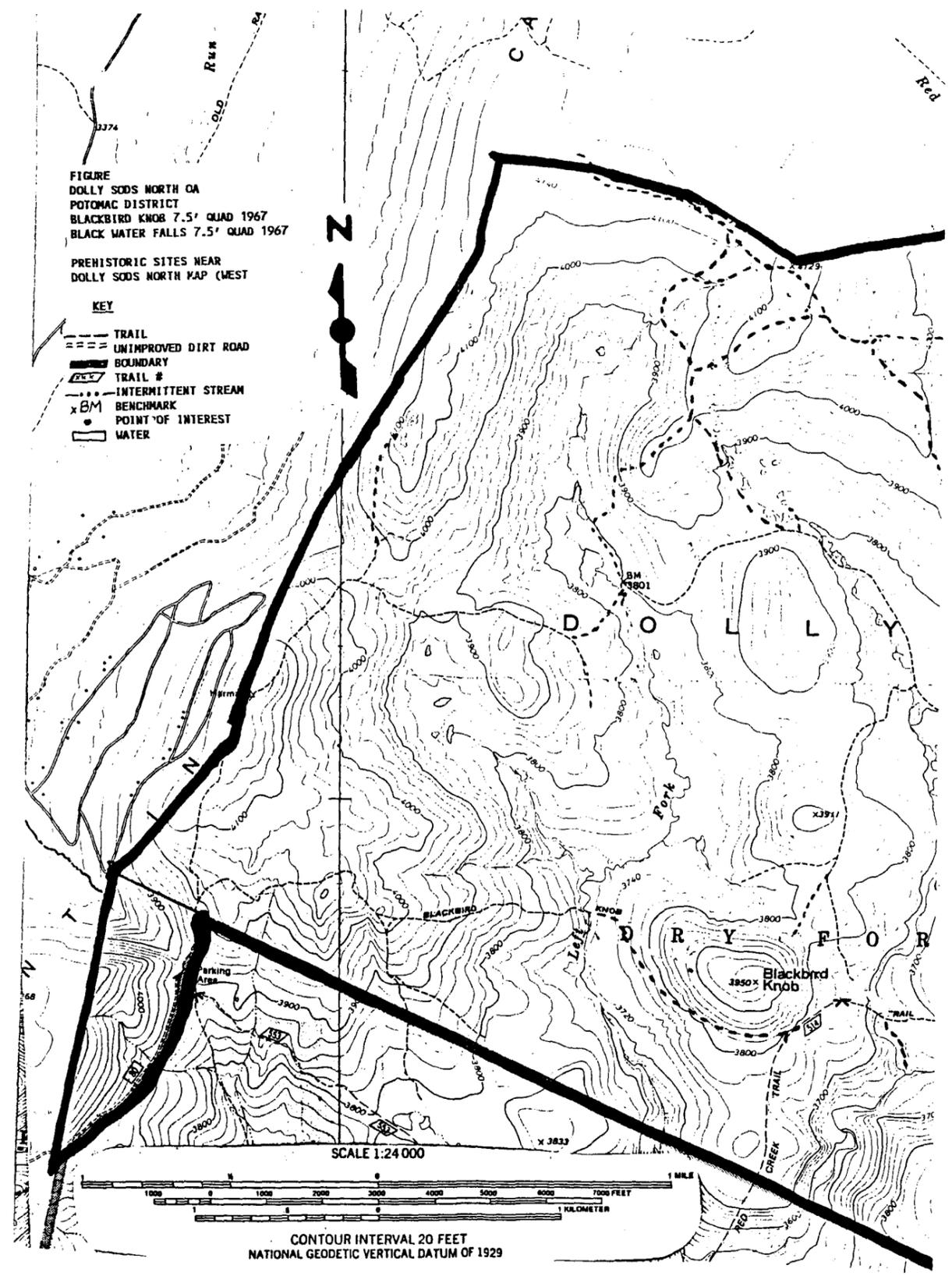


Fig. 8
 p. 19

PREHISTORIC SITES CLOSE TO DOLLY SODS NORTH

Site Name: none, 09-21-05-008, 46 GT 19, was recorded 12-30-77. Slight scattering of points and flakes, revised 09-12-90.

Site Name: Bear Rocks, 09-21-05-171, 46 TU 41, was recorded 08-06-86. Chert debitage scattered across low spot in jeep trail, continuing toward FR# 75. One small projectile point recovered. Initially unevaluated for National Register but in 1996 was reevaluated and found noneligible.

Site Name: Bob Marley Rock Shelter, 09-21-05-261, 46 TU 45, was recorded 04-20-92. Lithic scatter in rock shelter.

Site Name: Berg Junction Site, 09-21-05-151, 46 GT 51, was recorded 06-20-86. Surface scatter over ca. 1.5 - 2 acre area.

Site Name: Star Run #1, 09-21-05-178, 46 GT 53, was recorded 09-23-87. Lithic debris, single chert tempered shred, revised 08-27-90.

Site Name: Star Run #2, 09-21-05-179, 46 GT 54, was recorded 09-23-87. Lithic debris, revised 08-27-90.

Site Name: Star Run #3, 09-21-05-180, 46 GT 55, was recorded 09-23-87. Small lithic scatter, revised 08-27-90.

Site Name: Star Run #4, 09-21-05-181, 46 GT 56, was recorded 09-23-87. Lithic debris, thumbnail scraper, revised 08-27-90.

Site Name: Brushy Ridge Site, 09-21-05-143, 46 GT 52, was recorded 06-20-86. Numerous prehistoric debitage scattered across site surface, revised 11-29-90.

HISTORICAL BACKGROUND

Settlement

The earliest European settlers arrived in the area that would encompass the State of West Virginia in the mid-to-late 1700s (Clarkson, 1964). The Settlement in what was to become the Monongahela National Forest, like that of the rest of the State, predominately occurred along major river valleys such as the South Branch of the North Fork of the Potomac, Tygart, Cheat, and Greenbrier Rivers.

It is unclear when the first white explorers ventured into this territory now part of the Monongahela National Forest, but according to Callahan's Semi-Centennial History of West Virginia (Callahan 1913), an expedition lead by Lieutenant-Governor Alexander Spotswood of Virginia reached the Pocahontas County area in 1716. It is very probable that other explorers, including Indian traders, traveled through this region along well established Indian trails. However, the earliest known recorded account of an expedition into the Western Virginia wilderness is the account of the William Mayo survey party which was employed by the English government to map and survey the headwaters of the North Branch of the Potomac River in 1736. Shortly following this survey, Lord Fairfax of Virginia claimed a large portion of this land in the Fairfax Grant and placed his western most boundary marker, known as the "Fairfax Stone," in this area in 1746 (Davis, 1978). Today, this stone marks the boundary between Maryland and West Virginia and is located approximately 15-20 miles north west of Laneville near the Dolly Sods North Area.

Although a majority of early settlement activity was centered in the major river valleys, expansion progressed steadily along the tributaries of these primary waterways. The earliest settlements within the Monongahela National Forest lands occurred prior to the 1800s. Due to the isolation from other, more distant communities, and the threat from Indian attack, many of these early settlements were established as fortified communities or abandoned following successful Indian raids. Stories of similar settlement successes and failures dominate the history of West Virginia and can be found in close proximity to the Dolly Sods region along the Cheat and Tygart River valleys. Although no homesteads were found in Dolly Sods North, the typical homesteads found adjacent to the area, such as Bill's Lost Retreat, 46TU158, exhibit similar characteristics to those found elsewhere on the National Forest that post-date the Civil War period (Whetsell, et al., 1996). It is believed that many of these homesteads fall predominately within the 1870-1900 time frame and correlate with the introduction and rise of the lumber and railroad activities within the region. It is known that one of the first inhabitants of the area was the pioneer Dahle family. This family surname was later changed to "Dolly" of Dolly Sods (Maxwell, 1880).

Lumber and Logging History

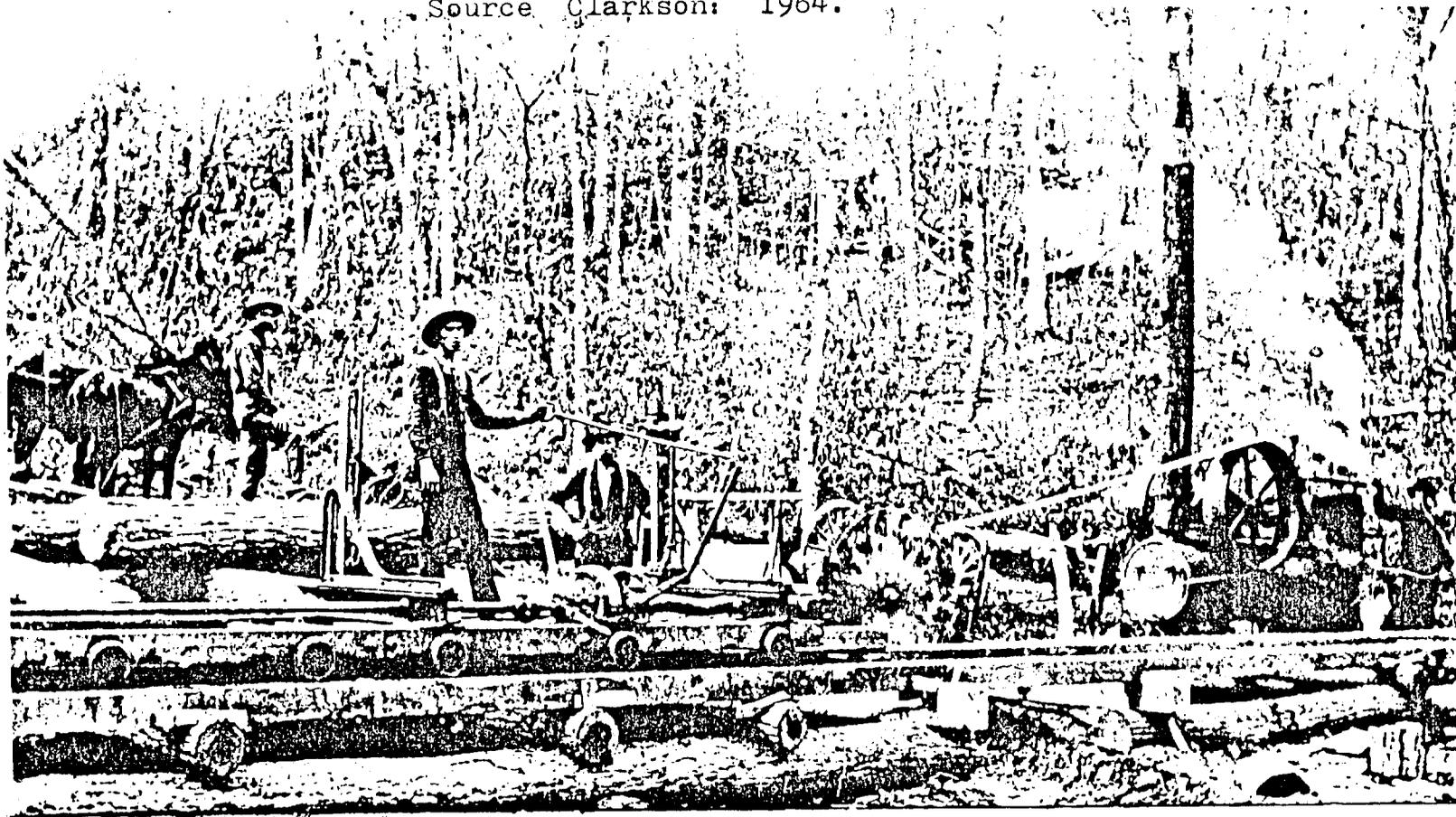
The first sawmill West of the Allegheny Mountains was reportedly constructed in 1776 by John Minear at St. George in Tucker County, WV (Clarkson, 1964). One of several water-powered sawmills built in the area, most were combined with gristmills and became the focal point of community activity for multitudes of local inhabitants. The use of water-powered sawmills increased productivity from 100-linear feet of wooden plank per day using the traditional two-man whipsaw to an impressive 500-linear feet per day (Clarkson, 1964). Even with the improved speed and productivity, the water-powered saw was not dependable and earned it the nickname "up today and down tomorrow" saw. Additional improvements in technology, such as the development of the "muley-mill," doubled the productivity by increasing the output of the mills to 1,000-feet a day (Clarkson, 1964:16).

The next step in the evolution of the sawmill operation took place in 1777 when an Englishman, named Miller, introduced the first circular saw (Clarkson, 1964). It would be nearly a century before the circular saw would come to the woods of West Virginia.

The circular sawmill power came from a large steam boiler. A large belt, connected to the saw apparatus and powered by the boiler, rotated the circular saw blade at fantastic speed while a flat carriage was used to feed the log into the saw blade. Steam also powered the machinery used to propel the carriage along its rail track [Figure 9]. With the vast improvement in speed and their ability to be moved to previously untouchable stands of virgin timber, the circular sawmills began their assault on West Virginia's primeval forests of red spruce, yellow poplar, hemlock, and white oak. Among the largest stands of red spruce found in the State were along the headwaters of Red Creek in what is today the Dolly Sods North Area (Clarkson, 1964). Numerous circular sawmills were operated within and around the Dolly Sods area throughout the height of the lumber boom between the mid 1880s to the early 1900s. The introduction of the multi-blade circular sawmill, or "gang saw," consumed millions of board feet of lumber a year. In the case of the St. Lawrence Boom and Manufacturing Co., at Ronceverte, for instance, the mill maintained a gang saw containing thirty-two blades which made a total of 215 strokes per minute. This speed gave the mill an average sawing capacity of 120,000 feet of lumber a day in 1883 (Clarkson, 1964).

The introduction of the railroad into the area increased the number of portable circular sawmills which were needed to satisfy the ever increasing demand for timber products to build the new towns springing up alongside the new railroad lines. By 1880 West Virginia ranked 12th in the number of lumber operators (472), 21st in number of

Fig. 9 —De'cab Kennison's sawmill, typical of the small portable circular steam mills in operation in West Virginia. Pocahontas County, 1910. *Courtesy John Hayes.*
Source Clarkson: 1964.



employed laborers (3,765) and 24th in the production of lumber annually (180,112,000) (Clarkson, 1964:21).

The last major innovation which sealed the fate of the large stands of timber and sped the rate of their demise came from the introduction of the band saw mill. Although tremendous in size, capacity and more technologically advanced than the gang sawmills, the band saw mills were similar to previous mills in the respect that they were powered by steam. The differences were many.

Unlike a revolving circular saw blade, the band saw is an endless belt of steel, having teeth on one or both edges, traveling at great speed around an upper and lower pulley. The latter is attached by belts to a steam engine which drives the saw. The logs are carried past the saw on a carriage which is run, like that of the circular saw, by steam piston. (Clarkson, 1964:23). Two of these sawmill types operated in the Dolly Sods area [Figure 10]. (1) The Kerstetter mill in Randolph County, owned by the Wyoming Lumber Company (later owned by the Dry Fork Lumber Company), and (2) the larger Laneville mill near the Randolph/Tucker County line [Figure 11], owned by the Parsons Pulp and Lumber Company. Both of these mills, particularly the Parsons Pulp and Lumber Company, maintained several Shay locomotives [Figures 12-15] to transport the logs to the mill pond located at Laneville. Because of the necessity of the mill pond to the band saw mill operation, the majority of these mills were found along primary streams and rivers in order to supply a constant flow of water to allow for the floating, cleaning and easy movement of the logs to the mill's "jack-slip" or inclined gangway. At the jack-slip the logs would be pulled by "bull-chain" into the mill, measured and recorded, and onto the saw carriage for sawing. The cut lumber and staves produced from the mill would be trimmed and stacked according to size and quality to dry in the large lumber yard to await transportation by locomotives to buyers.

The town of Laneville was founded in 1902 following the construction of the Red Creek extension by the Parsons Pulp and Lumber Company to Red Creek Junction, on the Dry Fork Railway (Clarkson, 1964). Laneville was established on Red Creek of the Dry Fork branch of Cheat River as the terminous of the line and a single-band sawmill was erected at the site. Situated on the Randolph/Tucker County line, the mill was built across Red Creek in Randolph County while the majority of the associated houses for the mill employees were located in Tucker County. The mill was upgraded several years later to a double-band mill with a capacity of 125,000 board feet of lumber production in a ten-hour day. The community was incorporated in 1909 in order to enable the citizens to vote the saloons out of the newly formed town. The motion passed and was enacted making Laneville a "dry" town (Clarkson, 1964). The saloons moved to Kerstetter also known as Wyoming where they continued to dispense alcohol on

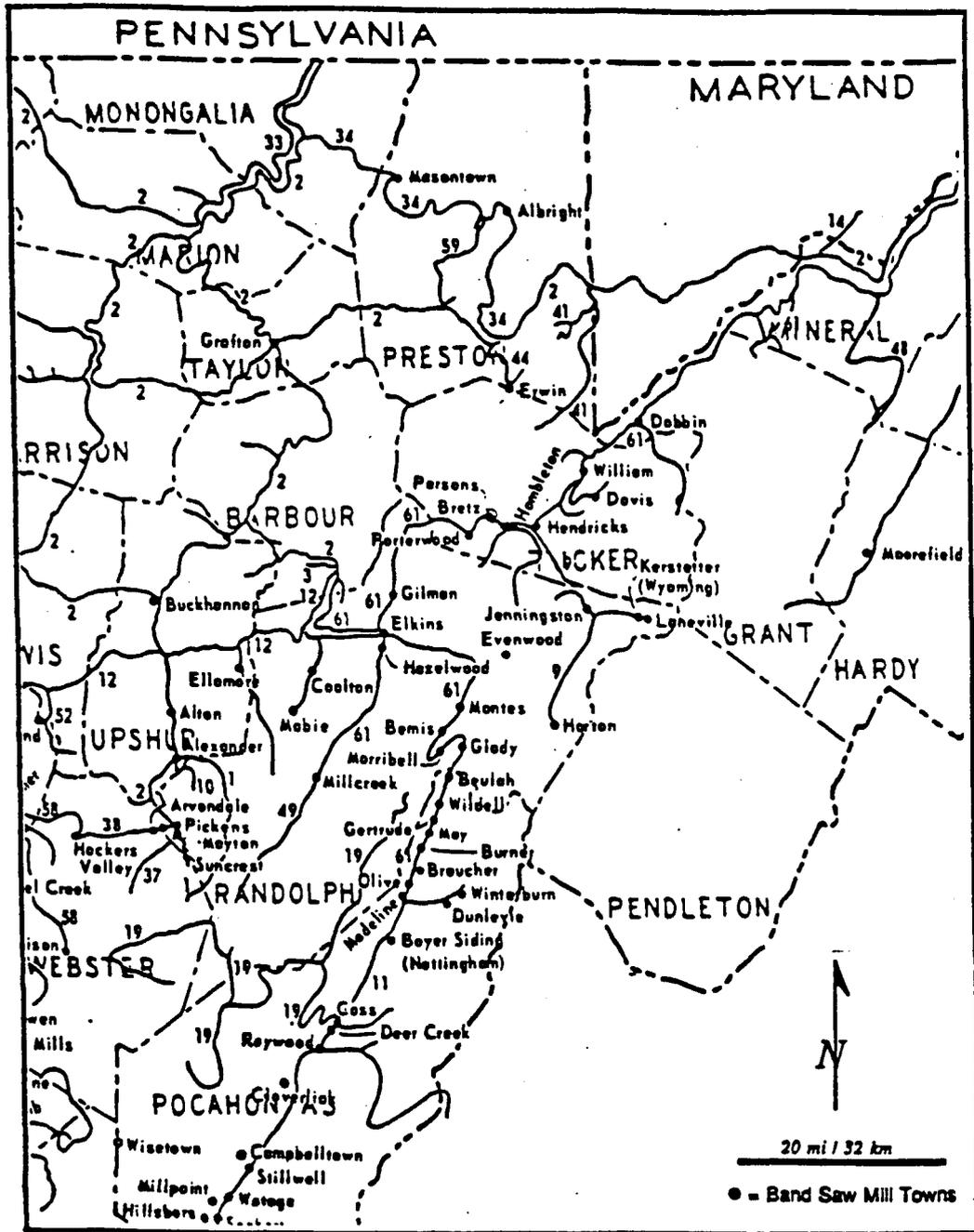


Fig. 10
 Portion of the Clarkson (1964) Map showing major railroads in 1917
 and band saw mill towns from 1875 to 1920
 Source Clarkson: 1964

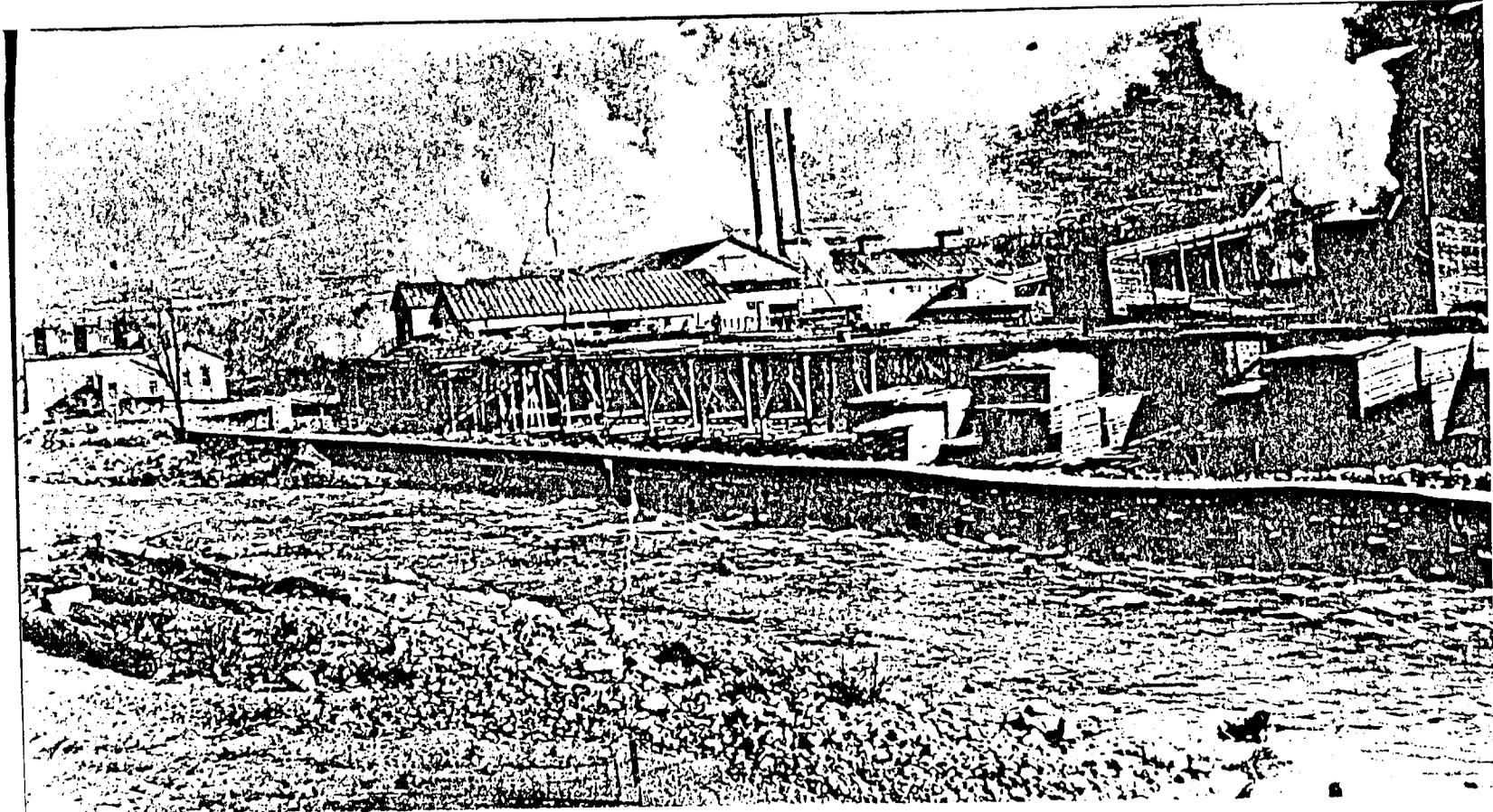


Fig. 11—Large band mill of the Parsons Pulp and Lumber Co., Laneville,
Tucker County, 1910. Courtesy Frank Harr.
Source: Clarkson: 1964.

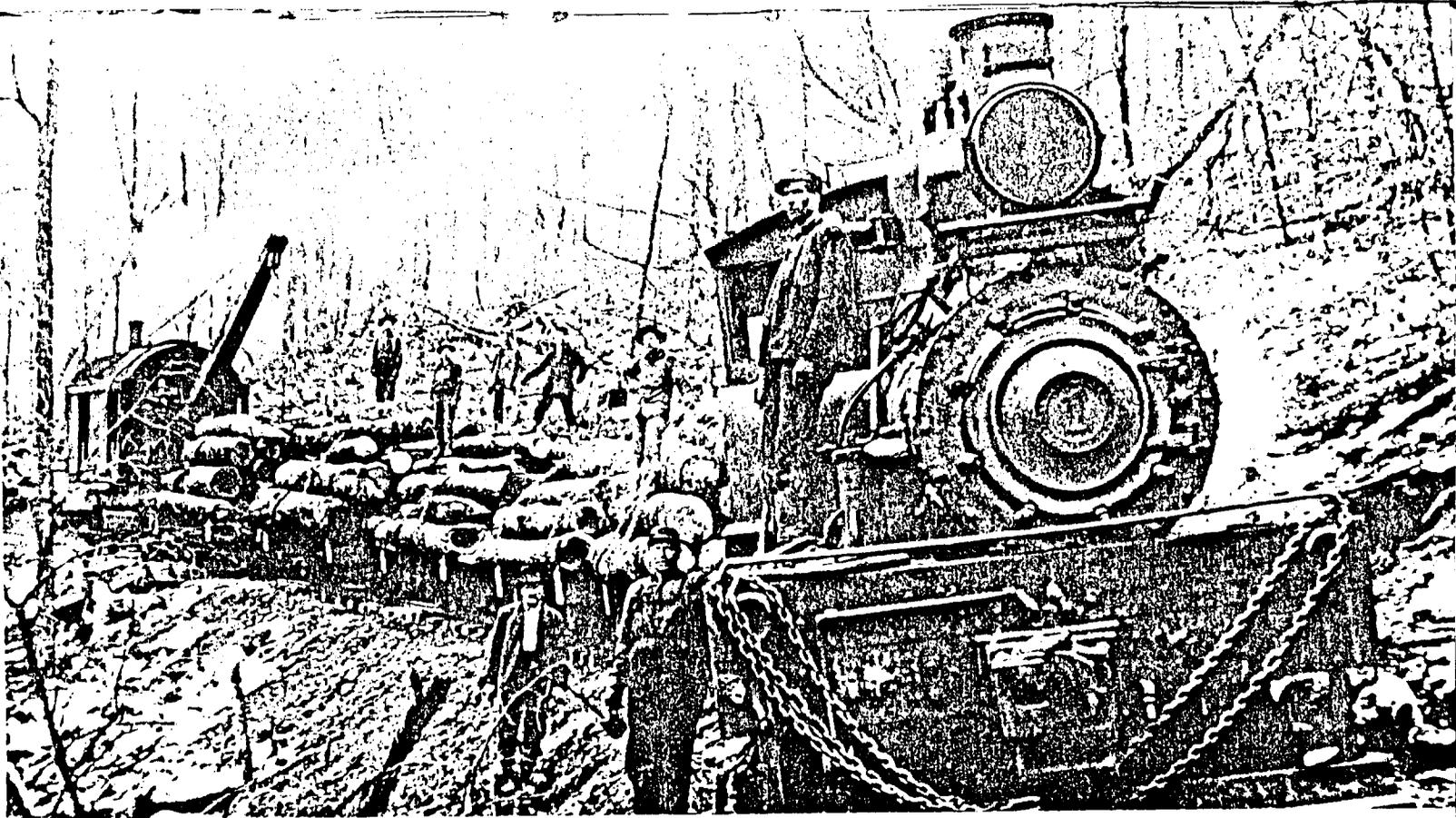


Fig12 —Shay No. 1 of the Parsons Pulp and Paper Co., Laneville, Tucker County, 1910.
Note the offset boiler due to the cylinders all being on one side. *Courtesy Boyers Clark.*
Source: Clarkson: 1964

Fig. 13—Shay No. 6 of the Parsons Pulp & Lumber Co., Laneville, Tucker County,
1910. Courtesy Frank Harr.

Source: Clarkson: 1964

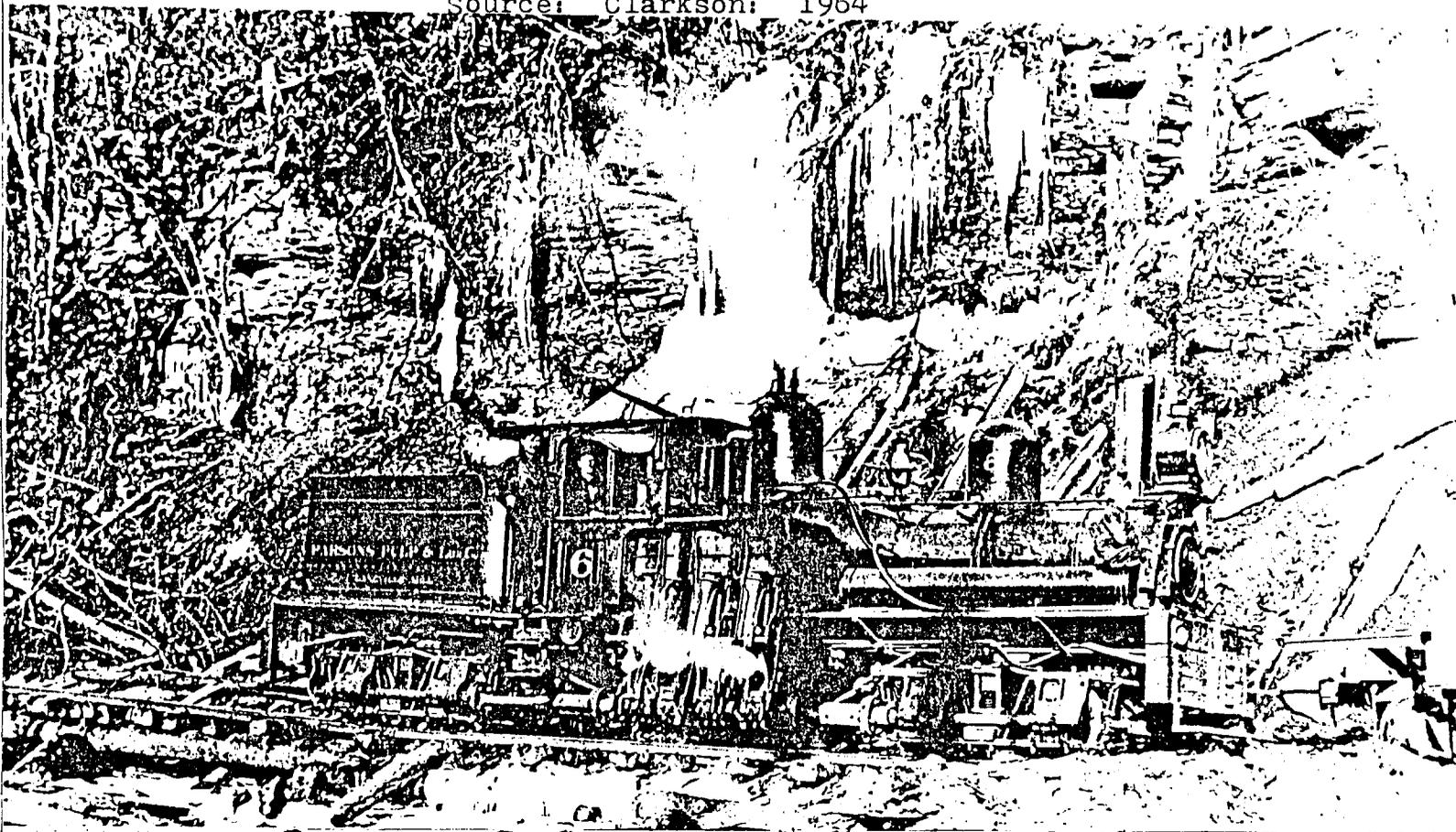
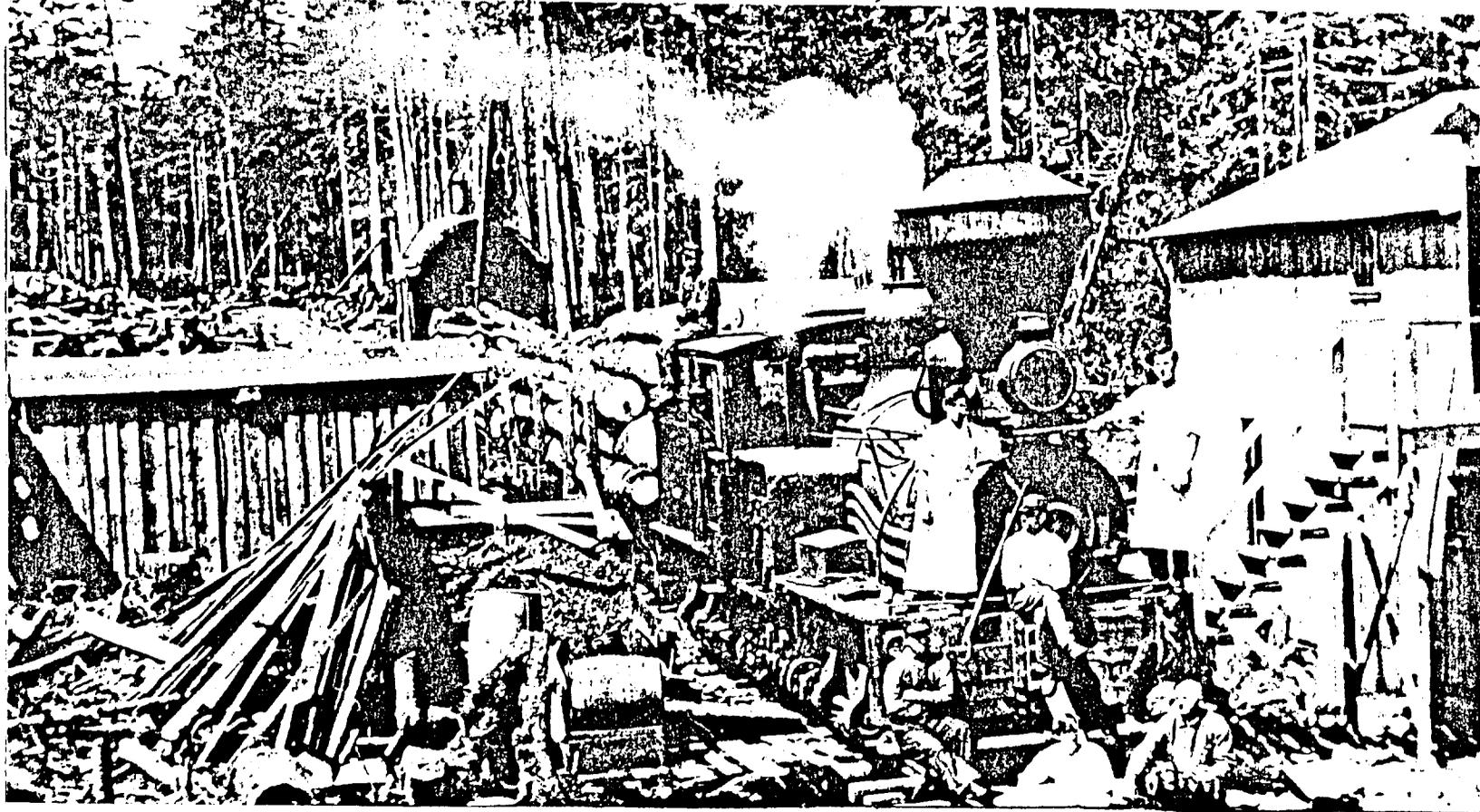


Fig. 14—Shay engine and log loader at the upper camp on Red Creek, 1910. Parsons Pulp and Lumber Co., Laneville, Tucker County. *Courtesy Frank Harr.*
Source: Clarkson: 1964



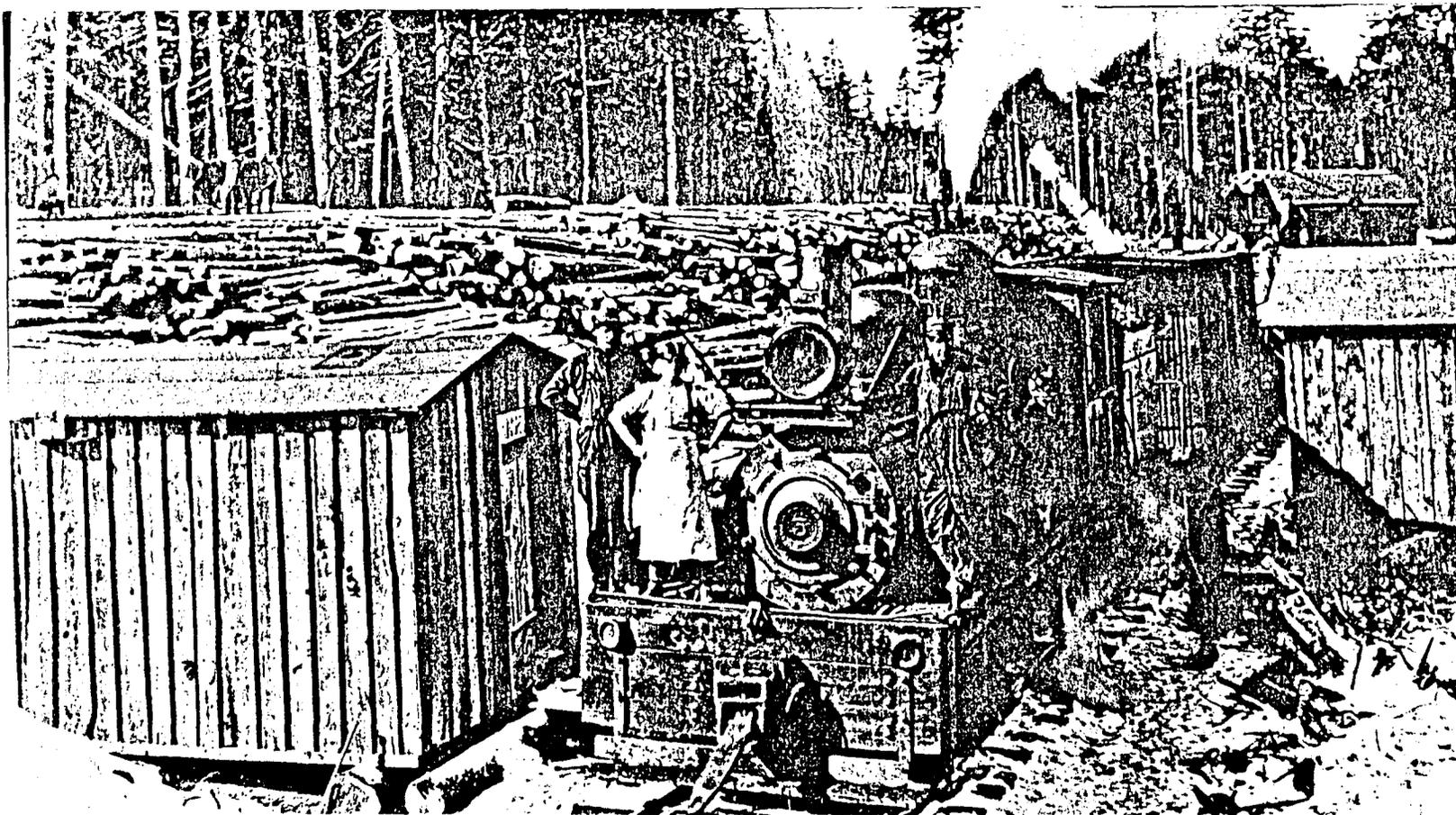


Fig. 15—Shay No. 5 of the Parsons Pulp & Lumber Co. in front of a huge log landing at the upper camp on Red Creek, Tucker County, 1910. *Courtesy Frank Harr.*

Source: Clarkson: 1964.

weekends to the thirsty lumbermen, also known as "woodhicks," who worked in the logging camps at the headwaters of Red Creek [Figure 16]. In 1910, the population of Laneville was 333 and was later reported at 102 in 1920. During its height, according to J.J. Judy, 1923 Postmaster of Laneville, the population of Laneville was approximately 1,500 (Reger 1923:18).

The Parsons Pulp and Lumber Company began operation in 1900 as the Parsons Pulp and Paper Company but later reorganized under the new name in 1909-10. The head office for the company was at 1807 Finance Building, Philadelphia, Pa., but maintained its main pulp and paper mill on the Shavers Fork of the Cheat River in southeast Parsons, WV. Besides cut lumber, the Laneville plant supplied pulp wood for the Parsons plant. The Parsons plant, in 1923, employed 150 men with a monthly payroll of \$15,000 and produced a pulp capacity of forty-five tons every twenty-four hours (Clarkson, 1964). In addition to the Laneville mill, a mill at Horton also supplied spruce and hemlock used in the production of pulp.

Between 1870, when J.H. Diss Debar estimated that at least 10,000,000 acres of original growth forest existed in all of West Virginia, and 1920, when all but a few sparse acres of isolated timber remained, the state had gone from containing one of the most valuable reserves of virgin timber stands to a clearcut wasteland virtually devoid of large trees. It has been estimated that during this period more than 30 billion board feet of lumber was cut in the State (Clarkson, 1964). To attach a visual image, 30 billion feet of lumber would build a board walk 127 feet wide and 2 inches thick around the Earth at the equator or would make a walkway 13 feet wide and two inches thick the average distance to the moon (Clarkson 1964:38). The peak year of production during this frenzied activity occurred in 1909 with 83 band sawmills and 1,441 other lumber establishments operating in the State and producing 1,472,942,000 board feet--making West Virginia 13th in national output of lumber for that year [Figure 17]. Before that year, however, much of the dense spruce and hemlock forests of the Dolly Sods region had been felled and turned to lumber and pulp.



Figure 16:
"PEG-LEG" CAMP ON RED CREEK, TUCKER COUNTY. THE POSTS UNDER THE LOWER SIDE OF
THE CAMP WERE 12 FT. HIGH, HENCE THE NAME. CA. 1910.

Source: U.S. Forest Service, Elkins WVa.

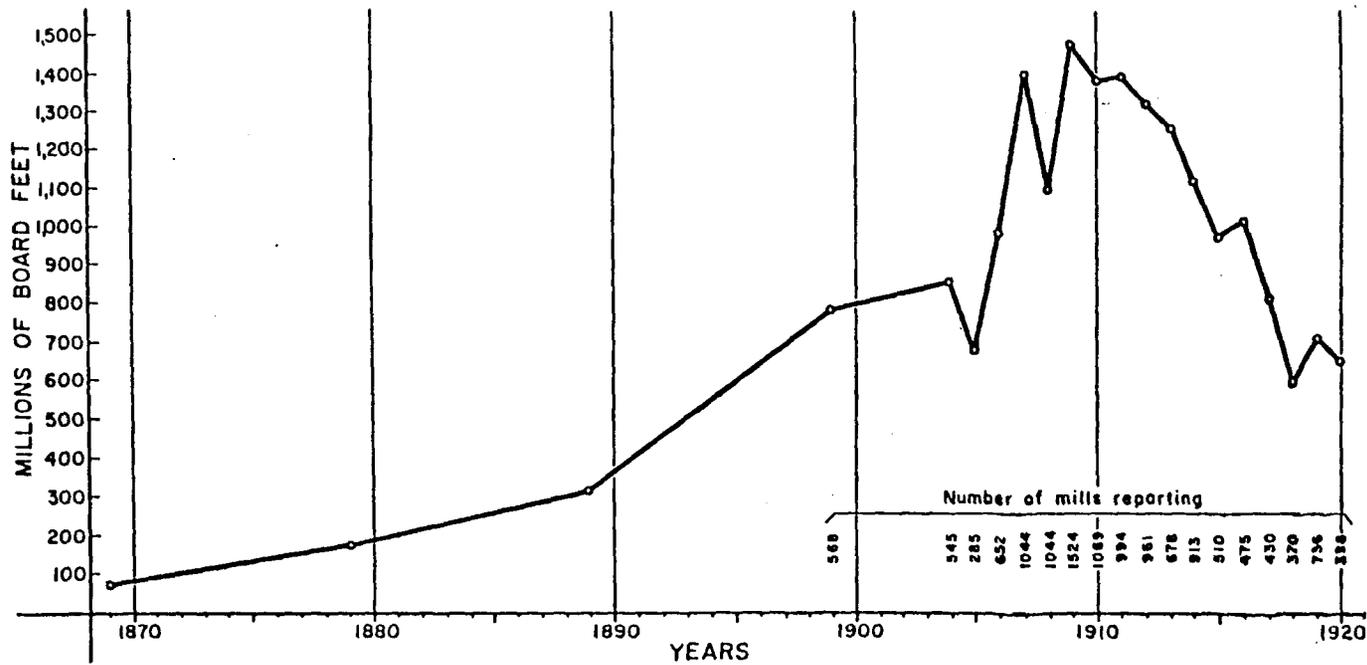


Fig. 17 Total production of lumber and number of mills reporting, West Virginia, specified years, 1870-1920.

Source: Clarkson: 1964.

HISTORIC SITES CLOSE TO DOLLY SODS NORTH

Site Name: none, 09-21-05-009, no state number , was recorded 12-30-88.

Site Name: Las Tres Casitas, 09-21-05-010, no state number , was recorded 12-30-77, partially intact log structures, whiteware, blue glass, and nail.

SITES FOUND IN DOLLY SODS WILDERNESS (Whetsell, et al., 1996.)

Site Name: Shay Falls, 09-21-05-312, 46 TU 151, was recorded 05-22-96, metal parts, coal, and porcelin shards.

Site Name: North Crew Logging & Mine Co., 09-21-05-313, 46 TU 152, was recorded 05-30-96, numerous iron pieces, stoneware, glass and foundations.

Site Name: Bill's Rockwall, 09-21-05-314, 46 TU 153, was recorded 05-20-96, man-made rock wall.

Site Name: Lisa's Stovetop Retreat, 09-21-05-315, 46 TU 154, was recorded 05-21-96, metal objects, stoneware, bottles and campsite.

Site Name: North and South Rainy Day, 09-21-05-317, 46 TU 156, was recorded 05-28-96, metal objects, glass and stoneware.

Site Name: Bill's Lost Retreat, 09-21-05-318, 46 TU 158, was recorded 05-09-96, coal mine and foundations.

Site Name: Digger Coal, 09-21-05-319, 46 TU 157, was recorded 05-09-96, two coal mines, metal pieces and wooden poles.

Site Name: Bits & Pieces, 09-21-05-321, 46 TU 159, was recorded 05-07-96, iron parts, red brick, and log bridge in adjacent stream.

METHODS

Research

All files pertaining to site and reconnaissance reports in and near the Dolly Sods North Area were examined to learn more about the area and to prevent redundancy in record-keeping. All inventory and reconnaissance reports that were searched are located at the Monongahela National Forest Supervisor's Office in Elkins, West Virginia. We also read and used reference materials pertaining to prehistory, early settlement, geology, and logging available at the Forest office, local libraries, and in private collections. Some information was also gained through personal communication.

Artifact Analysis

To identify historic artifacts and discover their significance, several historical texts were reviewed, the most commonly used was Roy Clarkson's (1964) book "Tumult on the Mountain". Most artifacts were assumed part of the logging industry because of the use of heavy equipment for logging purposes during the turn of the century. Also, metal pieces found in the area were determined to be associated with the military training in the area.

Field Methods

Normal procedures for discovering prehistoric sites were not followed because of the possibility of detonating unexploded ordnance. Ordinarily shovel testing is a common method, however, impacting the ground near a live shell could cause considerable personal damage. Also, since the survey was restricted to a 40 foot corridor along the trails we did not access high probability areas located off the trails.

Field examination of the area was conducted by walking and visually examining 100% of the official US Forest Service trails located within the north area. Also, all campsites near the trails were checked for artifacts, since many campers reuse historic items for camping items. Because several of the current trails were previously used as logging grades, visual inspection was directed at locating and documenting railroad associated sites. When sites with no clear provenience were discovered, a search of the area was made to ascertain exactly what type of activity took place in the vicinity and the extent of its boundaries.

In searching the trail system, visual checks were made 20 ft. on either side of the trail system, which is 23 miles long. This, plus the campsites totalled 114 acres of land searched. This field

reconnaissance required three weeks to complete, and four Forest Service personnel were used [Figures 18-21].

When sites were located, a reading was taken by a GPS, or Global Positioning System unit for reference to locations. All coordinates were recorded to allow US Army Corps of Engineers workers to identify sites at a later time. The coordinates were stored on a diskette, and the results printed for visual reference.

Backcountry reconnaissance was hindered by several factors. The weather was extremely wet for a period of time. Rains caused many streams and rivers to flood, making them dangerous to cross. The poor drainage of the soils caused muddy trail conditions most of the time. Also, topographic maps were incorrect due to trail changes. The date on many features of the maps were 1967, and have been slightly modified in more recent times. However, many trails that are on older maps do not exist on the ground now, and new ones have been added. A remedy for this was the Monongahela National Forest Hiking Guide, published by the West Virginia Highlands Conservancy. This manual was important during the survey of the Blackbird Knob Trail in the southern portion of Dolly Sods North. The trails on the maps in this publication have been corrected to modern standards, and trail descriptions were given for good reference.

Many of the trails hiked were retraced in order to get into new areas. A former railroad grade along upper Red Creek was a main corridor, as well as Blackbird Knob Trail, which lies just north of the Dolly Sods Wilderness. Much time was lost due to this back-tracking, however, no other portals could be used for conducting the survey.

Road conditions varied when attempting to access sites. Forest Road 75 (the Dolly Sods Road) was rough, but passible with any type of vehicle. Former Forest Road 80 (now the Timberline Road) was impossible to access, except with a high clearance vehicle. Several muddy spots were very deep, and wet conditions made them extremely difficult to get through. Also, with two major roadway slips, any vehicle wider than a pickup truck would not be able to pass through. The bank on the sides of the road is extremely narrow in two locations.

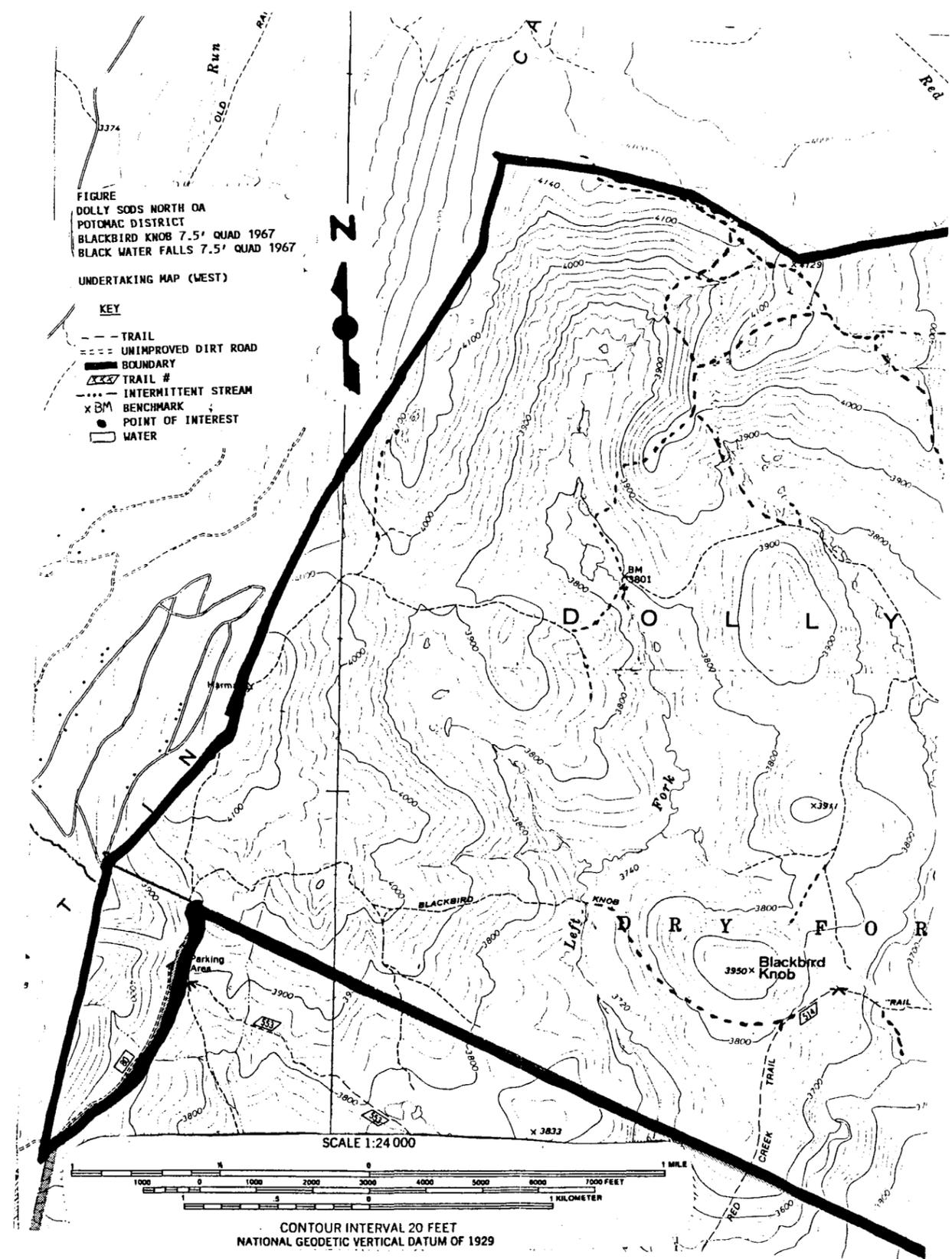


Fig. 19
 p. 38

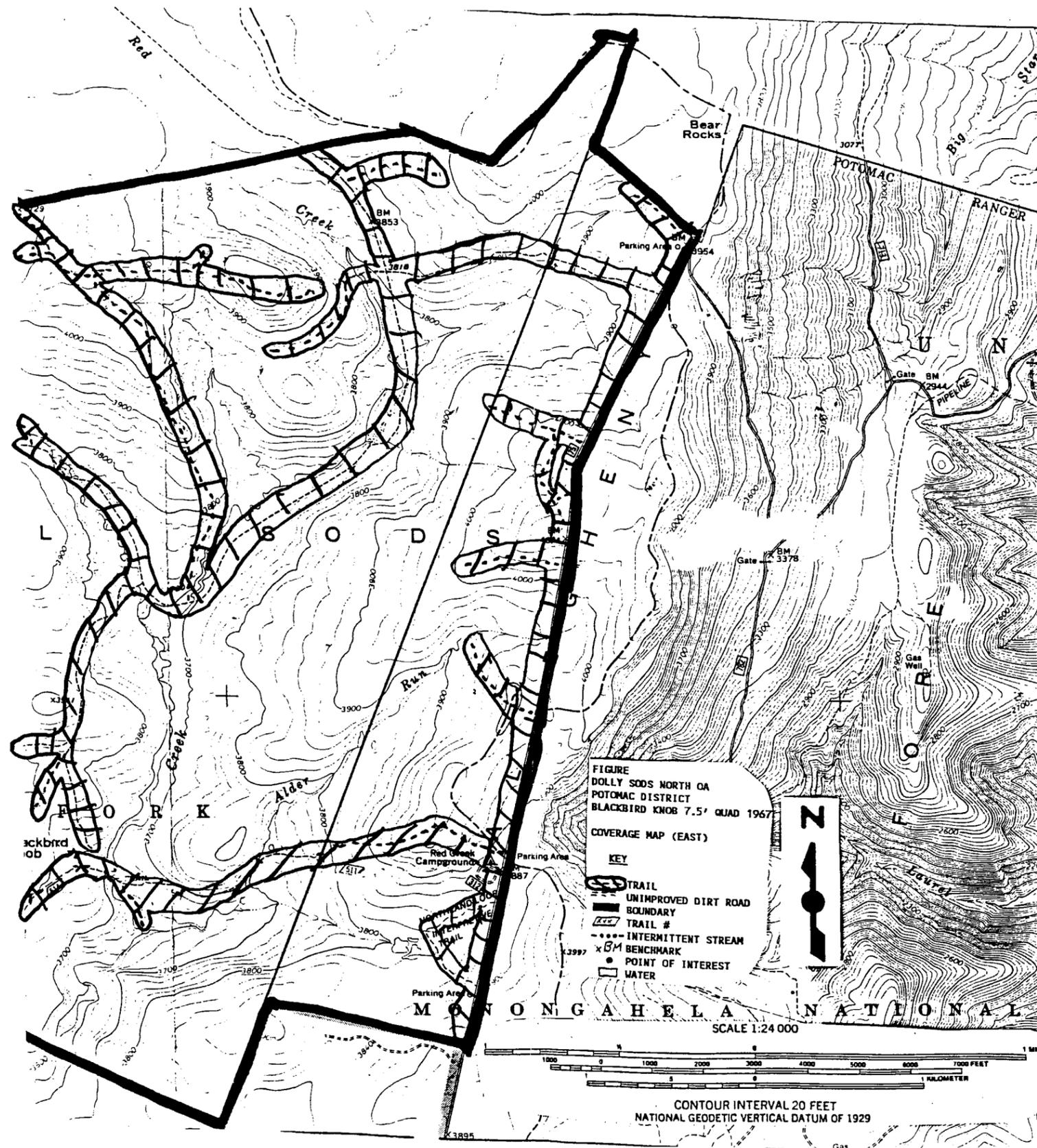


Fig. 20
 p. 39

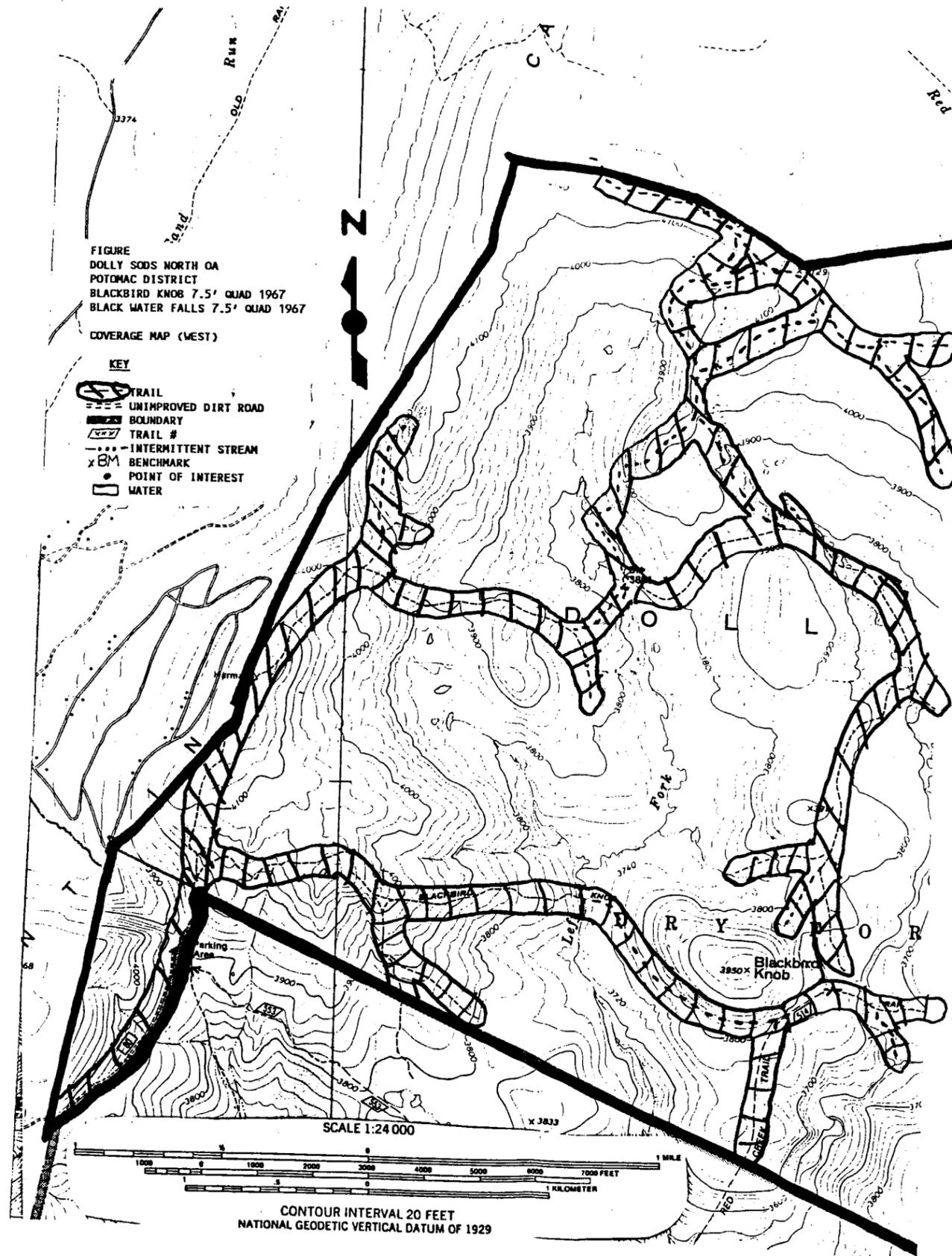


Fig. 21
p. 40

SURVEY RESULTS

Field work, which focused on trail and campsites within the Dolly Sods North Area, resulted in the addition of three previously unrecorded historic sites, one prehistoric and two historic sites. These sites are representative of the logging and prehistoric activity which took place in the region. [Figures 22-23]. It is further worth noting that the two historic sites were found along abandoned railroad grades which have been converted into many of the Dolly Sods North trails. Although important to the interpretive analysis of the Dolly Sods North area, it is felt that of these three newly discovered sites only one, Caliente (46TU161), meets the criteria for listing on the National Register of Historic Places.

Due to the potential hazard of an accidental detonation of a round of unexploded ordnance, no shovel probing was permitted while in the field personnel's zone of influence which was established as a forty foot corridor of visual inspection along the trails of the Dolly Sods North Area. Despite the inability to shovel probe, the field survey did locate one previously undiscovered prehistoric site just outside the survey area. This find, when combined with the knowledge of one previously known prehistoric site and other prehistoric sites found in the vicinity as outlined in the prehistoric background, illustrates the potential for additional prehistoric finds within other high probability areas of the Dolly Sods North region.

Also present in sufficient numbers were several isolated finds. The isolated finds discovered in the Dolly Sods North Scenic Area, as documented on the enclosed Isolated Find maps [Figures 24-25], encompassed a large number of materials associated with the military training history of the region. The artifacts that were discovered were largely associated with the military maneuvers that took place in the mid-1940s. These artifacts consisted of thick, twisted pieces of heavy iron from mortars, and artillery shells. Each of these items was cataloged because of their uniqueness and association with the recent history of the Dolly Sods North Area. These artifacts might become important in the future as an interpretive tool for heritage tourism along the hiking trail as the Army will be destroying all pieces of exploded ordnance fragments found during their sweep of the area.

Besides the number of exploded shell fragments found along the trails, the 1996 field crew discovered one piece of unexploded ordnance imbedded in a heavily traveled main trail of the North Scenic Area on July 2, 1996 [Figure 26-27]. The round, which was later determined to be an 81-mm trench mortar, was found in the middle of the trail during a dry period in the unusually wet summer weather with all but six-inches buried in rocky ground of what was once balast of a railroad grade. The field crew took actions to notify appropriate authorities at the Potomac District Ranger Station in Petersburg, West Virginia, to begin the process of demolition of the potentially dangerous situation. After directing a volunteer wilderness ranger to the site of the unexploded ordnance the following day, the 1996 crew noted that the mortar was submerged in a puddle of water following rains the previous evening. It was determined that the mortar shell had been submerged in what is normally a wet section of the trail for

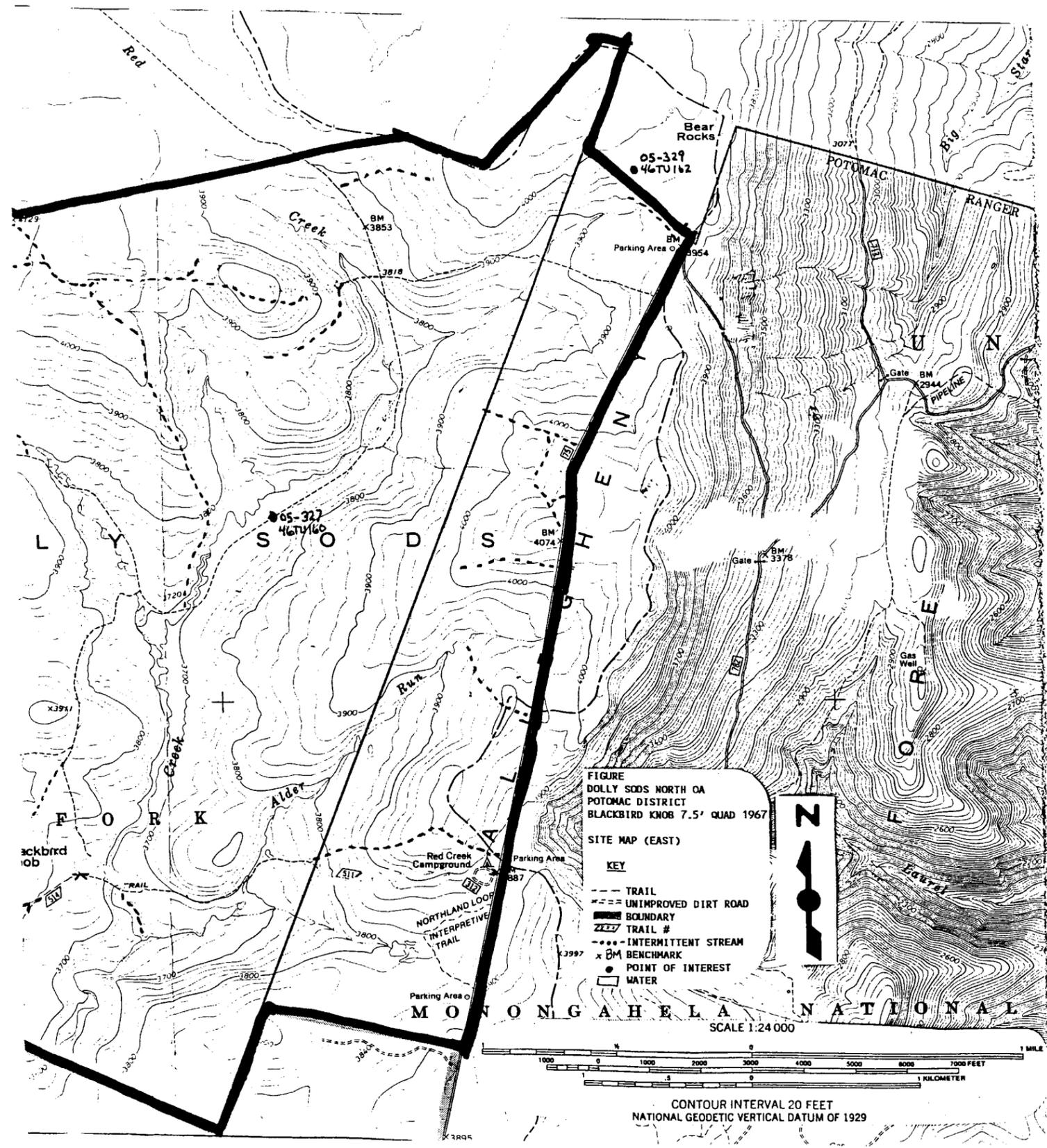


Fig. 22
 p. 42

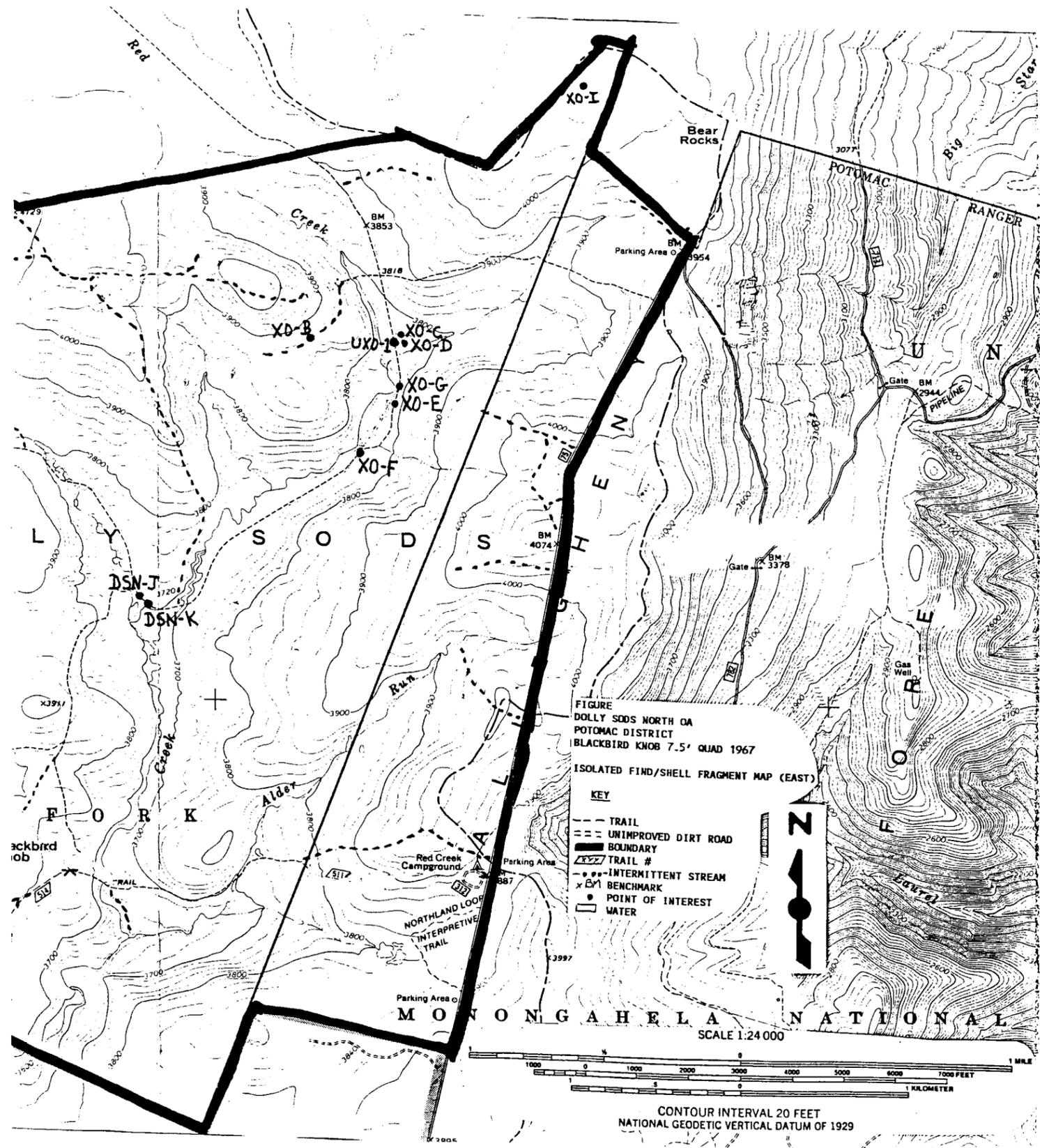


Fig. 24
p. 44



Figure 26: Dolly Sods North, UXO CR Survey 1996
UXO-1 81mm trench mortar embedded in railroad grade
with north toward bottom of the photo. Photo 7/2/96.

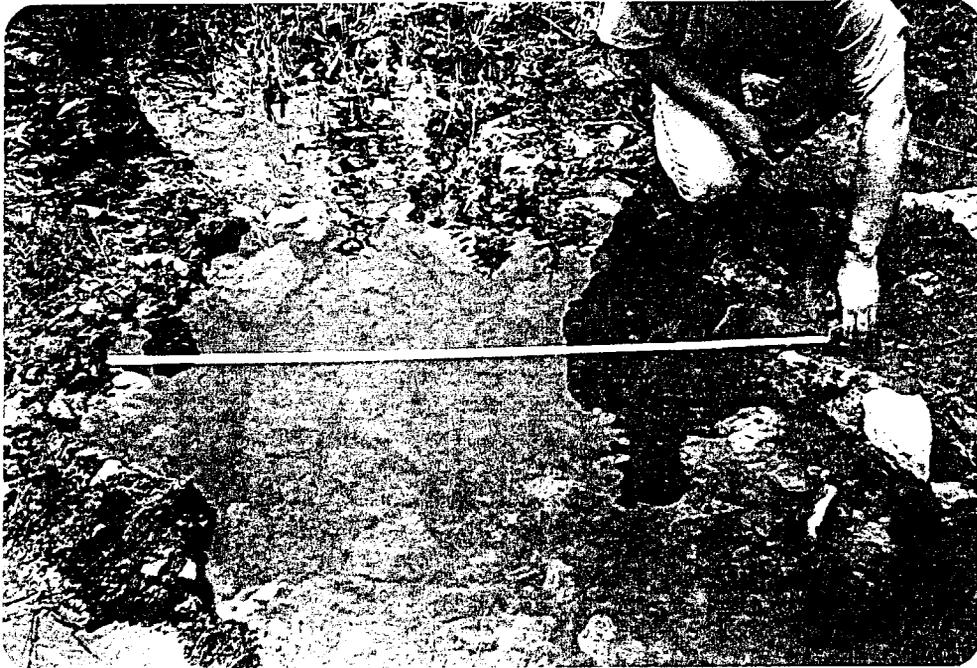


Figure 27: Dolly Sods North, UXO CR Survey 1996
UXO-1 hole after EOD July 5, 1996 detonation.
Photo taken 7/8/96, looking west, hole 4'x4', 1' deep.

over fifty years without disturbance from hikers. On Friday, July 5, 1996, an EOD unit was sent to dispose of the "live" round and after efforts to minimize the environmental impact, the unit successfully detonated the mortar shell that same day. The hole left in the wake of the explosion measured four feet wide and one foot deep.

In addition to the shell fragments, two additional isolated finds were discovered near Red Creek in the Dolly Sods North Scenic Area. The artifacts identified but not retrieved included one large metal nut (approximately one-inch long) and an iron railroad spike. Each artifact is representative of the logging history and, as with the isolated finds and historic sites found in the Dolly Sods Wilderness, were found along the railroad grade. Although there were fewer isolated finds and sites located in the Dolly Sods North Area than were found in the Wilderness, it does not diminish the historic importance or reflect on the amount of logging activity that occurred in the region.

The minimal number of artifacts located is directly resultant to the field conditions encountered during the course of the trail survey. Environmental factors included heavy rains which resulted in the flooding of much of the trails. This was especially true with the main trail along upper Red Creek which was extremely marshy and had several bogs and beaver dams along its course. The tall grasses and thick brush and rocky terrain made visual inspection virtually impossible in many sections.

DOLLY SODS NORTH SITE DESCRIPTIONS

Site 05-327/ 46TU160 Pasadena (Historic)

A site of a logging camp located along a logging railroad grade near Red Creek. Among the items found were glass shards, ceramic pieces, metal stove parts, and an axe head. The site is wet with tall grasses and short trees near the stream. Most of the artifacts were located in the middle of the railroad grade. This site is not eligible for the National Register of Historic Places.

Site 05-328/ 46TU161 Caliente (Historic)

Located along a railroad grade near Left Fork, the site includes an old logging camp. The site includes two bed frames, several pieces of broken glass, metal wire, and miscellaneous metal pieces. Nearby, a large metal piece of unknown use was found. Vegetation on the site includes apple trees, huckleberry bushes, and low grasses. This site is potentially eligible for listing on the National Register of Historic Places.

Site 05-329/ 46GT162 Close But No Cigar (Prehistoric)

This site is not located within the National Forest, however it lies 50 feet outside the line on Virginia Power and Electric Co. land. The site contains lithic scatter consisting of five pieces of chert within a stony wash. The area is found at a high elevation (4,120ft.) and is in an open alpine meadow above a marsh. This site out of the project area and should be avoided, however, the site is not eligible for the National Register of Historic Places.

Site 05-171/ 46TU41 Bear Rocks (Prehistoric)

The site is located approximately 1/2 miles southwest of Bear Rocks in the Dolly Sods North Scenic Area and a 1,500 feet west of Forest Service Road 75. The site is located on a low, flat bench overlooking the headwaters of the right fork of Red Creek along an old Jeep road/trail leading westward from Forest Service Road 75. The site overlooks a wetland bog and contains small chert debitage. During an earlier survey of the area in 1986, one projectile point was retrieved from the site and cataloged. The site was remonitored in 1996 and no additional projectile points were found, however, numerous chert flakes were observed in the jeep trail. This site is not considered eligible for listing on the National Register of Historic Places.

CULTURAL RESOURCES NOTED BUT NOT FORMALLY RECORDED

<u>FIELD #</u>	<u>DESCRIPTION</u>	<u>WHY NOT RECORDED?</u>
UXO-1	unexploded ordnance	isolated find
XO-A	exploded ordnance	isolated find
XO-B	" "	" "
XO-C	" "	" "
XO-D	" "	" "
XO-E	" "	" "
XO-F	" "	" "
XO-G	" "	" "
XO-H	" "	" "
XO-I	" "	" "
DSN-J	railroad spike	isolated find
DSN-K	metal nut	isolated find

SURVEY CONCLUSION

During the course of trail surveys in the Dolly Sods North Scenic Area the field crew documented a total of four sites, of which three were new and one was previously recorded. The new sites included one prehistoric site, Close But No Cigar (FS 09-21-05-329, 46TU162), and two historic sites, Caliente (FS 09-21-05-328, 46TU161), and Pasadena (FS 09-21-05-327, 46TU160). The previously recorded site, Bear Rocks (FS 09-21-05-171, 46TU41), is a prehistoric site. With the exception of Close But No Cigar, all sites were located within the boundary of the Dolly Sods North Area.

Field reconnaissance of the historic sites revealed a large concentration of artifacts dating from the turn of the twentieth century in association with the logging and railroad history of the region. The artifacts found on each of these sites included glass bottle fragments, ironstone and ceramic dish shards, iron spikes, axe head, stove parts, bed frame, barrel hoops, cross-ties and horseshoes. When combined with the miles of abandoned railroad grade and the documentation available in books, such as Roy Clarkson's (1964) *Tumult on the Mountain*, the artifacts clearly point to an association with the logging history of the area. Research of available records and photographs revealed the Dolly Sods North Area was the scene of extensive logging activity shortly following the turn of the twentieth century. Much of the logging that transpired in both the Dolly Sods Wilderness and northern Scenic Area was attributed to the Parsons Pulp and Lumber Company and their subsidiary lumber companies. The timber harvested by the lumberjacks was sent to a staging area such as a log landing or near a lumber camp and transported to the band mill at Laneville using Shay locomotives.

Unlike the Dolly Sods Wilderness, the North Area does not contain any homestead sites. Recently, however, hunters have constructed several unique temporary structures [Figures 28-29]. A total of five of these cabins and shelters are located in the Dolly Sods North Area. The dwellings range from a well stocked and furnished plywood cabin ("C") near Red Creek to a burnt out shell of two metal trailers surrounded by piles of discarded soft drink cans ("B") [Figures 30-39]. The majority of cabins found appear to have been abandoned since the Forest Service acquisition of the property.

The increased usage of the Dolly Sods North Area by hikers and berry pickers in the past several decades, coupled with the use of former railroad grades as trails, has increased the threat of disturbance and vandalism. This observation is true in the case of the Pasadena site where the former railroad grade now a trail passes through the former logging camp site. Many of the artifacts that are found at the Pasadena site are scattered in the trail and displaced.

Even though all of the sites are important for interpretive analysis of the region's history, only one of the four sites, Caliente (46TU161), was found potentially eligible for listing on the National Register of Historic Places. In the case of Pasadena, ineligibility was due to previous disturbance and the lack of uniqueness from other

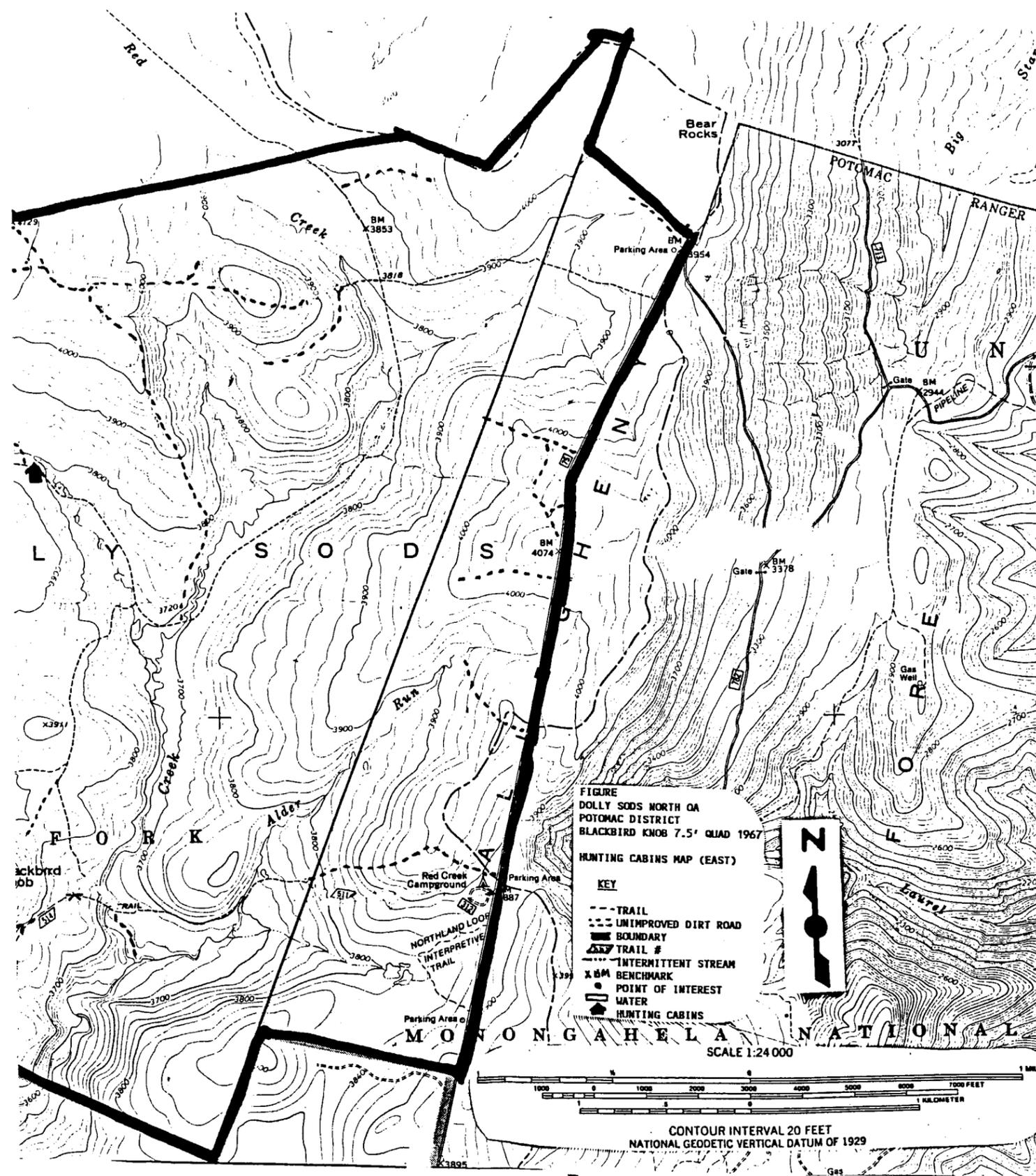


Fig. 28
 p. 51

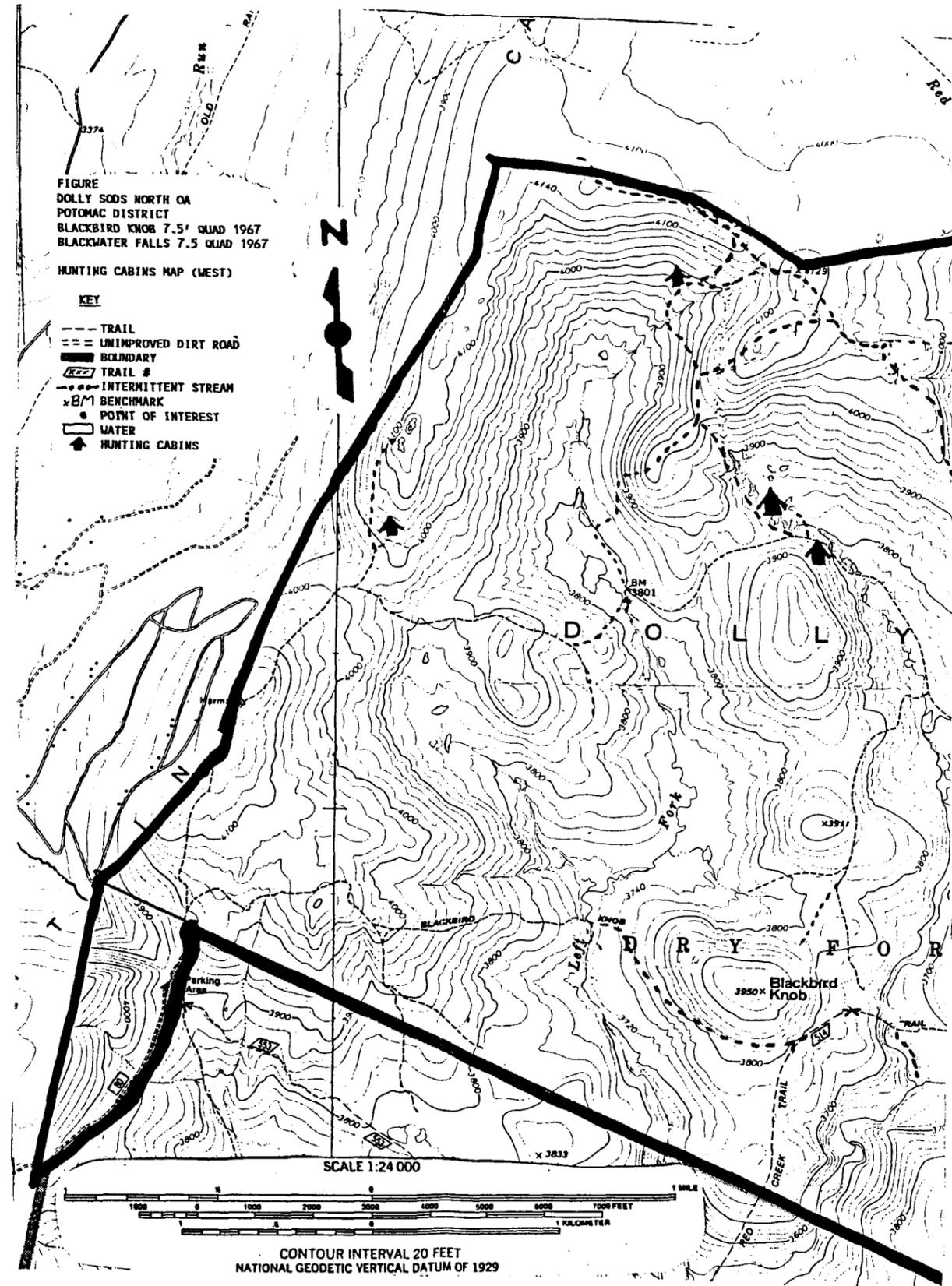


Fig. 29
 p. 52

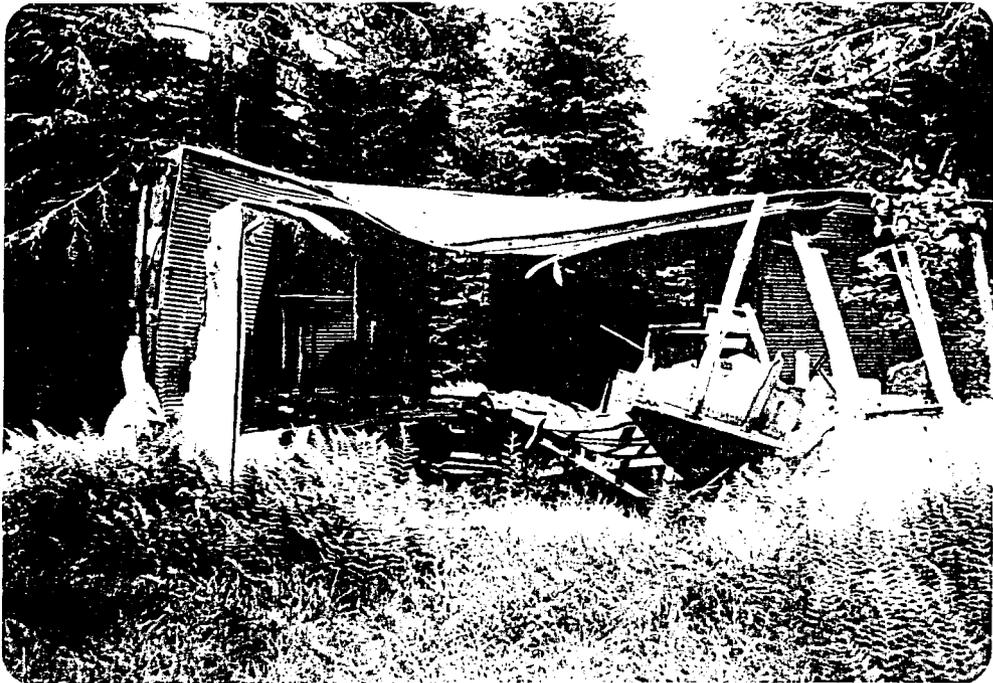


Figure 30: Dolly Sods North, UXO CR Survey 1996.
Hunting Cabin "B", Dolly Sods North.
Looking west at burnt metal trailers.

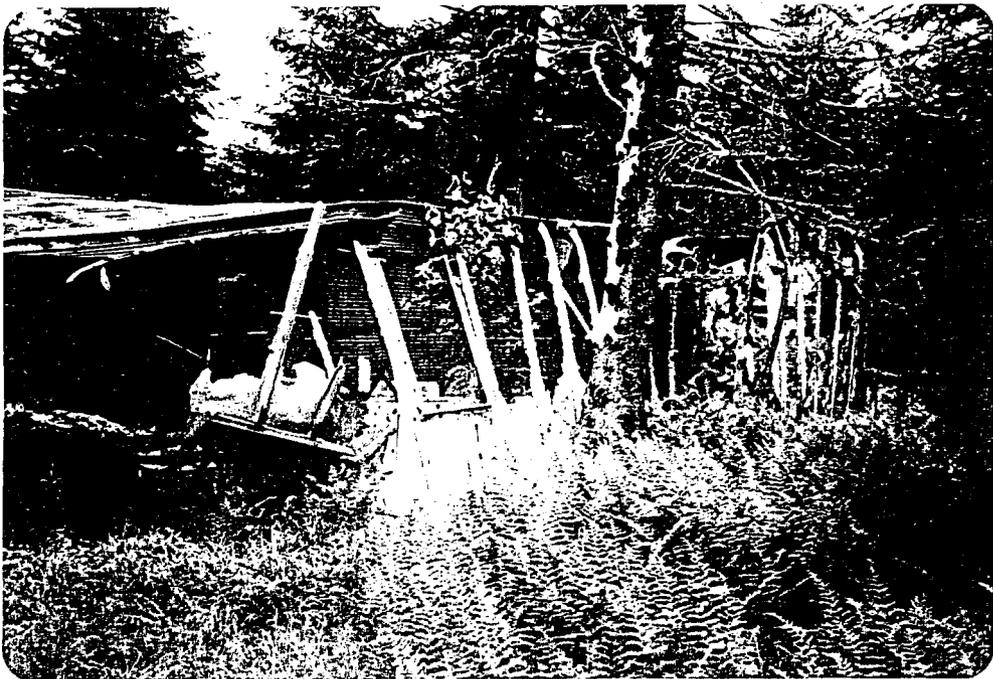


Figure 31: Dolly Sods North, UXO CR Survey 1996
Hunting cabin "B", Dolly Sods North.
Looking west at burnt metal trailers.



Figure 32: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "B", Dolly Sods North.
Debris surrounding trailer area.



Figure 33: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "B", Dolly Sods North.
Debris found west of trailer.

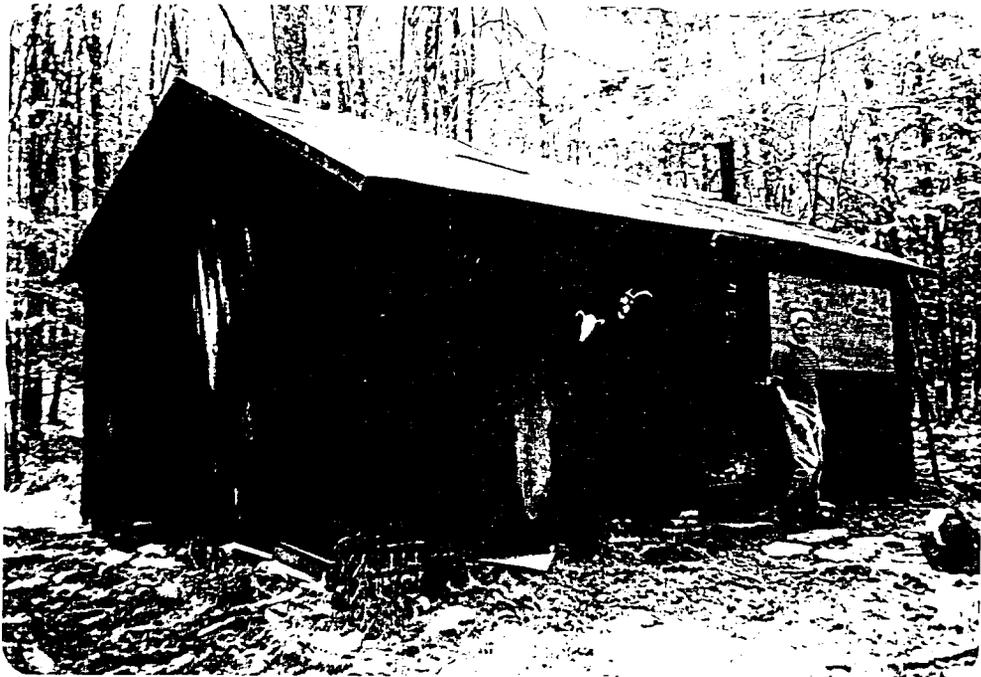


Figure 34: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "C", Dolly Sods North.
Looking northwest at southeast corner.

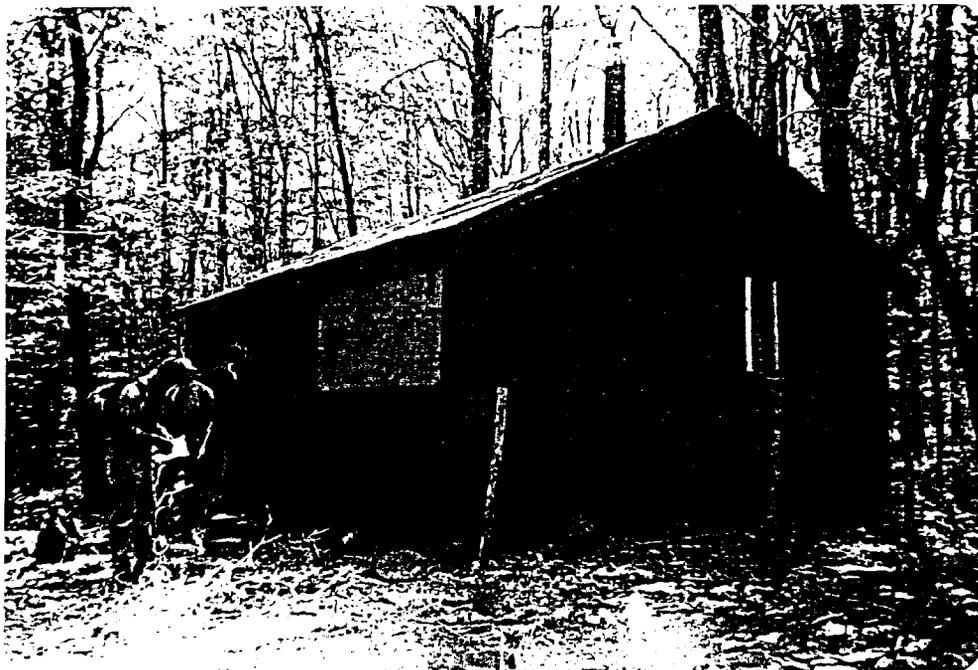


Figure 35: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "C", Dolly Sods North.
Looking southwest at northeast corner.



Figure 36: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "C", Dolly Sods North.
Interior view of cabin.

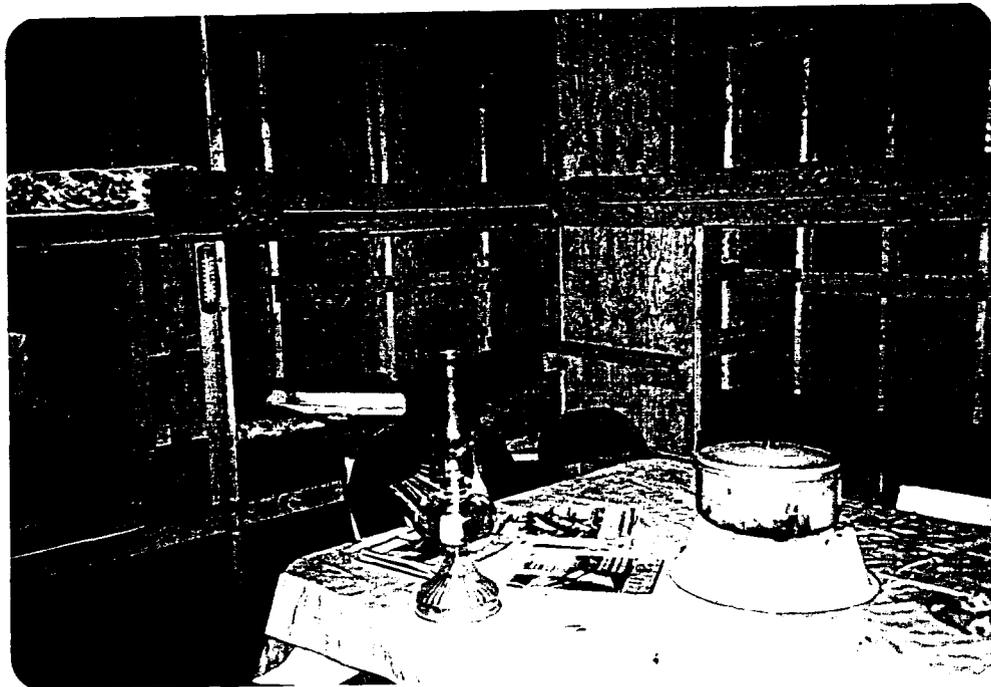


Figure 37: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "C", Dolly Sods North.
Interior view of cabin.



Figure 38: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "D", Dolly Sods North.
Looking north at southeast corner along trail.



Figure 39: Dolly Sods North, UXO CR Survey 1996
Hunting Cabin "D", Dolly Sods North.
Looking south at cabin and debris along trail.

logging sites found elsewhere on the Monongahela National Forest. A similar verdict was rendered with Close But No Cigar and Bear Rocks, the only two prehistoric sites noted during the course of the survey. Due to the finds being limited to lithic scatter of chert fragments and confined to a small wash, the prehistoric site was not deemed eligible for inclusion on the National Register of Historic Places. It is also important to note that this site is located just north of the Dolly Sods North Scenic Area boundary on the property of the Virginia Power and Electric Company.

Caliente was identified as being potentially eligible for the National Register of Historic Places under Criteria D. The identified site will not be subject to Phase II investigation because this process was not part of the implemented plan for the project. Caliente has been highlighted due to its surface artifacts and the potential for more significant sub-surface artifacts that may yield important information about West Virginia's logging history.

It is understood that three of the four sites will most likely be impacted during the course of the unexploded ordnance removal project being conducted by the Army Corps of Engineers due to their inclusion in the forty-foot corridor along the surveyed trails. Following consultation with the Forest Service, Army Corps of Engineers, and the State Historic Preservation Office, the demolition contractors have agreed to replace artifacts found during their excavations for unexploded ordnance at sites, like Caliente, which are deemed potentially eligible for the National Register.

With the exception of Close But No Cigar and Bear Rocks, no additional prehistoric material was found along the forty-foot corridor of the trail during the visual survey of the area. However, it must be stressed that shovel probing of potentially high probability areas as outlined in the forest overview was not permitted due to the inherent risk of unexploded ordnance in the area. The fact that no prehistoric artifacts were visibly present does not eliminate the prospect that such material could be found in the sub-surface level. This is based largely upon the amounts of prehistoric activity and noted sites found along the boundary of the Dolly Sods survey area. The visual search was also hampered by poor visibility due to rain, fog, and low, thick vegetation. We conclude that there is a probability that prehistoric material could exist within the boundaries of the Dolly Sods area.

The discovery of numerous exploded ordnance fragments and one round of unexploded ordnance points to a high probability that several more live rounds could be buried deep below the surface. There is also a high probability that many rounds could be impossible to locate due to the thick carpet of low brush and grasses or be buried in the bog and wetland areas of the upper Red Creek drainage. In the case of the unexploded ordnance found in the 1996 field work, the mortar shell was found in the middle of the trail only during a dry period in the weather. The next day, after a night's rainfall, the shell was almost missed because the depression which it rested in was filled with water. The flagging used to mark the site the previous day was the

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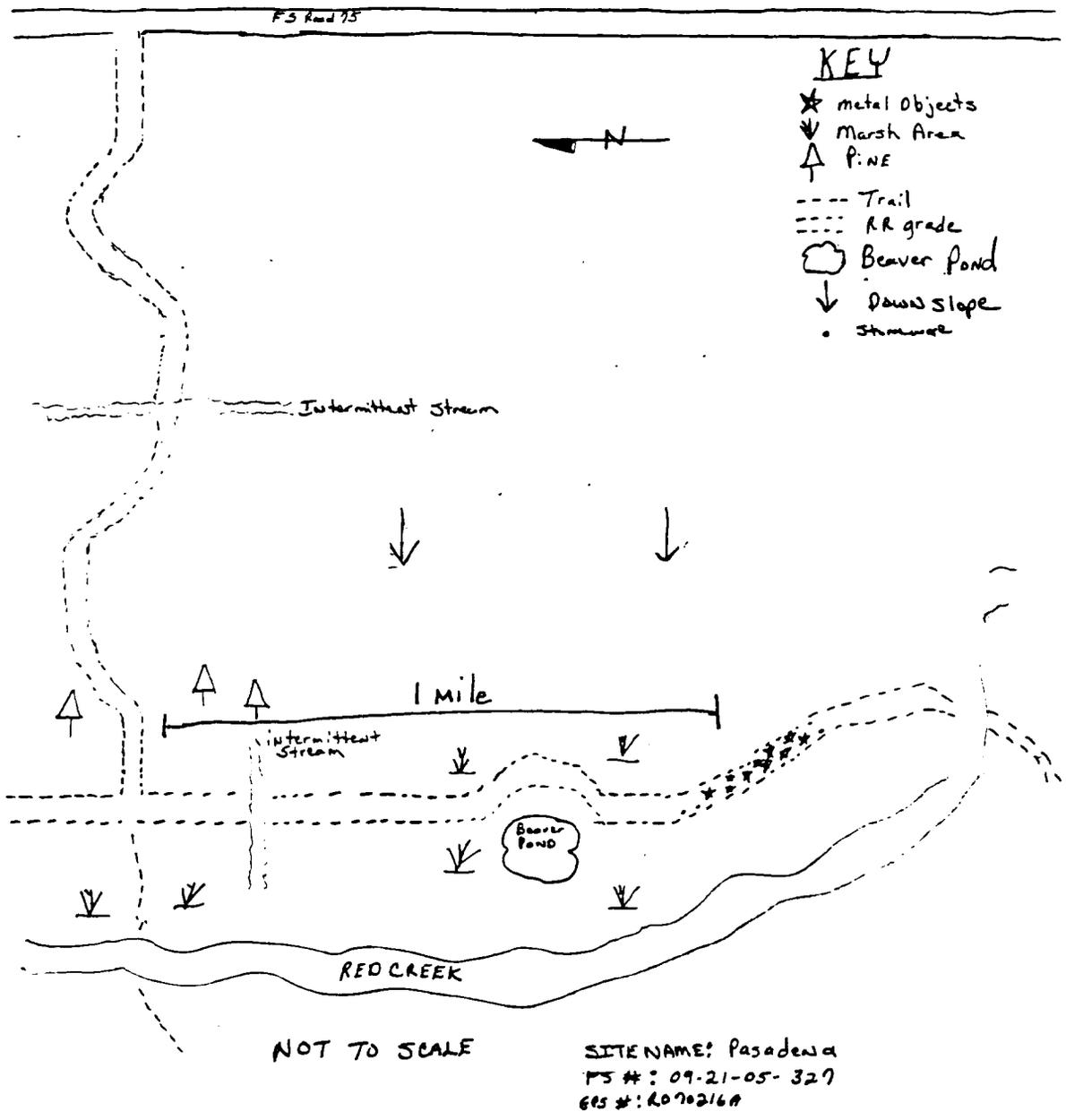
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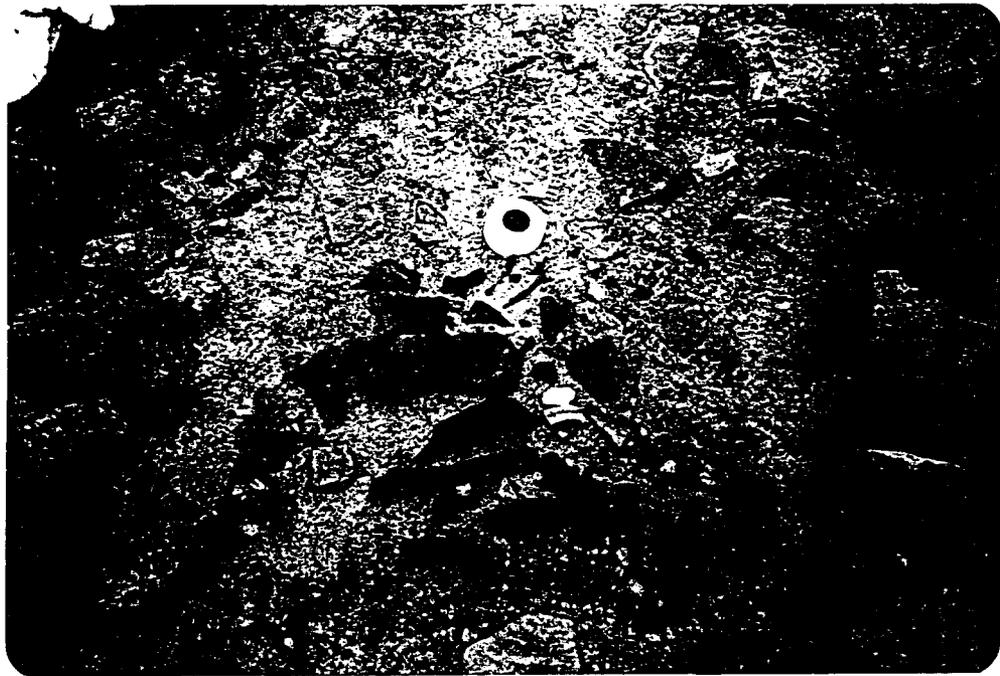
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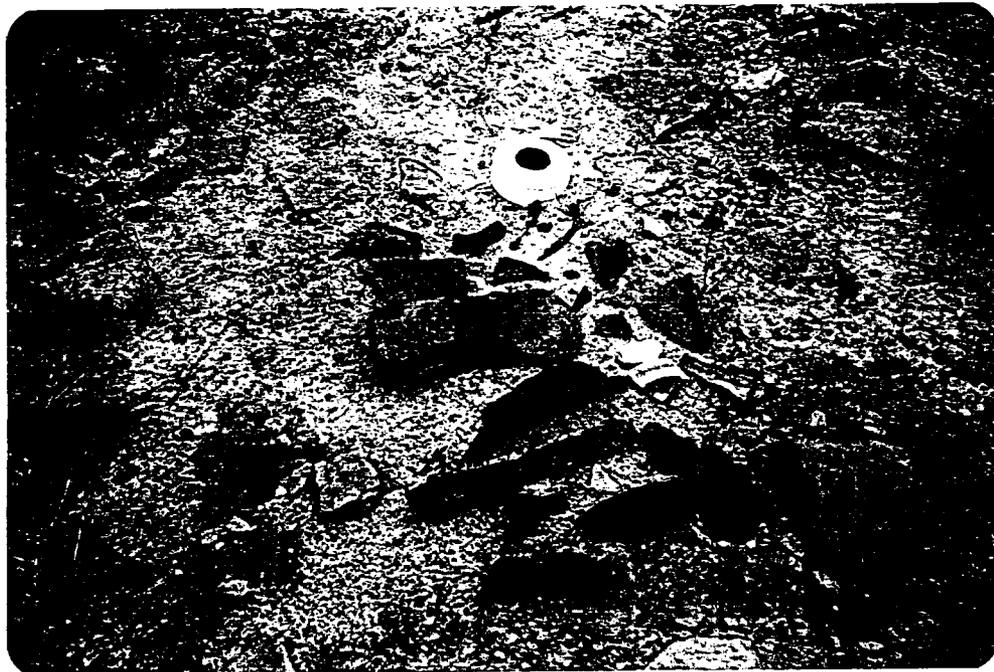
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Velocity Units : Miles/Hour





Dolly Sods North, UXO CR Survey 1996
Pasadena, FS Site # 09-21-05-327, 46TU160
Artifacts, looking South.



Dolly Sods North, UXO CR Survey 1996
Pasadena, FS Site # 09-21-05-327, 46TU160
Artifacts, looking South.

USDA FOREST SERVICE
 REGION 9 CULTURAL RESOURCE INVENTORY FORM
 (FSM 2361.7(2))

HISTORIC PREHISTORIC

<p>1 FS SITE NO: 09-21-05-328 RIM: SITE NAME: Caliente TYPE OF SITE: Historic Logging DATE OR CULTURAL PERIOD: Early 1900's</p>	<p>2 STATE: WV COUNTY: Tucker STATE SITE: 46TU161 MAP REF: Blackbird Knob, USGS (7.5') SEC. _____ T____, R____/TRACT: UTM: ZONE: 17 E: 642140 N:4323720</p>
<p>3 LOCATION DESCRIPTION: 1 1/2 miles north of Blackbird Knob, SE of benchmark at 3,801 in the Dolly Sods Scenic Area. The site is along Left Fork near an abandoned railroad grade currently used as a trail.</p>	
<p>4 SITE DESCRIPTION: A historic logging campsite along a former rr. grade. The site is bounded on the south by several apple trees and the railroad grade to the north. Objects observed on the site included several metal objects associated with the logging activity in the area.</p>	
<p>5 OWNERSHIP: <input checked="" type="checkbox"/> FS <input type="checkbox"/> OTHER:</p>	<p>14 TOPOGRAPHY: Stream Valley</p>
<p>6 INVESTIGATIONS AT SITE: TYPE YEAR BY SURVEY/RECON. 1996 N. Summer Crew TESTING EXCAVATION</p>	<p>LANDFORM/ELT: PHm TYPE OF SOIL: Undifluvents NEAREST WATER: Left Fork DISTANCE, BEARING: 150' W</p>
<p>7 REPORTS, REFERENCES: -USGS Map Blackbird Knob (7.5') Quad, 1967 -Dolly Sods North CR Survey CRR# 09-21-05-159</p>	<p>VEGETATION IN VICINITY: Low shrubs, apple trees, red spruce VEGETATION ON SITE: Apple trees, low grasses ELEVATION: 3,800 SLOPE:0% ASPECT: --</p>
<p>8 LOCATION OF COLLECTIONS: N/A</p>	<p>15 CONDITION OF SITE: ARCHAEOLOG: <input checked="" type="checkbox"/> UNDISTURBED <input type="checkbox"/> DISTURBED STRUCTURAL: <input type="checkbox"/> SOUND <input type="checkbox"/> DETERIORATED <input type="checkbox"/> COLLAPSED/RUINS SOURCE OF DISTURBANCE:</p>
<p>9 OBSERVED/RECORDED CULTURAL DATA SURFACE FEATURES, ARTIFACTS: metal bands, bed frames, glass, metal cans and wire SUBSURFACE FEATURES, ARTIFACTS: AREA: DEPTH:</p>	<p>16 PRESENT LAND USE: FS Scenic Area 17 POTENTIAL IMPACTS: LOW MEDIUM HIGH VANDALISM X FS ACTIVITY X OTHER DETAILS: Isolated Area</p>
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<p>13 INVENTORY SOURCE: Field reconnaissance</p>	<p>19 ATTACHMENTS: <input checked="" type="checkbox"/> SITE LOCATION MAP <input checked="" type="checkbox"/> SKETCH MAP <input type="checkbox"/> PHOTOS <input type="checkbox"/> OTHER:</p>

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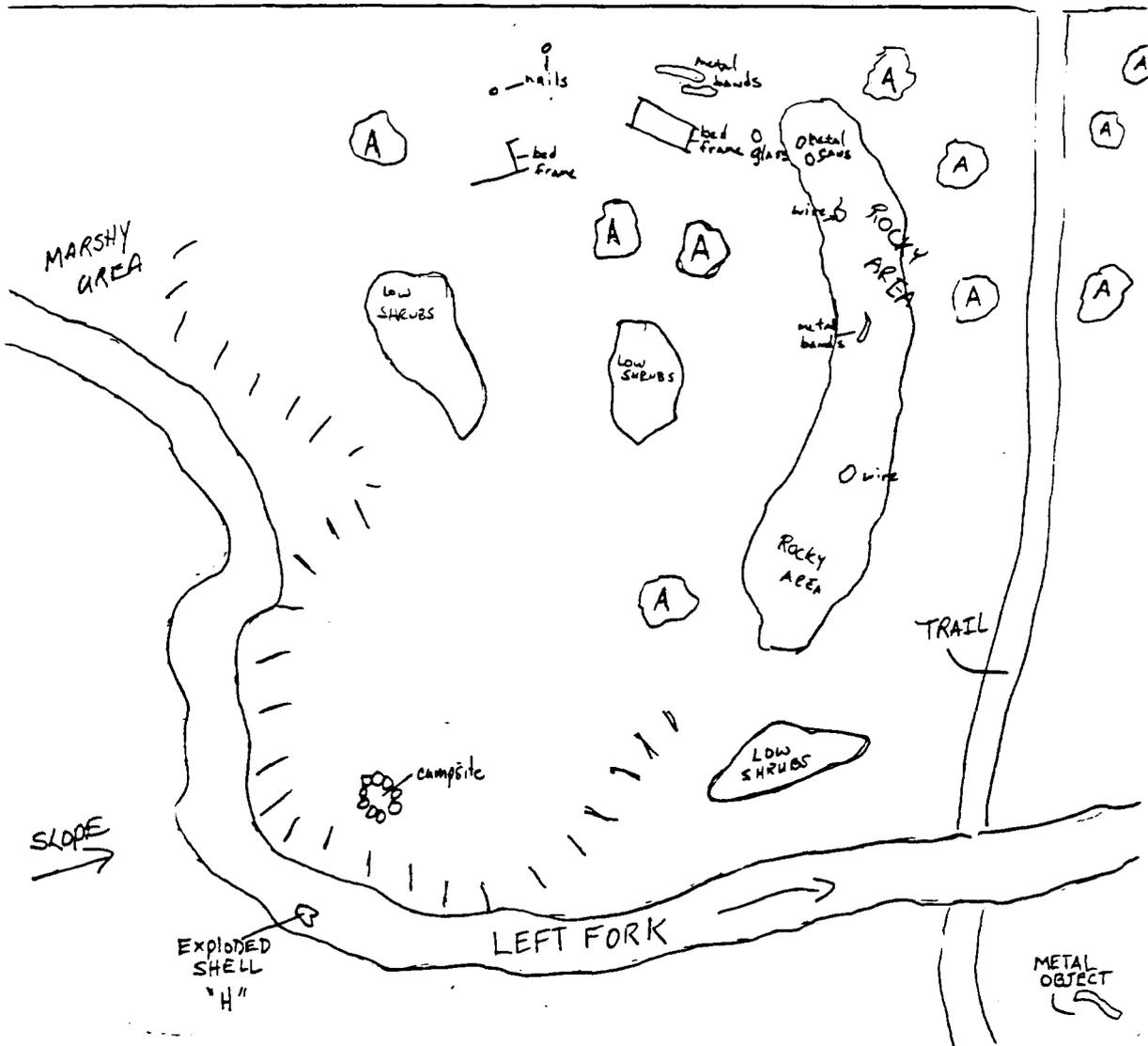
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(A) - APPLE TREE

"CALIENTE"
FS# 09-21-05-328



former R.R. Grade

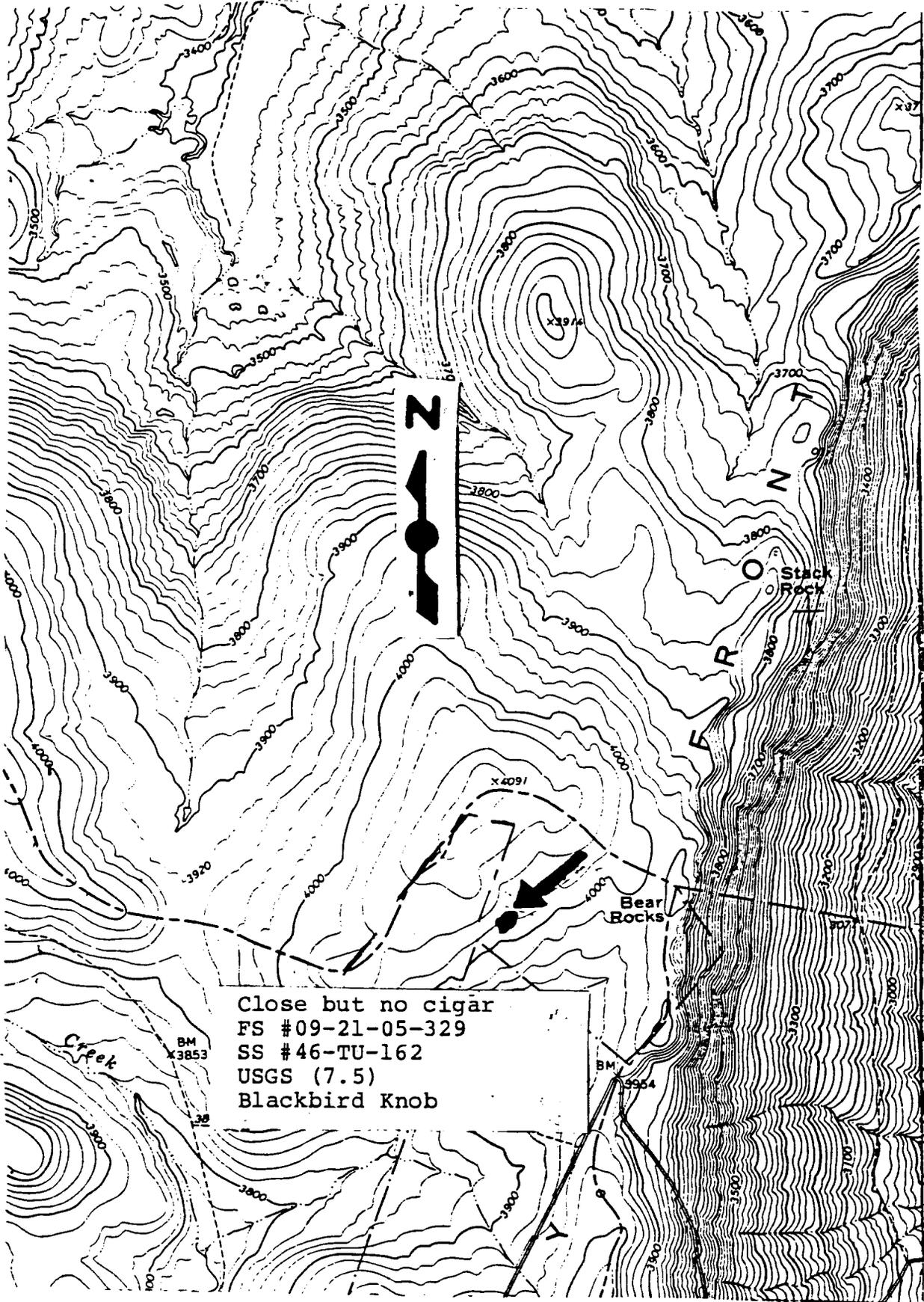




Dolly Sods North, UXO CR Survey 1996
Caliente, FS # 09-21-05-328, 46TU161.
Unidentified metal object found in sediment
filled beaver pond 200 yards southwest of main
site along upper Left Fork. Looking northeast.

USDA FOREST SERVICE REGION 9 CULTURAL RESOURCE INVENTORY FORM (FSM 2361.7(2))		___ HISTORIC <input checked="" type="checkbox"/> PREHISTORIC	F M O O R n E o S n T g a h e l a D P I o S t T o m a C c T P D L O A L N L Y U N S I O T D S N O R T H C O M P S O I O
1 FS SITE NO: 09-21-05-329 RIM: SITE NAME: Close But No Cigar TYPE OF SITE: Prehistoric lithic scatter DATE OR CULTURAL PERIOD:	2 STATE: WV COUNTY: STATE SITE NO: 46TU162 MAP REF: Blackbird Knob, 7.5' Quad SEC. ____ T____, R____/TRACT: UTM: ZONE: 17 E:646515 N:4324890		
3 LOCATION DESCRIPTION: Located on Virginia Power and Electric Co. land 1/4 mile from the Bear Rocks parking area in Dolly Sods.			
4 SITE DESCRIPTION: Chert flakes found in a stony wash above a marshy area.			
5 OWNERSHIP: ___ FS <input checked="" type="checkbox"/> OTHER: Virginia Power and Electric	14 TOPOGRAPHY: Marshy area/ rocky wash		
6 INVESTIGATIONS AT SITE: TYPE YEAR BY Recon 1996 N. Summer Crew	LANDFORM/ELT: Allegheny Highlands Plateau TYPE OF SOIL: deep, low fertility Undifluvents NEAREST WATER: Tributary of Red Creek		
7 REPORTS, REFERENCES: CRR# 09-21-05-159, Dolly Sods North UXO-CR Survey	DISTANCE, BEARING: approx. 210 ft., South VEGETATION IN VICINITY: Low grasses VEGETATION ON SITE: Low grasses, shrubs ELEVATION: 3,980 SLOPE: 30% ASPECT: SE		
8 LOCATION OF COLLECTIONS: none	15 CONDITION OF SITE: ARCHAEOLOG: <input checked="" type="checkbox"/> UNDISTURBED ___ DISTURBED STRUCTURAL: ___ SOUND ___ DETERIORATED ___ COLLAPSED/RUINS SOURCE OF DISTURBANCE:		
9 OBSERVED/RECORDED CULTURAL DATA SURFACE FEATURES, ARTIFACTS: 5 chert flakes SUBSURFACE FEATURES, ARTIFACTS: AREA: DEPTH:	16 PRESENT LAND USE: Power plant watershed 17 POTENTIAL IMPACTS: LOW MEDIUM HIGH VANDALISM <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> FS ACTIVITY <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> DETAILS: Power Company usage.		
10 CLASSIFICATION: ___ CLASS I (ELIGIBLE) ___ CLASS II (UNEVALUATED) <input checked="" type="checkbox"/> CLASS III (NOT ELIGIBLE)	18 REMARKS/RECOMMENDATIONS:		
11 ON/NONIMATED: ___ WRHP ___ NHL ___ HABS ___ HAER			
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13 INVENTORY SOURCE: Field reconnaissance	19 ATTACHMENTS: <input checked="" type="checkbox"/> SITE LOCATION MAP <input checked="" type="checkbox"/> SKETCH MAP ___ PHOTOS ___ OTHER:		

R9-2300-8 (2/79)



Close but no cigar
FS #09-21-05-329
SS #46-TU-162
USGS (7.5)
Blackbird Knob

SITE MAP

"CLOSE BUT NO CIGAR"

NOT TO SCALE

MNF LAND

ALLEGHENY POWER CO.
LAND

NATIONAL FOREST BOUNDARY
VIRGINIA POWER AND ELECTRIC CO.

7x10' shallow wash
Chert
Flakes



SLOPE

MONONGAHELA
NATIONAL FOREST
LAND

VIRGINIA POWER AND ELECTRIC CO. - LAND
NATIONAL FOREST BOUNDARY

WET AREA

TRAIL

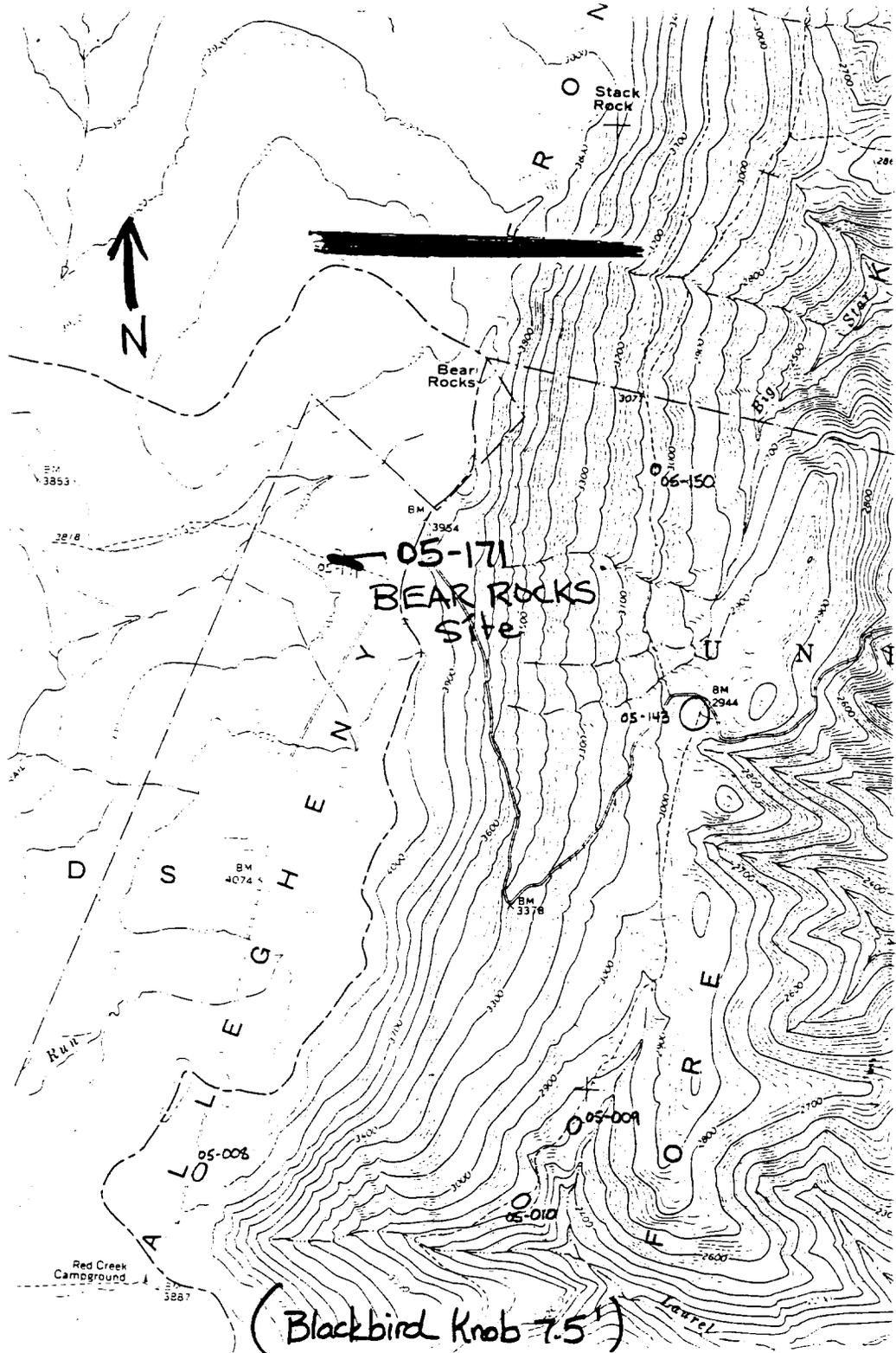
Bear
Rock

FR 75



USDA FOREST SERVICE REGION 9 CULTURAL RESOURCE INVENTORY FORM (FSM 2361.7(2))		<input type="checkbox"/> HISTORIC	<input checked="" type="checkbox"/> PREHISTORIC																
1 FS SITE NO: 09-21-05-171 RIM: SITE NAME: Bear Rocks TYPE OF SITE: Prehistoric DATE OR CULTURAL PERIOD: Unknown	2 STATE: WV COUNTY: Tucker STATE SITE NO: 467441 MAP REF: Blackbird Knob 7.5' SEC. _____ T _____, R _____ /TRACT: UTM: ZONE: E: N:																		
3 LOCATION DESCRIPTION: The site is located 1/2 mile southwest of Bear Rocks on Dolly Sods and approximately 1,500 feet west of Forest Route 75.																			
4 SITE DESCRIPTION: The site is located on a low, flat bench overlooking the headwaters of the right fork of Red Creek along an old jeep trail which intersects Forest Route 75 1/2 mile south of Bear Rocks. The site is on a low, dry bench overlooking two large upland bogs.																			
5 OWNERSHIP: <input checked="" type="checkbox"/> FS <input type="checkbox"/> OTHER:	14 TOPOGRAPHY: Appalachian Plateau LANDFORM/ELEMENT: Allegheny Front TYPE OF SOIL: Silty A horizon NEAREST WATER: Right fork headwaters of Red Creek DISTANCE, BEARING: 500 feet north and south VEGETATION IN VICINITY: Open grassland scattered spruce, "tundra park-like" VEGETATION ON SITE: Open grassland ELEVATION: 3920 ft. SLOPE: 0% ASPECT: SW																		
6 INVESTIGATIONS AT SITE: TYPE YEAR BY SURVEY/RECON. 1986 H. Lesser TESTING 1990 Seasonal Crew EXCAVATION	15 CONDITION OF SITE: ARCHAEOLOG: <input type="checkbox"/> UNDISTURBED <input type="checkbox"/> DISTURBED STRUCTURAL: <input type="checkbox"/> SOUND <input type="checkbox"/> DETERIORATED <input type="checkbox"/> COLLAPSED/RUINS SOURCE OF DISTURBANCE:																		
7 REPORTS, REFERENCES:	16 PRESENT LAND USE: Multiple Use																		
8 LOCATION OF COLLECTIONS: Supervisor's Office Monongahela National Forest	17 POTENTIAL IMPACTS:																		
9 OBSERVED/RECORDED CULTURAL DATA SURFACE FEATURES, ARTIFACTS: Chert debitage scattered across low spots in jeep trail, continuing toward FR 75. One small projectile point recovered. SUBSURFACE FEATURES, ARTIFACTS: AREA: DEPTH:	<table border="1"> <thead> <tr> <th></th> <th>LOW</th> <th>MEDIUM</th> <th>HIGH</th> </tr> </thead> <tbody> <tr> <td>VANDALISM</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>FS ACTIVITY</td> <td>X</td> <td></td> <td></td> </tr> <tr> <td>OTHER</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> DETAILS: Hikers/backpackers/hunters could discover and vandalize site along jeep trail				LOW	MEDIUM	HIGH	VANDALISM		X		FS ACTIVITY	X			OTHER			
	LOW	MEDIUM	HIGH																
VANDALISM		X																	
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10 CLASSIFICATION: <input type="checkbox"/> CLASS I (ELIGIBLE) <input checked="" type="checkbox"/> CLASS II (UNEVALUATED) <input type="checkbox"/> CLASS III (NOT ELIGIBLE)	18 REMARKS/RECOMMENDATIONS: Evaluate for National Register eligibility																		
11 ON/NOMINATED: <input type="checkbox"/> NRHP <input type="checkbox"/> NHL <input type="checkbox"/> HABS <input type="checkbox"/> HAER	19 ATTACHMENTS: <input checked="" type="checkbox"/> SITE LOCATION MAP <input type="checkbox"/> SKETCH MAP <input type="checkbox"/> PHOTOS <input type="checkbox"/> OTHER:																		
12 RECORDED BY: Hunter Lesser (8/6/86) REVISED BY: (/ /)																			
13 INVENTORY SOURCE:																			

FOREST Monongahela DISTRICT Potomac PLAN. UNIT COMP. 2 SITE NO. 171

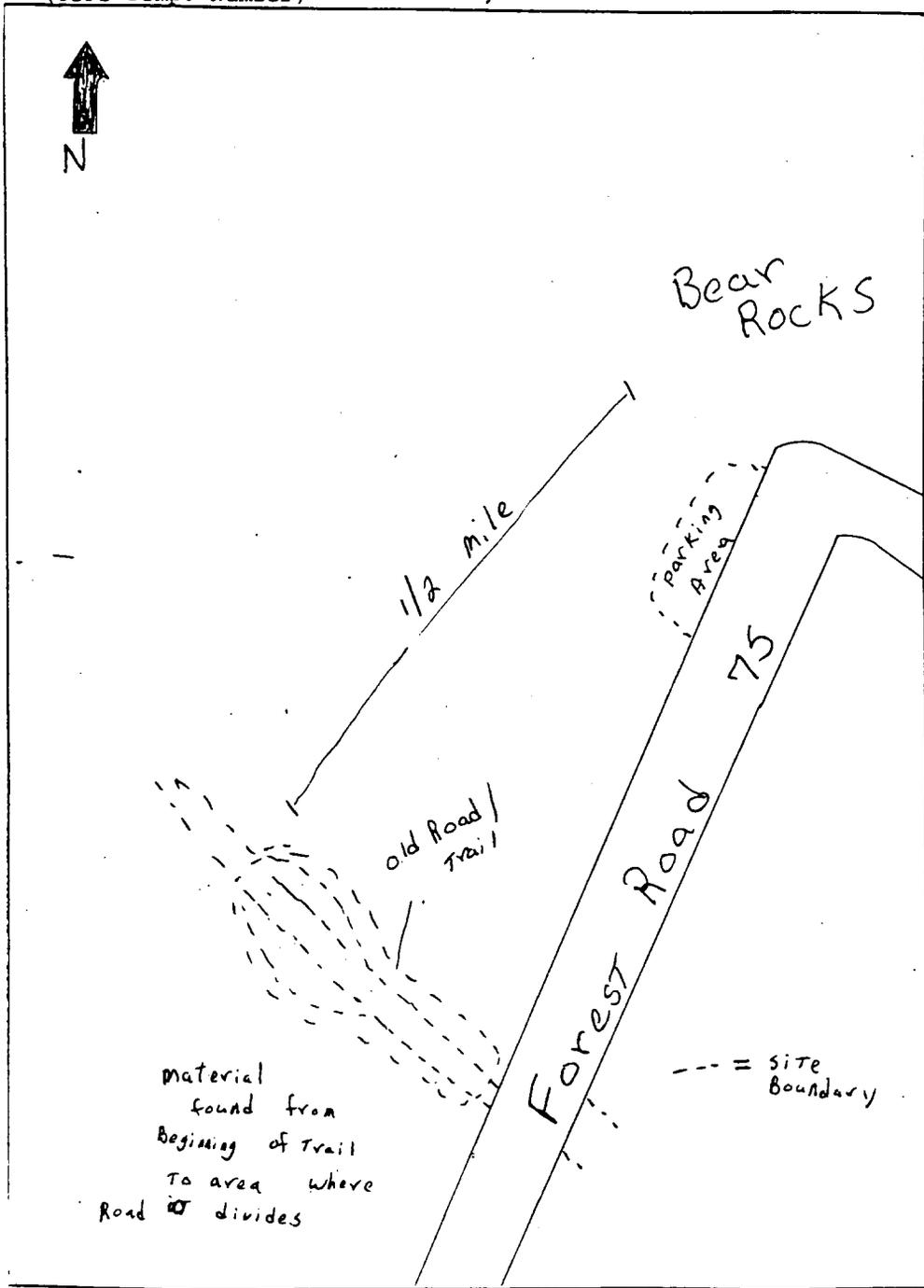


Sketch Map

09-21-05-171
RESOURCE IDENTIFIER
(USFS Temp. Number)

CONTINUATION SHEET

Bear Rocks
site



MESSAGE DISPLAY FOR ROBERT C. WHETSELL

To Crew
CC R.Brinker
CC O.Durham
CC B.Kerr

From: Robert C. Whetsell
Postmark: Jul 03,96 4:28 PM Delivered: Jul 03,96 4:28 PM
Status: Previously read
Subject: UXO discovered in North Dolly Sods Scenic Area by North Crew

Message:

During trail survey for the UXO removal project, the North Crew located a UXO embedded in the middle of an abandoned railroad grade that was being used as trail. The trail is located along upper Red Creek approximately 1.2 miles west of the Bear Rocks parking lot. The ordnance was discovered along the trail nearly 2000 feet south of the intersection of the railroad grade trail and the trail leading to Forest Service Road 75. The ordnance was found with only the last six inches of its cartridge container visible (a pipe-like object with a shotgun cartridge in the end) leading to the flat base of the mortar's casing. The mortar was later identified as a 81mm Trench Mortar which uses TNT as its high explosive filler. The mortar was found in an wet area (although dry and visible when found, after a rain it is covered by water) embedded in a 60' angle to the north. After notification of the Potomac District and the Project Director Wally Dean, a state permit has been issued for the disposal of the UXO. This will be handled on July 4, 1996 by a Army EOD unit under supervision of Forest Service observers. Upon determination of the condition of the UXO (live or practice) it will be destroyed using an electrically controlled detonator either on site or at a remote area. Efforts are being made to lessen the impact to the surrounding area.

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81-MM TRENCH MORTAR.

General. The first attempt to obtain more efficient trench mortar ammunition was with the development of the 75-mm smooth bore mortar in which the old 75-mm French type shell was modified by tapering the shell from the bourrelet back to the base, and fitting an aluminum fin in the base of the shell. The round was propelled by means of an ignition cartridge inserted in a short cartridge case, and with propelling increments inserted between the blades of the fin. The stability of the round was not satisfactory, and the development was abandoned. A streamlined projectile with fin assembly was then designed for the 3-inch trench mortar with poor results. Several attempts were made with shell of different contours, but proved unsatisfactory because proper stability was not obtained.

After World War I, there was an early trend away from the low powered, muzzle-loading Stokes mortar to breech and rifled mortars which were mounted on wheels. The muzzle velocity, the range, and the weight increased, but in so doing, the effectiveness of the trench mortar was decreased in that it lost its simplicity. The weapon became too cumbersome and unwieldy.

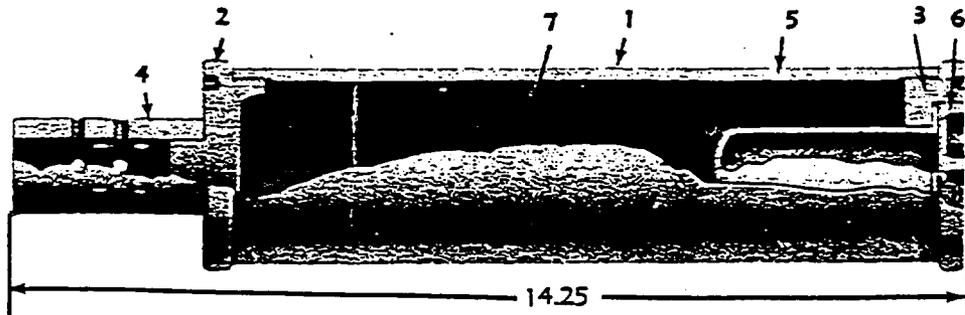
Meanwhile the Edgar Brandt Company worked on the 81-mm trench mortar which turned out to be simple in design, utilizing ammunition which was stable in flight and had a long range. In 1931 and 1932, tests conducted by the War Department proved that this mortar and ammunition were highly satisfactory. In 1932, manufacturing rights were purchased from Brandt Company. The weapon itself was a refinement of the 3-inch trench mortar, consisting mainly of a cross leveling mechanism, a better sight, and a heavier baseplate. For simplicity and effectiveness, this mortar proved a remarkable weapon.

Advantages of 81-mm over 3-inch Trench Mortar Ammunition.

1. The 81-mm ammunition is more stable in flight.
2. The 81-mm ammunition has a longer range.
3. The 81-mm ammunition comes to the firing line assembled, ready for use.
4. The 81-mm ammunition utilizes a point detonating fuze.

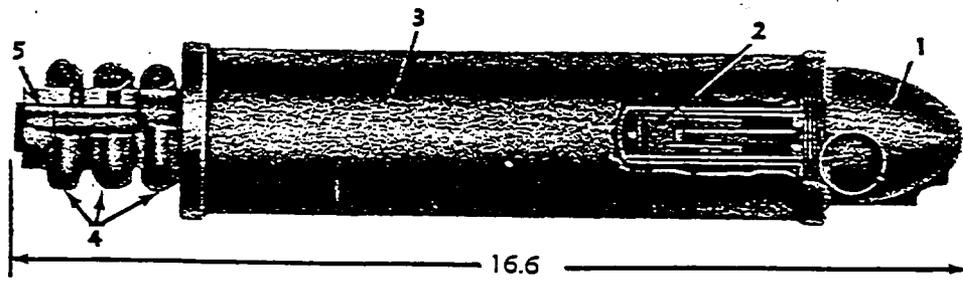
Types of 81-mm Ammunition: High-explosive shell, chemical shell, practice shell, and training shell.

Class of Ammunition. 81-mm ammunition is classified as semi-fixed; although the ammunition is designed to be loaded into the weapon in one operation, provisions are made for adjusting the propelling charge at the point of fire.



HIGH EXPLOSIVE SHELL

- | | |
|-------------------------|----------------------------|
| 1 — CASING | 5 — BOOSTER JACKET |
| 2 — BASE | 6 — FUZE HOLE PLUG |
| 3 — HEAD | 7 — EXPLOSIVE FILLER (TNT) |
| 4 — CARTRIDGE CONTAINER | |



COMPLETE ROUND

- | | |
|-------------|------------------|
| 1 — FUZE | 4 — POWDER RINGS |
| 2 — BOOSTER | 5 — CARTRIDGE |
| 3 — SHELL | |

RA PD 15199

3-inch and 81-mm Trench Mortar Ammunition Mk. I

Bob Hudecheck
Wilderness/Backcountry Volunteer, 1996

ORDNANCE REMOVAL: JULY 5, 1996

On July 5, 1996 a "live" ordnance was detonated in the Dolly Sods North Area. The location of the site was approximately 1 1/2 - 2 miles in along the "jeep road", about 300 yards south were and old railroad grade intersects the trail at a T intersection near Bear Rocks Scenic Overlook. The jeep road is located around 300 feet from the Bear Rocks parking lot and is the major trail running west into this area. Around 2:30 p.m. two Army personnel and I detonated a 4.2 inch: Hte, M329 ordnance. There was a loud boom!!, which was expected because the round was live. After making visitor contacts in the Dolly Sods Wilderness Area on July 6 & 7 I learned that the sound of the explosion was heard in the upper portions of the Red Creek drainage. Since this was the Fourth of July weekend visitors had thought that it was just a firework and were not alarmed. The resource damage was at a minimum due to the site location on a rocky well established road/old railroad grade. A crater 3 feet in diameter and about 1 foot deep was left after the demolition. I raked the debris which consisted of rock and soil back into the hole and the site is now unnoticeable. The area was also checked for the Cheat Mountain Salamander before demolition continued and none were found. Overall resource disturbance was at a minimum, area was naturalized and the only effect this operation could have to this location was the loud noise the explosion made. Since this area is also used for hunting, I do not believe this caused any problems.

Safety procedures for this operation are as follows. The minimal amount of people required to destroy the ordnance were used (2 Army personnel, 1 Forest Service Employee). Once the ordnance was located it was identified and the proper precautions and actions took place based on the knowledge of the Army personnel. Once the C-4 was secured to the ordnance and the charges set one officer went down the road the opposite direction about 300 yards to warn visitors (there were none), and the other officer and I walk up the road 400 yards to stay clear of scrap metal and to warn visitors. Before the demolition occurred we yelled "fire in the hole, fire in the hole" to send out a warning then the ordnance was destroyed.