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final wild and scenic river study

august 1983

IN
STORAGE

GAULEY RIVER

WEST VIRGINIA

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FINAL REPORT

GAULEY RIVER
WILD AND SCENIC RIVER STUDY
WEST VIRGINIA

August 1983

Prepared by:

Mid-Atlantic Regional Office
National Park Service
U.S. Department of the Interior

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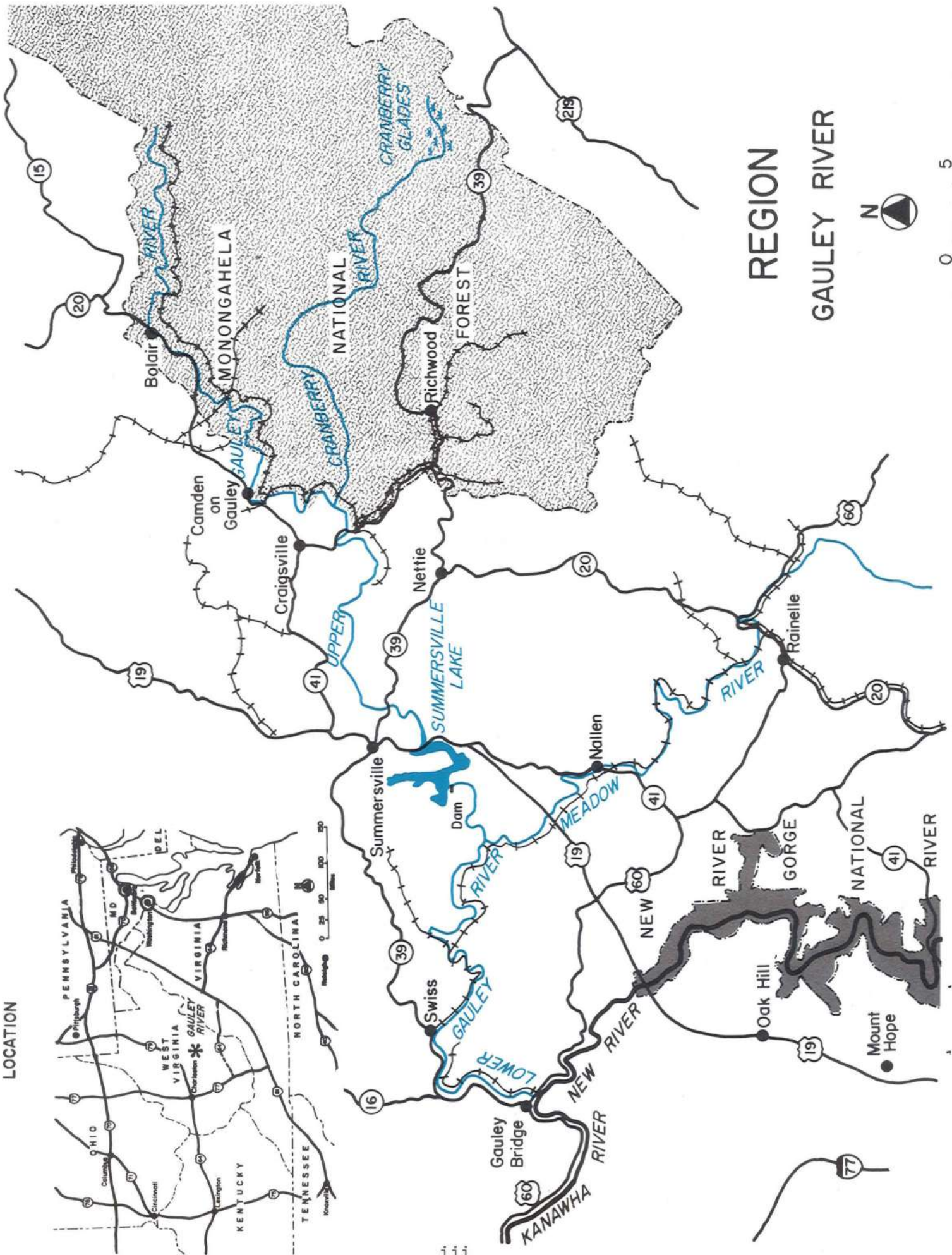
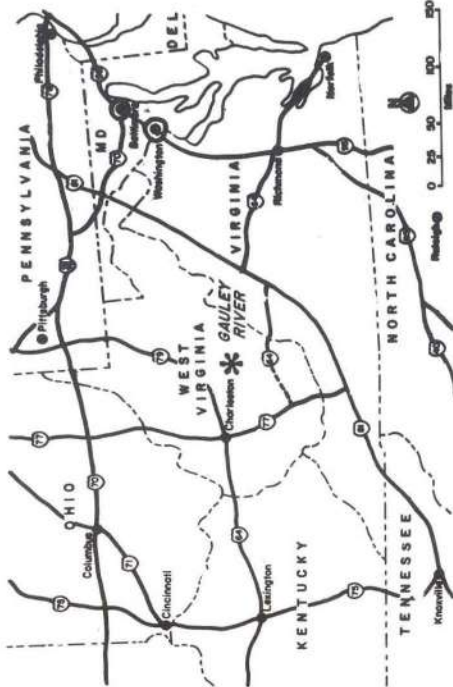
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LOCATION



REGION GAULEY RIVER



0 5
Miles

I. SUMMARY OF FINDINGS

1. THE FOLLOWING SEGMENTS OF THE GAULEY, CRANBERRY AND MEADOW RIVERS QUALIFY FOR INCLUSION IN THE NATIONAL WILD AND SCENIC RIVERS SYSTEM: THE UPPER GAULEY RIVER BETWEEN ITS JUNCTION WITH WILLIAMS RIVER AND ITS JUNCTION WITH PANTHER CREEK (24.7 MILES), THE ENTIRE CRANBERRY RIVER (33.4 MILES), THE LOWER MEADOW RIVER BETWEEN ITS JUNCTION WITH MEADOW CREEK AND ITS CONFLUENCE WITH THE GAULEY RIVER (27.8 MILES), AND THE LOWER GAULEY RIVER BETWEEN SUMMERSVILLE DAM AND SWISS (25.7 MILES).

The qualifying segments are in a free-flowing condition. The river segments and their immediate environments possess outstandingly remarkable scenic and recreational values. Their geologic and fish and wildlife values are also significant. Their water quality and flows are sufficient to sustain the outstandingly remarkable values for which they would be designated. Summersville Dam regulates the flows of a superb white water segment of the lower Gauley. The lengths of all qualifying segments are sufficient for a meaningful recreational experience.

2. THE LOWER GAULEY QUALIFYING SEGMENT (25.7 MILES), THE LOWER MEADOW BETWEEN ITS CONFLUENCE WITH THE LOWER GAULEY AND ROUTE U.S. 19 BRIDGE (4.5 MILES), AND THE UPPER CRANBERRY BETWEEN ITS SOURCE AND THE U.S. FOREST SERVICE CRANBERRY CAMPGROUND (20.4 MILES) MEET THE CRITERIA FOR CLASSIFICATION AS WILD RIVER SEGMENTS. THE UPPER GAULEY QUALIFYING SEGMENT (24.7 MILES), THE LOWER CRANBERRY FROM ITS CONFLUENCE WITH THE UPPER GAULEY AND THE U.S. FOREST SERVICE CRANBERRY CAMPGROUND (13 MILES), AND THE MEADOW RIVER BETWEEN ROUTE U.S. 19 BRIDGE AND ITS CONFLUENCE WITH MEADOW CREEK (23.3 MILES) MEET THE CRITERIA FOR CLASSIFICATION AS SCENIC RIVER SEGMENTS. (SEE CLASSIFICATION MAP ON PAGE 13).

All qualified segments are free of impoundments. Water quality generally meets the minimum criteria for body contact recreation and is able to support the range of plant and animal life which occurs naturally in this area. The wild river segments are generally inaccessible by road and the shorelines are essentially primitive and free of structures. The scenic river segments are accessible in places by road, but their shorelines are still largely primitive and largely undeveloped.

3. ALTHOUGH GAULEY AND MEADOW RIVER SEGMENTS TOTALLING 79 MILES ARE ELIGIBLE FOR INCLUSION IN THE NATIONAL WILD AND SCENIC RIVERS SYSTEM, PUBLIC INTEREST AND SUPPORT ARE NOT SUFFICIENT TO CONSIDER THEM SUITABLE FOR INCLUSION IN THE NATIONAL SYSTEM WITH FEDERAL ADMINISTRATION AT THIS TIME. THE CRANBERRY RIVER TOTALING 33 MILES IS BOTH ELIGIBLE AND SUITABLE FOR INCLUSION IN THE NATIONAL SYSTEM WITH FEDERAL ADMINISTRATION.

Following a determination of eligibility, a determination of suitability for river segments and their immediate environments is made taking into consideration such factors as the significance of the resource values present, threats to those values, and extent of public lands in the river areas; costs required for acquisition, development, management and operation; public, local or State interest in acting to protect and manage the rivers; and the feasibility and timeliness of such action.

The extensive National Forest System lands along the Cranberry River make this segment suitable for inclusion as a federally administered component of the National System. However, protection under present Forest Service management and its status as a component of the West Virginia Natural Streams Preservation System are regarded by the Forest Service as sufficient at this time to protect it. The Forest Service expects to continue current management practices for the existing Cranberry Backcountry, Cranberry Glades Botanical Areas, and Cranberry Wilderness.

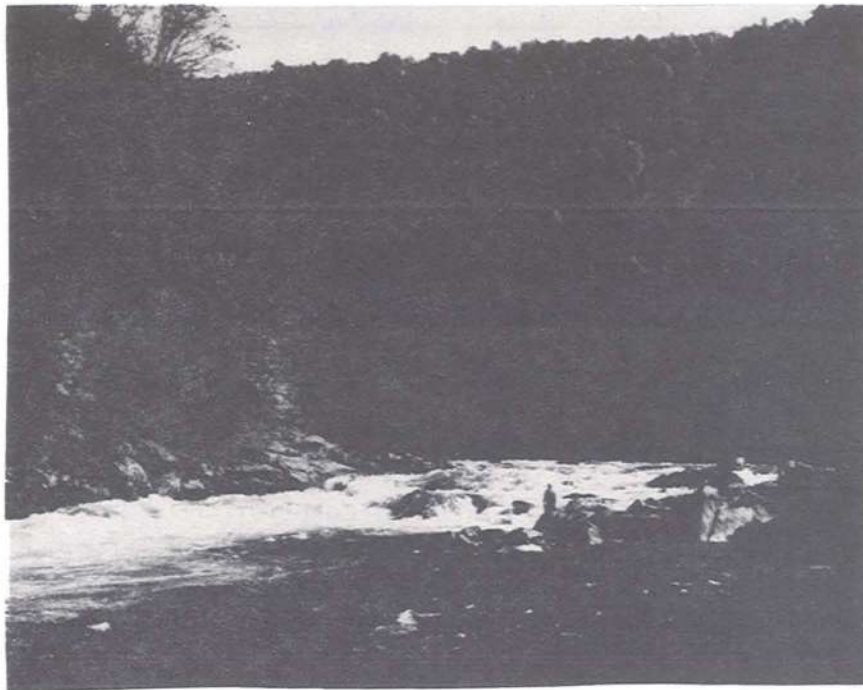
The scattered National Forest System lands along the upper Gauley are insufficient to control the river corridor without implementation of effective land use controls by State and local governments. Because this support has not materialized, this segment has been determined unsuitable for inclusion in the National System at this time.

The lower Meadow and lower Gauley are considered unsuitable for inclusion in the National System with Federal administration due to an absence of Federal land in the river corridors and for the same lack of interest by the State and local governments in land use controls as on the upper Gauley.

4. IF SUFFICIENT INTEREST AND SUPPORT DEVELOPS, THE STATE, WITH LOCAL GOVERNMENT COOPERATION, COULD APPLY FOR INCLUSION OF THESE RIVERS IN THE NATIONAL SYSTEM UNDER SECTION 2(a)(ii) OF THE WILD AND SCENIC RIVERS ACT.

While only the Cranberry is considered suitable for inclusion in the National System under Federal administration at this time, any of the eligible segments may be added to the National System under Section 2(a)(ii) of the Wild and Scenic Rivers Act. Should the State decide to apply for designation, the managing entity would have to adopt a program of action which would provide

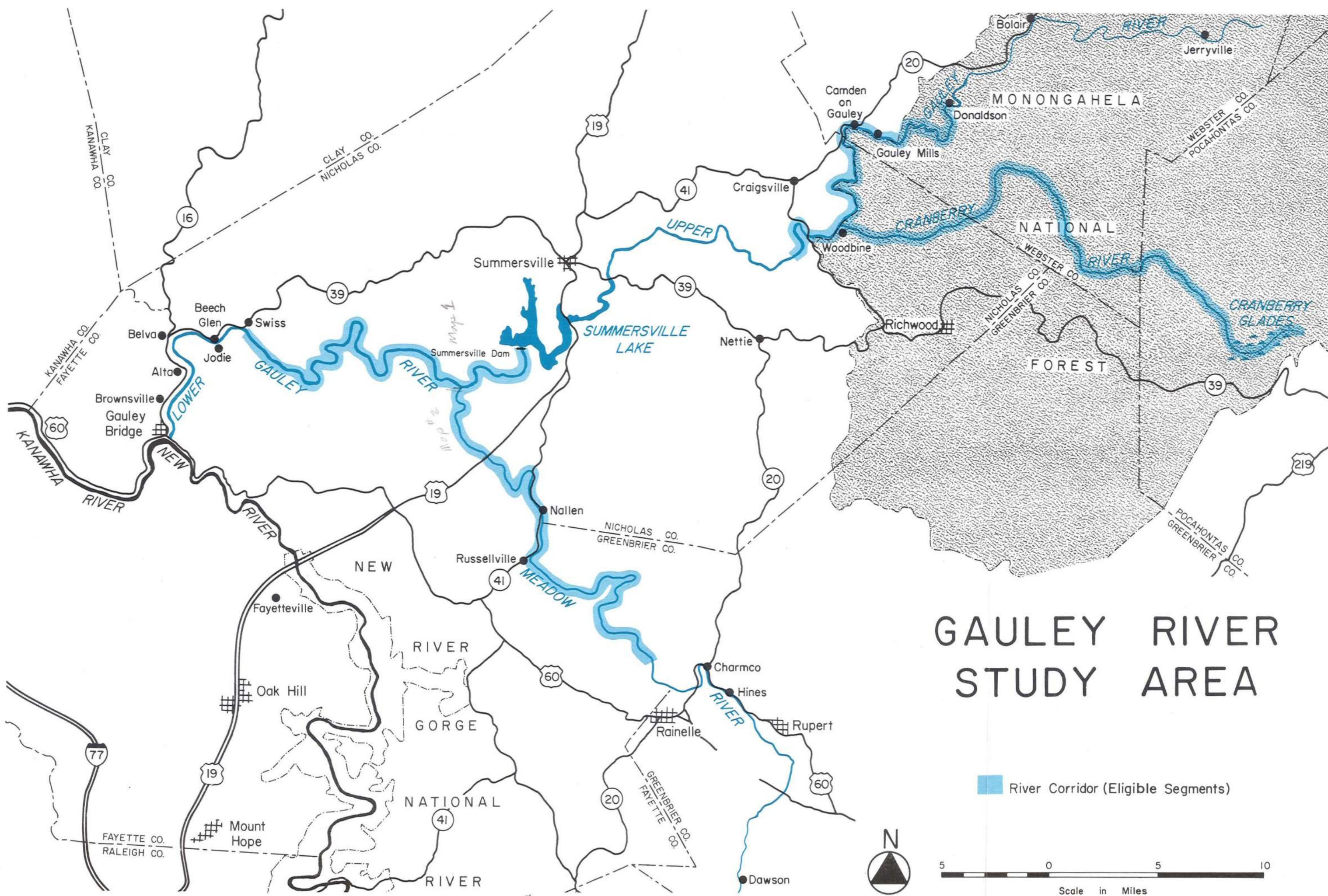
permanent protection for the natural and cultural qualities of the river and its immediate environment. Section V. D of this report, Consideration for the National System, discusses the procedure for including a river in the National System under Section 2(a)(ii) of the Act. Because of its status as one of the most outstanding white water rivers in the United States, its popularity with kayaking and white water rafting enthusiasts , and the potential for hydroelectric development which would adversely affect these resource values, some local support has developed for inclusion of the lower Gauley as a State/locally administered river. However, no definite steps have been taken towards this end.





Lower Gouley whitewater





GAULEY RIVER STUDY AREA

II. CONDUCT OF THE STUDY

Purpose

The purpose of this study is to determine whether the Gauley River and two of its tributaries, the Cranberry and Meadow Rivers, are eligible for addition to the National Wild and Scenic Rivers System and whether any eligible segments are suitable for inclusion in the National System based on such factors as the significance of resource values present, threats to these values, and extent of public lands in the river area; costs of acquisition, development, management and operation; public, local or State interest in acting to protect and manage the river; and the feasibility and timeliness of such action.

This report on the Gauley River and two of its tributaries was prepared under authority of the Wild and Scenic Rivers Act (Public Law 90-542) enacted in October 1968 which stated:

It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

Background

The main stem of the Gauley and two of its tributaries, the Cranberry and Meadow Rivers, were authorized for study as potential components of the National Wild and Scenic Rivers System under Public Law 95-625, which amended Section 5(a) of Public Law 90-542 in 1978. It is one of four rivers in West Virginia which are being studied by the National Park Service; the others being the Bluestone, Birch, and Cacapon. In addition, the Greenbrier River is being studied by the U.S. Forest Service.

Study Approach

The study of the Gauley River for potential addition to the National Wild and Scenic Rivers System was a cooperative effort under the leadership of the National Park Service.

On-site inspections and data collection were accomplished by an Interagency Field Task Force composed of the following representation:

Federal Energy Regulatory Commission
Division of River Basins

U.S. Department of Agriculture
Forest Service

U.S. Department of Defense
Army Corps of Engineers

U.S. Department of the Interior
Bureau of Mines
Fish and Wildlife Service
Geological Survey
National Park Service

U.S. Environmental Protection Agency
Water Quality Office

State of West Virginia
Department of Natural Resources

Ohio River Basin Commission

The counties in the study area were invited to participate as observers.

A field trip was conducted in October 1979 to evaluate the study area. The study team was assisted by local individuals on the evaluation trip. The study team then met to discuss whether the river was eligible for the National System and, if so, how it should be classified.

The study team has determined the eligibility of the Gauley River and two of its tributaries, Cranberry River and Meadow River, for inclusion in the National System and has prepared other information required by Congress.

Public Involvement

An initial public meeting to discuss the purpose of and plans for conducting the study was held at Summersville on October 10, 1979. Public meetings were held on December 14 and 15, 1981 near Craigsville and at Summersville to discuss findings of the study and possible alternative actions to protect segments eligible for the National System.

A series of workshops were held in cooperation with the State to obtain the views of private interests in the study area. The first, with coal and timber interests, was held at Hawks Nest State Park on December 15, 1981. The second was held at Pipestem State Park on December 17, 1981 with conservationists and white water recreation outfitters. A follow-up workshop was held on January 27, 1982 for the outfitters who were unable to attend the earlier meeting.

There has been informal consultation with county and local government officials, conservation groups, private individuals and landowners in the study area since the study was initiated.

State agencies were contacted with the assistance of the State Department of Natural Resources. The State Historic Preservation Officer (SHPO) prepared a short report on the cultural resources of the study area under contract with the National Park Service.

Significant Issues

The issues outlined below were identified by the study team through contacts with concerned public agencies, organizations, and individuals.

Hydropower Development - The U.S. Army Corps of Engineers has proposed a hydropower facility at or near the existing Summersville Dam. There are two basic plans: (1) a power station at the existing dam or (2) a power station three miles downstream from the existing dam with a mile-long tunnel bypassing the river. A hydropower facility at the existing dam would provide two-thirds the amount of power as the long tunnel alternative, however, the latter alternative would eliminate three miles of superb white water from the Gauley River. On the other hand, operation of a hydroelectric facility has the potential to provide more even flows and increase the white water boating season. The inclusion of a multistage release tower in a power project would create a three-mile segment of manageable cold-water fishery but the low flows would not be suitable for recreation boating.

The City of Summersville has also proposed a hydropower project at the existing Summersville Dam. It would consist of penstocks which would utilize the existing outlet works in the right abutment of the dam, or a completely new intake structure. Project energy would be utilized for municipal power needs and would also be sold to public and private utilities.

Coal Mining Activity - Coal mining activity, particularly surface mining, is scattered throughout the Gauley River region but within the study area is concentrated along the upper Gauley. Surface mines along the uppermost and lowermost reaches of the Gauley are intrusions that help disqualify these stretches for the National System. Coal mining interests feel that designation of certain segments of the Gauley River would adversely affect the coal mining activity. Designation could place restrictions on haul roads in the corridor and it would trigger additional water quality restrictions. Section 522(e) of the Surface Mining and Reclamation Act would prohibit new surface mining activity along any designated river segment.

Timber Management - Merchantable timber exists on some land within the Gauley River area. Innovative solutions for preserving river values in the river area and accommodating timber management practices may be sought if the Gauley is designated.

Fisheries Management - Planning decisions will have to be made with regard to the fishery below Summersville Dam, including water temperature, flow regimes, and species maintenance with or without hydropower development.

White Water Use - Extensive use of the lower Gauley for commercial and private white water boating may have created problems of overuse and conflicts with other recreational uses such as fishing.

Definitions of Terms Used in Report

Study Area: The entire main stems of the Gauley, Cranberry and Meadow Rivers and their immediate environments, which, in this study, is the area extending one-quarter mile from each riverbank.

River Area: That part of the study area and its immediate environment eligible for inclusion in the National System.

Study Segments: The rivers themselves, which include the main stems of the entire Gauley, Cranberry and Meadow Rivers.

Region: The surrounding environment of the study area, extending for several miles or more, which affects and is used to describe the river for study purposes. The boundary is indefinite (e.g. Fayette, Nicholas, Webster, Greenbrier, and Pocahontas Counties for population data, the watershed for stream flow data).

Designation: Inclusion of a river area in the National System either by act of Congress or by authority of the Secretary of the Interior.

Eligibility: Qualification of a river for inclusion in the National System through a determination that it is free-flowing and with its adjacent land area, possesses at least one outstandingly remarkable value.

Eligible Segment: The portion of the study segment which is eligible for the National System. (See River Area)

River Corridor: In preparing a river management plan the river corridor boundary may be more or less than the one-quarter mile distance from each riverbank.

Classification: The determination of which of the classes outlined in Section 2(b) of Public Law 90-542 (wild, scenic, or recreational) best fit the river or its various segments.

Suitability: A determination as to whether an eligible segment should be included in the National System by weighing natural and cultural resource values and threats to these values with such factors as extent of public lands in the river area; costs required for acquisition, development, management and operation; public, local or State interest in acting to protect and manage the river; the feasibility and timeliness of such action.

III. EVALUATION

The natural and cultural resource values of the Gauley, Cranberry and Meadow Rivers are described in detail in Chapter IV of this report. They are summarized in this chapter in sufficient detail to establish the outstandingly remarkable values of the qualifying segments.

The Gauley River and two of its major tributaries, the Cranberry and Meadow, are located within a day's drive of some of the heaviest population concentrations in the nation. The natural environments of the qualifying segments are unique in a number of respects. The most significant values are highlighted here:

Much of the qualifying river segments are entrenched in rugged v-shaped valleys supporting a luxuriant forest cover topped by lofty rock outcrops and palisades. Cascading white water and boulder-strewn courses are enclosed by heavily forested valleys and support a conclusion that portions of the river area possess high scenic quality.

The upper reaches of the rivers flow through wetlands, the most notable of which is the Cranberry Glades Botanical Area, which has been designated as a National Natural Landmark. This designation provides protection for the southernmost location for such species as Dwarf Dogwood, Gold Thread, Oak Fern, Wild Buckbean, and Bog Rosemary.

The Summersville Dam and Summersville Lake separate the upper from the lower Gauley, where releases from the dam can augment low flows and enhance white water boating, primarily during the months of April and October.

The lower Gauley is among the most challenging white water rivers in the nation with extensive boulder-strewn rapids, high ledges, narrow chutes, "souse holes," "stoppers," and tortuous channels. The lower Meadow is even more demanding due to its narrow channel and very steep gradient. Good white water conditions also occur on the upper Gauley, and the Cranberry is extensively used for kayaking in the spring. Commercial rafting occurs only on the lower Gauley.

In addition to the exceptionally challenging white water, recreational activities include superb opportunities to fish, camp, hike, and view the scenery from commanding overlooks. Water quality is suitable for primary contact recreation. The forests contain diverse and abundant wildlife, and large forested areas promote very high air quality.

Eligibility

It has been determined that the 24.6-mile stretch of the upper Gauley River between its confluence with Williams River and its confluence with Panther Creek and the 25.7-mile stretch of the lower Gauley between Summersville Dam and Swiss, the entire Cranberry River (33.4

miles), and the 27.8-mile stretch of the Meadow River between Meadow Creek and its confluence with the Gauley are eligible for inclusion in the National Wild and Scenic Rivers System. The stretch of the Gauley River from the Williams River juncture upstream to its headwaters, the Gauley downstream from Panther Creek to Summersville Dam, the Gauley stretch from Swiss downstream to the New River, and the Meadow River upstream from its confluence with Meadow Creek to its headwaters are not eligible for inclusion in the National System.

The basis for determining the eligible river segments is as follows:

1. The segments are in a free-flowing condition.

Although Summersville Dam impounds 18 miles of the Gauley River, there are no slack water or other modifications within the qualifying stretches. The stretches possess a variety of natural flow conditions from calm pools to riffles to outstanding white water.

2. The segments and their immediate environments possess outstandingly remarkable scenic and recreational values. Their geologic and fish and wildlife values are also significant but not outstandingly remarkable.

All qualifying stretches rank high in aesthetic value. In many places, spectacular white water cascades between huge boulders which lie entrenched in heavily wooded gorges. Along the lower Gauley, rock outcroppings near the ridge tops form palisades which add to the natural beauty of the river corridor.

The superb white water of the lower Gauley and lower Meadow and splendid fishery provided by the Cranberry are the prime recreation attractions of the qualifying stretches. The upper Gauley gorge also offers good white water in a rugged, relatively unspoiled setting. These river areas are ideal not only for white water rafting and kayaking but hiking, climbing, sightseeing, nature study, and serious photography.

Geologically, the area contains old formations. Boulder-strewn courses, deep gorges, and colorful sandstone outcroppings are significant geologic features.

The Cranberry River supports a significant cold water fishery and its immediate environment supports wildlife species typical of a wilderness area in the region. These include brook and rainbow trout and wild turkey and black bear.

In addition, the segments normally have a sufficient flow and level of water during years of normal precipitation to permit full enjoyment of water related outdoor recreation activities generally associated with comparable rivers, and to sustain the

outstandingly remarkable values for which they would be designated. Stream flows have seasonal variations, with high and medium-high flows during late winter and spring which increase velocity and vary wave patterns. Summer and early autumn flows slacken and boating activity decreases accordingly. However, releases from Summersville Dam in October provide rafting and kayaking on the lower Gauley in autumn.

The segments are in excess of 25 miles in length, which is sufficient to provide a meaningful recreation experience.

Overall, the water quality is good to very good, and in some cases certain federally approved West Virginia water quality standards are exceeded. The water quality is good enough to meet the criteria for aesthetics, the propagation of fish and wildlife, and for primary and secondary contact recreation.

In summary, the specified segments of the Gauley, Cranberry and Meadow Rivers and their immediate environments are eligible for designation.

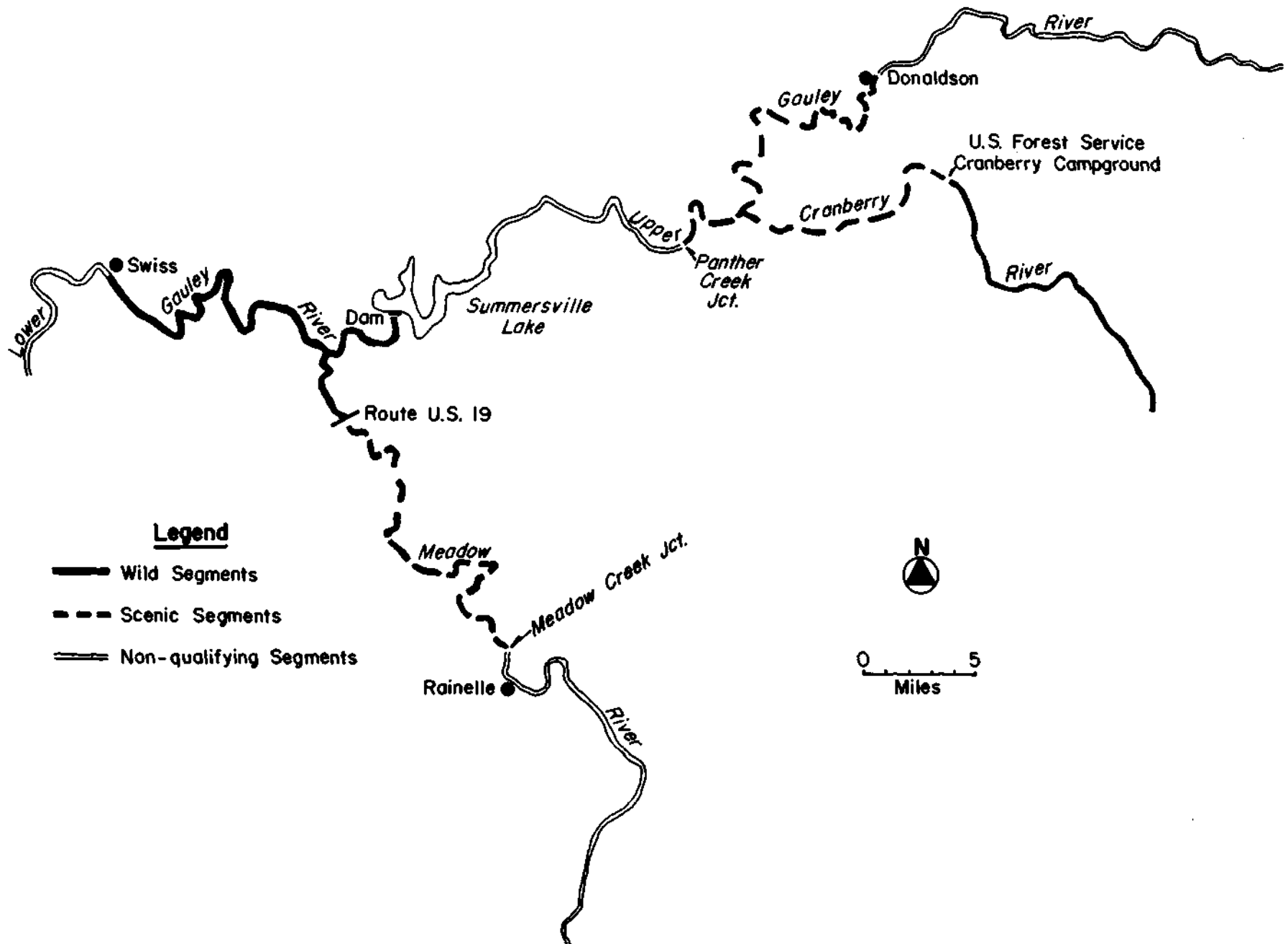
The 28-mile stretch of the upper Gauley from its headwaters to the Williams River juncture, the 20 miles between Panther Creek and Summersville Dam, the 10-mile stretch of the lower Gauley between Swiss and its confluence with the New River, and the 30-mile stretch of the Meadow River from its headwaters to Meadow Creek do not qualify for inclusion in the National System. The uppermost and lowermost Gauley stretches are impacted by strip mining activity and related acid mine drainage, paralleling roads or railroads and bridges, powerlines, clearings and residential development. The upper Meadow stretch is affected by siltation from agricultural activity, paralleling roads and the development of an interchange for I-64 near Dawson, and residential development. Because of their small size, the upper Meadow and upper Gauley above Williams River do not support the recreational activities normally associated with components of the National System. None of these river segments have any outstandingly remarkable values.

Classification

Following a determination that segments of the Gauley and Meadow Rivers and the entire Cranberry River qualify for inclusion in the National Wild and Scenic Rivers System, the following criteria provided by Section 2(b) of the Act were taken into consideration to determine potential classification:

Wild river areas -- Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

QUALIFICATION AND CLASSIFICATION OF THE GAULEY, CRANBERRY AND MEADOW RIVERS



Scenic river areas -- Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational river areas -- Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The qualifying segments would be classified as wild and scenic. The upper Cranberry River (20.4 miles), lower Gauley River (25.7 miles), and the lower Meadow River (4.5 miles) downstream from U.S. Route 19 bridge qualify as wild rivers. The remaining lower Meadow River (23.3 miles), the upper Gauley (24.6 miles), and the lower Cranberry (13.0 miles) qualify as scenic rivers.

These classifications are based primarily on the following factors:

The wild river segments are:

1. Free of impoundments.
2. The water quality generally meets the federally approved West Virginia standards for primary contact recreation, aesthetics, and fish and wildlife propagation and are "unpolluted" as required under wild classification.
3. The river corridors are essentially primitive, being almost free of structures and other evidence of human activity.
4. They are generally inaccessible by road. Most of the light-duty gravel road paralleling the Cranberry River is closed to all public vehicular traffic by gates that are controlled by the U.S. Forest Service. A well-screened, lightly-used, single railroad track with two trains daily parallels the lower Meadow and much of the lower Gauley.

The scenic river segments are:

1. Free of impoundments.
2. The water quality generally meets the federally approved West Virginia standards for secondary contact recreation, aesthetics, and fish and wildlife propagation, but waters are not "unpolluted" as required under wild classification.

3. Their shorelines are still largely primitive and largely undeveloped showing little evidence of man's intrusion. Small rural hamlets or concentrations of habitations are limited to relatively short reaches.
4. They are accessible in places by road. Lightly-traveled roads and railroads parallel or occasionally reach and bridge the segments. Transportation networks are usually well-screened and only visible along short stretches.

Suitability

If river segments and their immediate environments are found eligible for addition to the National Wild and Scenic Rivers System, a determination must be made by the Secretary as to whether they are suitable for addition to the National System. A determination of suitability is based on such factors as the significance of resource values present, threats to these values, and extent of public lands in the river area; costs of acquisition, development, management and operation; public, local or State interest in acting to protect and manage the river; and the feasibility and timeliness of such action.

The entire Cranberry has extensive National Forest System lands in the river area. In addition, in January 1983, Congress designated a portion of the National Forest land along the Cranberry River as wilderness, thus giving added protection emphasis to the River. The Cranberry is also a component of the West Virginia Natural Streams Preservation System. The Forest Service expects to continue current management practices for the remaining portions of the Cranberry Backcountry and Cranberry Glades Botanical Areas and will implement wilderness protection and management for that portion of the lands designated along the Cranberry River. Therefore, the Cranberry already enjoys a substantial amount of protection and is suitable to be a federally administered component of the National System.

The scattered National Forest System lands along the upper Gauley are insufficient to protect the river area without implementation of State and local government land use controls. Because these controls have not materialized, this stretch has been found unsuitable for inclusion in the National System under Federal administration.

The lower Meadow and lower Gauley are found unsuitable for the same lack of interest as the Upper Gauley plus there is an absence of public land in the river area.

Although some local support is developing for inclusion of the lower Gauley as a State and locally-managed river in the National System, no action has been taken.

The Secretary of the Interior has authority, under Section 2(a)(ii) of the Wild and Scenic Rivers Act, to include state-administered eligible segments in the National System if certain conditions are met. (These conditions are provided in Section V. D of this report, Consideration for the National System.)





Upper Gauley near Jermyville



Upper Gauley near Maryhill



Cupperneck Bend of the Upper Gauley

IV. THE RIVER ENVIRONMENT

This section provides a description of the natural resources, cultural resources, existing public use, and status of land ownership and use.

Natural Resources

Drainage Basin and River - The North, Middle, and South Forks of the Gauley River form in Pocahontas County at an elevation of approximately 4,000 feet above mean sea level. The main stem of the Gauley flows in a west-southwest direction to its confluence with the New River to form the Kanawha River. The main stem of the Gauley is 108 miles long, occupies a drainage basin of 1,420 square miles, and has an average gradient of 31 feet per mile.

The upper Gauley lies upstream from Summersville Lake, while the lower Gauley is located downstream from Summersville Dam. The upper Gauley has formed a gorge (local relief 500 to 1,000 feet) in a rugged plateau. There are a number of rapids and riffles within this stretch which maintains an average gradient of 40 feet per mile. Between its confluence with Williams River and Summersville Lake the gradient is 17 feet per mile.

Summersville Dam forms Summersville Lake across the gorge near the mouths of Battle Run and McKee Creek. Its normal pool elevation is 1650 feet and it extends approximately 14 miles upstream. In the vicinity of the dam, the gorge is cut nearly 500 feet below the level of the plateau.

The Gauley flows through the gorge for approximately 24 miles immediately downstream from Summersville Dam. The stream gradient in the gorge is 26 feet per mile. Within the gorge, the river is characterized by alternating pools and rapids with torrential water, boulders and expose bedrock. The lower Gauley is noted for its outstanding white water and is recognized as one of the most technically-demanding and popular commercially-run whitewater rivers in the nation. It is recommended only for kayakers with an expert rating or by commercial raft trip.

After the Gauley leaves the widened gorge at Swiss, the river flows at an average gradient of only three feet per mile to its confluence with the New River at Gauley Bridge.

The Cranberry River, a tributary of the Gauley, rises in Pocahontas County at approximately 4,600 feet elevation and flows west-northwestward to its confluence with the Gauley River at Cranberry Station (1,920 feet elevation). The total length of the river is 33.4 miles; the average gradient, 86 feet per mile. The watershed is 70 square

TABLE 1. SUMMARY OF RIVER CHARACTERISTICS

The River Basin
 Located in: Pocahontas, Randolph, Webster, Greenbrier, Summers, Nicholas, Fayette, Clay, and Kanawha Counties

1420 square miles in area

Gauley River
 Located in: Pocahontas, Randolph, Webster, Nicholas, and Fayette Counties

106 1/2 miles overall river length; elevation change 3330 feet
 24.7 miles of upper qualifying segment (scenic)
 25.7 miles of lower qualifying segment (wild)

4000 feet elevation at source
 2900 feet elevation at confluence of North and Middle Forks
 2180 feet elevation at confluence of Williams River
 1710 feet maximum pool elevation of Summersville Lake
 1650 feet normal pool elevation of Summersville Lake
 1390 feet elevation of river below Summersville Dam
 700 feet elevation at Swiss
 670 feet elevation at mouth

31 feet/mile gradient between source and mouth
 68 feet/mile gradient between source and Williams River Jct.
 17 feet/mile gradient between Williams River Jct. and maximum pool elevation of Summersville Lake
 27 feet/mile gradient between Summersville Dam and Swiss
 3 feet/mile gradient between Swiss and mouth

1442 cfs average discharge at Craigsville
 2694 cfs average discharge at Belva

Cranberry River
 Located in: Pocahontas, Webster, and Nicholas Counties
 33.4 miles overall river length (wild); elevation change 2055 feet
 33.4 miles of qualifying segment (20.4 wild; 13.0 scenic)

3965 feet elevation at source
 1910 feet elevation at mouth
 60 feet/mile gradient between source and mouth
 341 cfs average discharge near Richmond

Meadow River
 Located in: Greenbrier, Nicholas, and Fayette Counties
 58.2 miles overall river length; elevation change 1980 feet
 27.8 miles of qualifying segment (23.3 scenic; 4.5 wild)

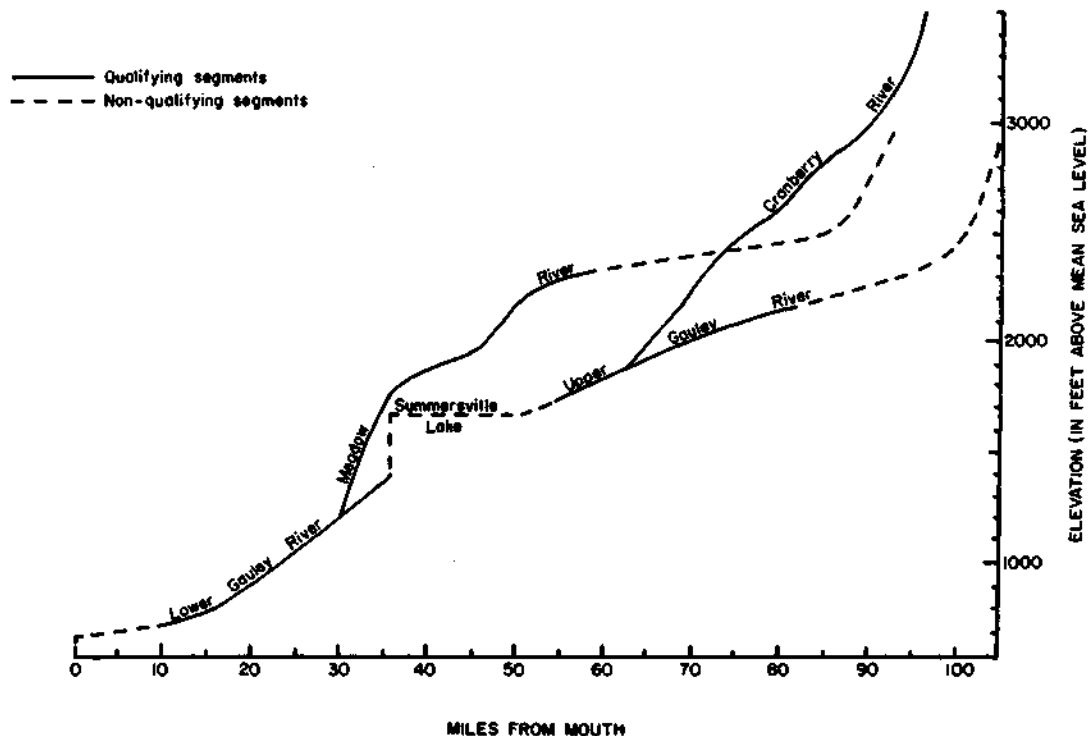
3160 feet elevation at source
 2360 feet elevation at confluence with Meadow River
 1620 feet elevation at U.S. Route 19 bridge
 1180 feet elevation at mouth

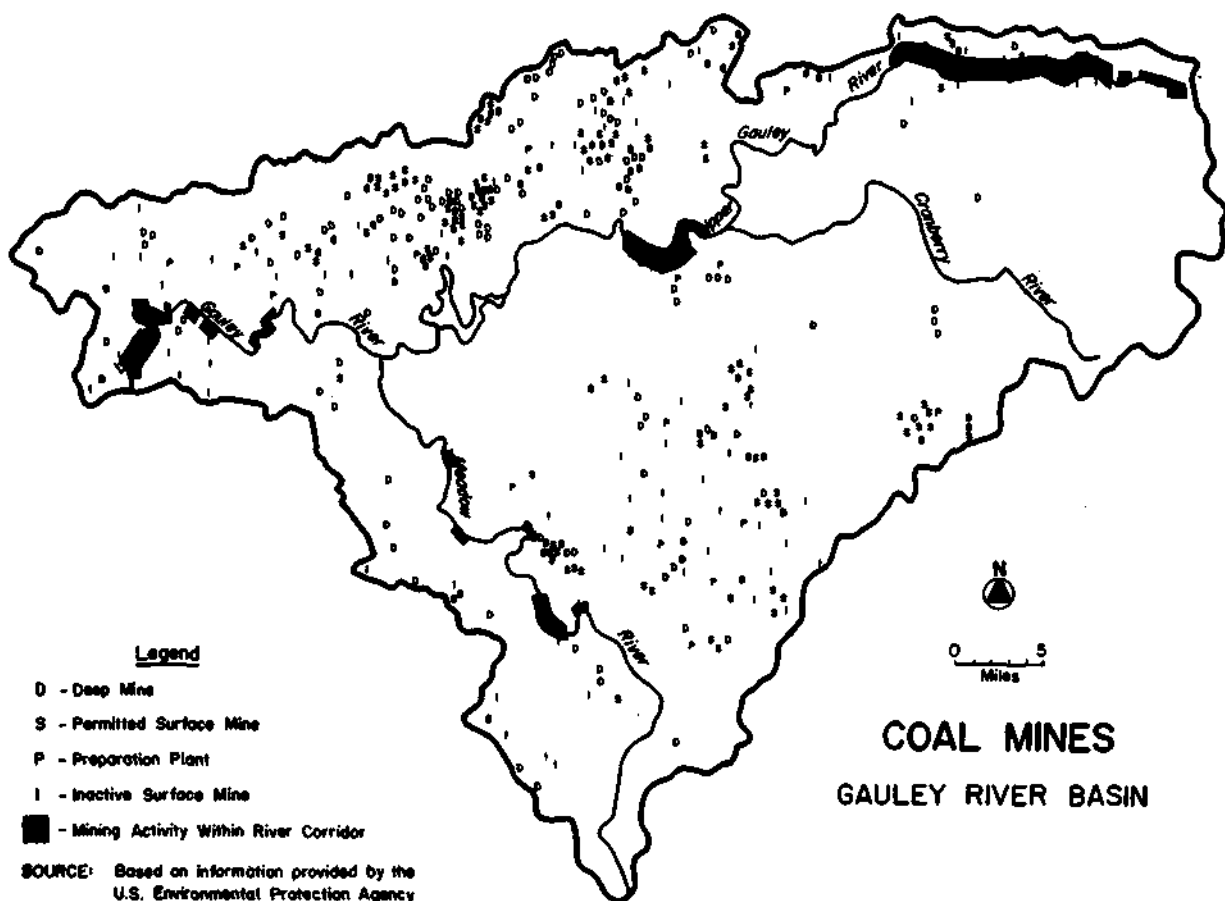
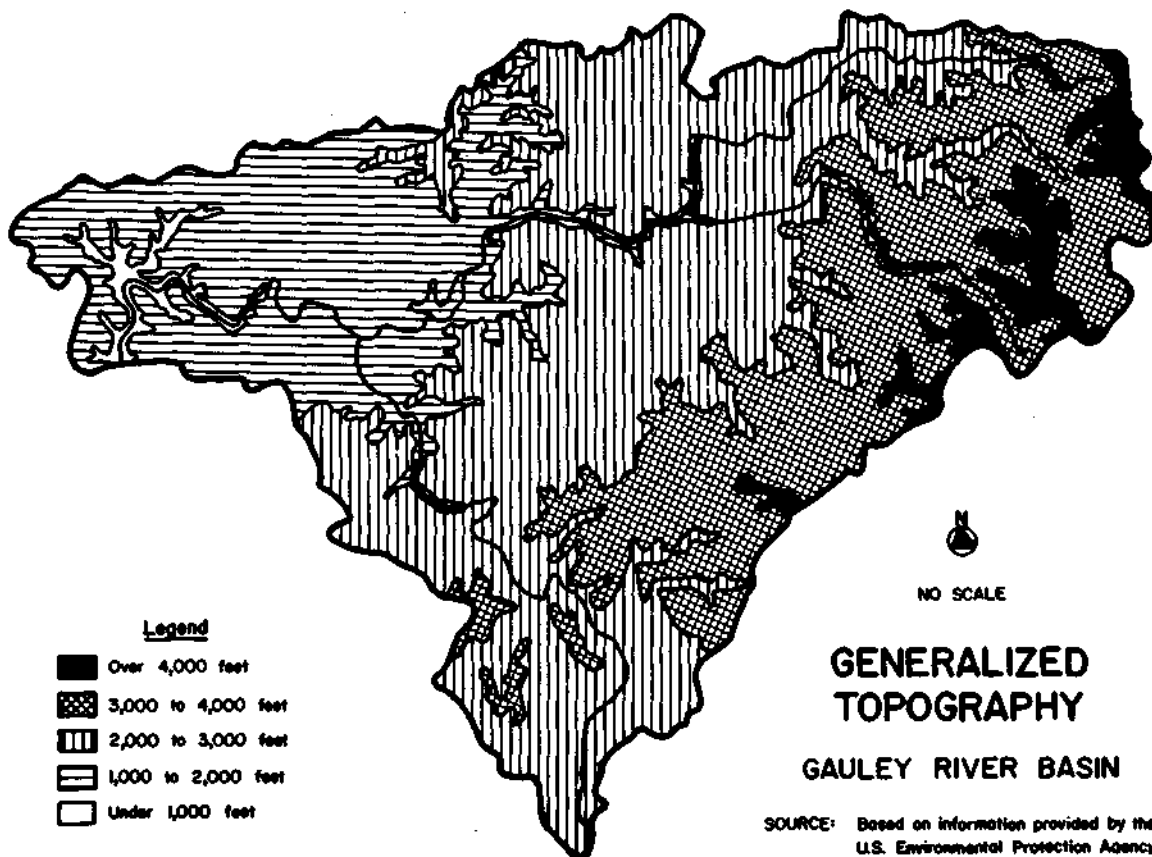
34 feet/mile gradient between source and mouth
 26 feet/mile gradient between source and Meadow Creek
 42 feet/mile gradient between Meadow Creek and mouth
 32 feet/mile gradient between Meadow Creek and U.S. Route 19 bridge
 96 feet/mile gradient between U.S. Route 19 bridge and mouth

762 cfs average discharge near Mt. Lookout

PROFILE

GAULEY RIVER (including Cranberry and Meadow River)





miles in area. Associated with the river is the Cranberry Backcountry and Cranberry Glades, administered by the U.S. Forest Service. The backcountry approximated 53,000 acres, of which 26,000 acres (of the 35,600 acres designated) have been designated wilderness. That portion of the backcountry not designated as wilderness will continue to receive special management considerations.

The Meadow River, a major tributary to the Gauley River, begins in northeastern Summers County at approximately 3,700 feet and flows northwestward to its confluence with the Gauley River. Its total length is 58 miles; its average gradient, 34 feet per mile, generally increasing downstream. Meadow River headwaters are along the broad Appalachian Plateau, but in the last nine miles it enters a scenic gorge to Carnifex Ferry. In this lower stretch, the gradient averages 71 feet per mile but exceeds 100 feet per mile in places and is not considered runnable by raft.

Hydrology - High flows usually occur in late winter and early spring when large scale storms cross the area and melting snow and ice occur. The lowest flows usually occur in late summer and early autumn when evapo-transpiration exceeds precipitation. Since 1964 the flow of the upper Gauley near Craigsville averaged 1,442 cubic feet per second (cfs); its maximum flow was 40,700 cfs, and its minimum, 13 cfs. The lower Gauley near Belva (since 1928) averages 2,694 cfs, maximum flow was 105,000 cfs, and its minimum, 3 cfs. Recent recorded flows of the Cranberry River near Richwood show a mean of 341 cfs, a maximum of 916 cfs, and a minimum of 73 cfs. The lower Meadow River near Mt. Lookout has recorded flows (since 1966) of 762 cfs as a mean, 18,500 cfs as a maximum, and 14 cfs as a minimum.

Water Quality - The overall water quality of the Gauley, Cranberry, and Meadow Rivers is good. Although the Gauley and Meadow receive intermittent acid mine drainage, the water quality is not severely degraded. Municipal sewage discharge has been a problem in the Gauley basin but sewage treatment upgrading programs are being instituted for the Gauley River Public Sewer District. Summersville Dam cools the water temperature in the lower Gauley which makes it unsuitable for a productive warm water fishery. Silt and sediment are introduced into the river by poor forestry and agricultural practices.

The West Virginia Department of Natural Resources, Division of Wildlife Resources has identified the Cranberry and Meadow Rivers as high quality streams. These streams either contain native trout populations, are stocked with trout, or are warmwater streams more than five miles in length which have both desirable fish populations and public use. The entire Cranberry has been designated as trout waters which have stringent requirements for dissolved oxygen and temperature, particularly in spawning areas. The entire Gauley and Meadow can support trout, but the upper Gauley can lose its ability support fish during low water levels when the effect of mine acid

discharges increase. The Cranberry is a low nutrient stream characterized by high water quality and low alkalinity. It is not a highly productive stream for aquatic biota but it does support trout.

In the upper Gauley, pH levels sometimes fall below West Virginia water quality standards. The upper Cranberry averages below acceptable levels due to natural conditions. Optimum dissolved oxygen levels are exceeded at various places in the Gauley and Meadow, while coliform bacteria are exceeded near communities of the Meadow River. Arsenic and selenium concentrations are excessive in the lower Gauley, lower Cranberry, and lower Meadow. Barium concentrations are high in the lower Cranberry and in the Meadow near Nallen. Cadmium, chromium, lead, and selenium concentrations exceed the standards at various locations of all three rivers. Phenols are present in the Meadow. Silver concentrations exceed the standards in the Summersville Lake area and near Rainelle and Nallen in the Meadow. (See Appendix II for water quality data and West Virginia Water Quality Criteria.)

Air Quality - There are no major industrial air pollution sources in the Gauley River Basin and the air quality is generally good. Westerly winds over the industrialized Kanawha Valley may carry air pollutants eastward into the region, however.

The Gauley region is notable for naturally poor atmospheric dispersion which concentrates air pollutants at a source. Nevertheless, the transport and diffusion of pollutants may vary sharply over short distances in hilly terrain. In narrow, steep-walled valleys that experience frequent radiation inversions below the crest, transport of pollutants may be limited to lateral flows and diffusive mixing with other air masses is usually inhibited resulting in air stagnation. In the basin stagnation conditions involving poor dispersion lasting four days or more occur once or twice a year, while a 7-day stagnation occurs once in five to seven years. Nocturnal air movements in these valleys also play a role in allowing a high pollution potential. The high frequency of daylight cloudiness in winter and spring tends to prolong the high pollution potential period.

The most recent EPA designations of attainment status with respect to meeting the National Ambient Air Quality Standards (NAAQS) show differences at various locations in the region. The extreme western portion does not meet the primary standard for total suspended particulates. The remainder has lower suspended particle concentrations than the NAAQS. The western portion of the region also does not meet the primary standard for oxidants; the remaining portion of the region is unclassifiable for oxidants due to a lack of data. Air quality is regarded as better than the NAAQS for sulfur dioxide, but unclassifiable for carbon monoxide and nitrogen dioxide because of a lack of data. There are no standards for dustfall concentrations (settling solids), but they have generally decreased significantly in the Kanawha Valley in the past decade. Ambient concentrations of total suspended particulates also have decreased over the past decade.

The Cranberry Wilderness will remain a Class II air quality area. However, the State has the option to redesignate it as a Class I area by Section 164(a) of the Clean Air Act, as amended August 1977.

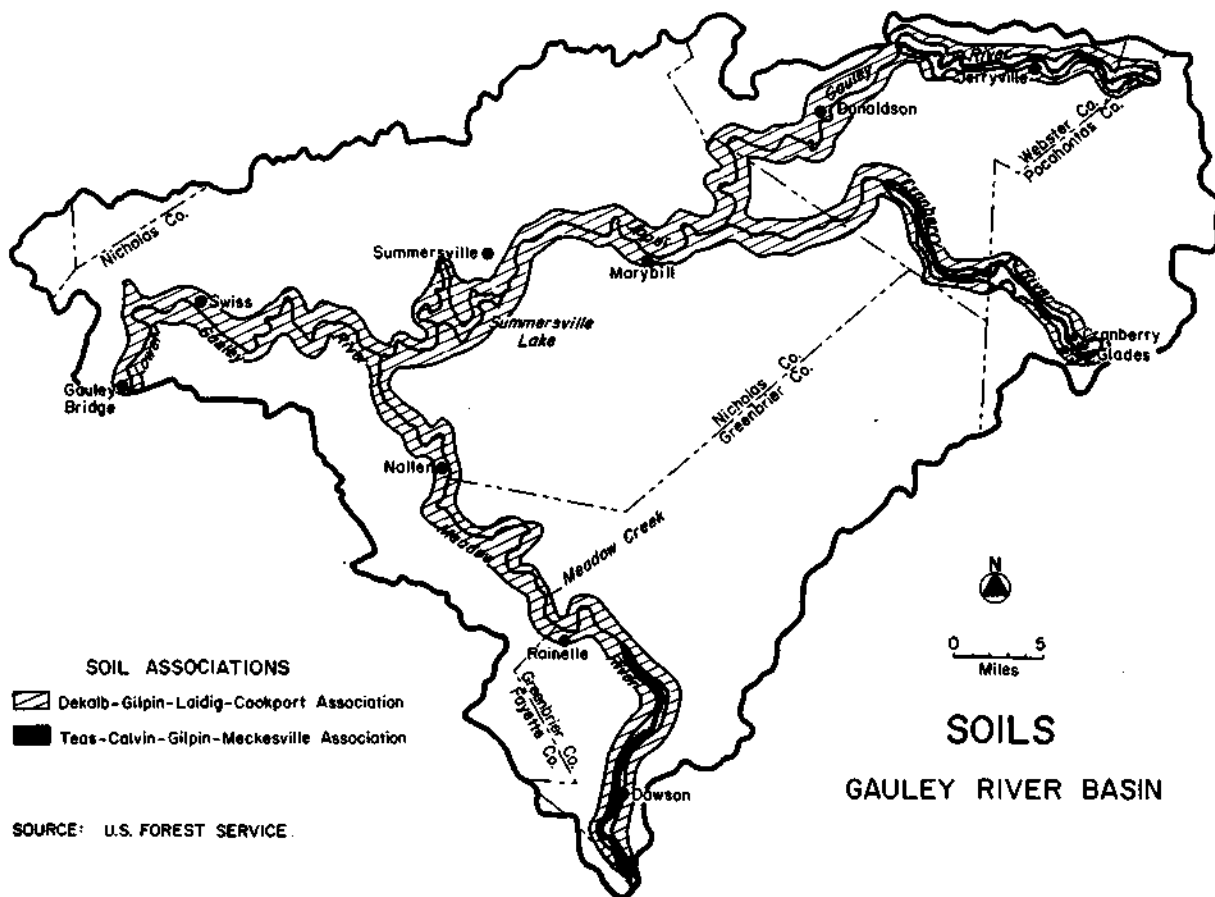
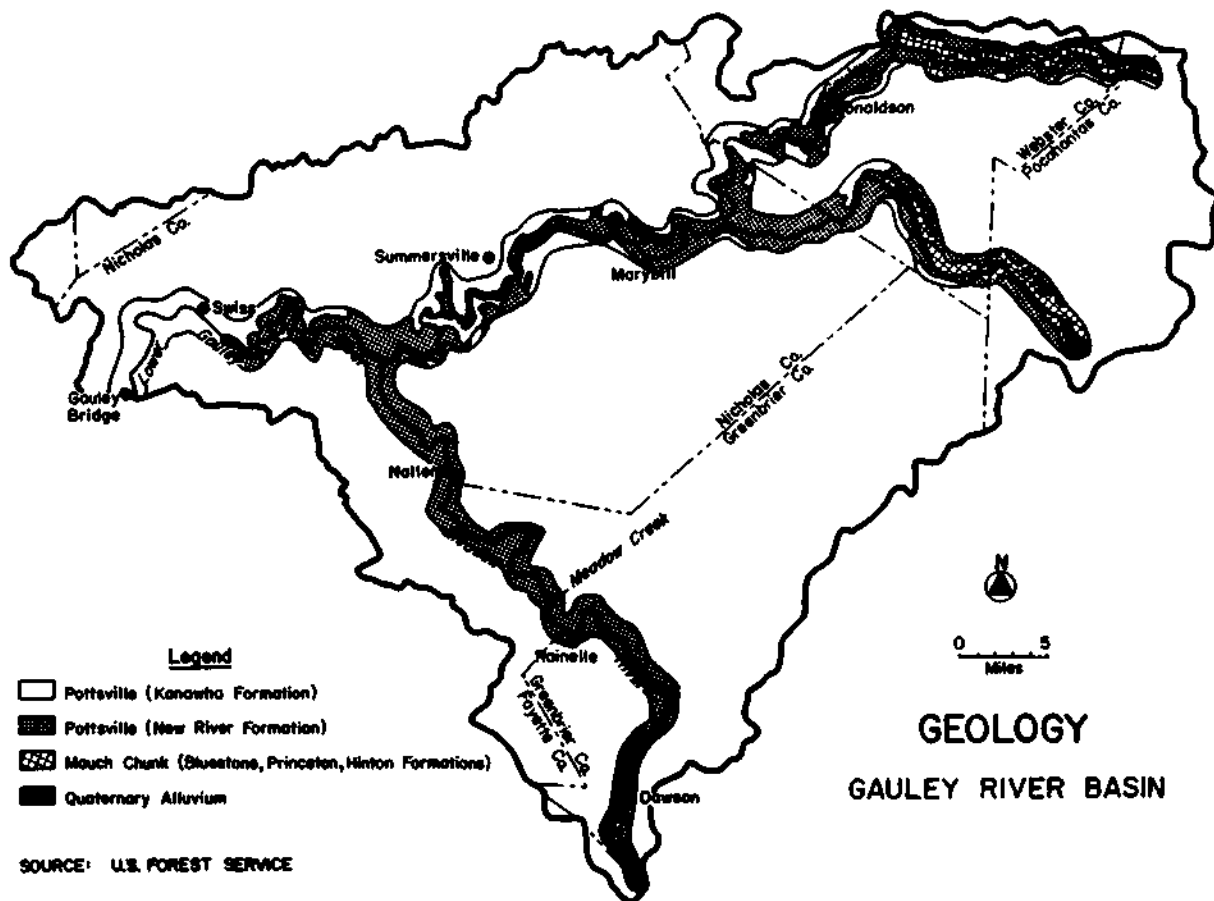
Geology and Mineral Resources - The Gauley River watershed is a part of the Unglaciated Allegheny Plateau. The high knobs and ridges are thought to represent portions of the Schooley peneplain developed about 230 million years after the Appalachian orogeny. The rock strata are more than 300 million years old. The streams have deeply dissected these uplifted rocks, leaving a complicated topography of deep young stream valleys with narrow, steep side-slopes broken by steep-benched slopes. They have exposed Carboniferous rocks of Paleozoic age ranging from the Pennsylvanian (Pottsville Group) to the Mississippian (Mauch Chunk Group). The tops of these mountains are relatively flat as they are capped with resistant Pottsville conglomerate. These and other resistant rocks form cliffs along the edges of the ridges and also farther down the mountainsides.

The Pottsville Group is divided into three formations: the Kanawha, New River, and Pocahontas. All three formations are predominantly sandstone with some shale, siltstone, and coal. The coalbeds within these formations are used as stratigraphic markers. Intervals between the coalbeds vary and contain proportions of sandstone, siltstone, and shale which differ from place to place.

The Mauch Chunk Group is composed of four formations: The Bluestone, Princeton, Hinton and Bluefield. All except the Princeton Formation are characterized by thick shale sections, usually red in color, but also green and gray. The shale units are potential resources for building brick and lightweight aggregate. The Princeton Formation is a massive pebble conglomerate or sandstone unit, which can be used as a stratigraphic marker bed due to its persistent nature. The sandstone conglomerate are aggregate, concrete sand and mortar sand resources. No economic coals have been found in the Mauch Chunk Group.

In 1977, there were 151 surface mines, 149 deep mines, and 16 preparation plants in the region. The map on page 20 shows the location of these mines. Fewer than one-half of the surface mines and more than 60% of the underground mines were active during this period. Most of the mines are located north of Summersville Lake. A smaller, more scattered cluster of mines is located east of the Meadow River. Within the river corridor, coal mining activity is concentrated along the uppermost twenty miles of the Gauley River, the eight miles just downstream from its confluence with the Cranberry and maximum pool elevation of Summersville Lake and interspaced along the lowermost eighteen miles of the main stem. This activity is widely interspaced along the middle section of the Meadow River with the heaviest concentration just downstream from Rainelle.

Future development along the Gauley River will probably be directed both toward surface mining of the thinner, less well-known coals and re-mining and augering of previously-mined coalbeds. Additional information on coal and other mineral resources is contained in the Appendix.



Potential for oil and gas along the Gauley River between Gauley Bridge and Summersville is high. This section of the river flows through the Magnolia Gas Field and near the Lockwood Oil Field. Recent drilling in this area has resulted in significant gas production. Oil and gas resources in the remaining portions of the river area are not significant.

Soil Association - The major portion of the Gauley region consists of upland residual soils, while colluvial soils occupy most of the remainder. The narrow valley bottoms contain alluvial soils that make up a very small percentage of the total land area.

Narrow ridges and upper side slopes have generally moderately deep, well-drained and stony residual soils, while those on broad, flat mountain tops and flat benches are less stony, less well drained and generally deeper to bedrock. Colluvial soils on lower slopes, in coves, on gently sloping benches and along small streams are deep, well to moderately well-drained, stony and typically have a firm brittle subsoil layer through which air and water pass slowly. Narrow bottom-lands along the major streams have highly variable alluvial soils which are usually deep, cobbly and frequently flood.

Dekalb-Gilpin-Laidig-Cookport association (located throughout most of the study area): Moderately deep and deep, well drained and moderately well drained, very steep to gently sloping, very stony soils developed over predominantly sandstones, interbedded with thin beds of shales and coal. Dekalb and Gilpin soils are moderately deep and well-drained. They occur in mixed patterns on side slopes and ridges. Dekalb soils are loamy and slightly droughty; Gilpin soils are more silty and hold water well. Stones and boulders on the surface generally cause moderate to severe limitations on the use of logging equipment. Laidig soils are deep, well-drained, and strongly sloping to moderately steep. They occur on foot slopes and below Dekalb and Gilpin soils. The numerous stones and boulders on the surface limit the use of these soils largely to woodland. Cookport soils are gently sloping to strongly sloping, and about half of them are very stony. They occur on ridges, generally in mixed patterns with Dekalb soils. They are slightly wet and have a slowly permeable layer in the subsoil. Among the minor soils of this association are Nolo, Andover, and Calvin soils on uplands, Pope and Philo soils on bottom lands and Ernest soil on foot slopes. This association is well suited to outdoor recreational development. It is better suited to woodland and recreational uses than to other purposes because of the short growing season, the stones on the surface, and the slope. Such high-value northern hardwoods as hard maple, black cherry, birch, and red oak grow well.

Teas-Calvin-Gilpin-Meckesville association (located in the headwater areas): Moderately deep and deep, well-drained, strongly sloping to steep soils underlain by red, green, and medium gray shale, siltstone, sandstone, and a few thin limestone. The reddish-brown Teas soils occur on strongly-sloping to steep-side slopes. These soils contain many small fragments of stone. They erode easily. The brown Gilpin soils and reddish brown Calvin soils occur together as small patches throughout the association and extensively at the base of mountains. These are steep, stony soils that formed in material weathered from acid siltstone, shale and sandstone. The reddish brown Meckesville soils occur on foot slopes, coves, and around the heads of streams in small areas. These soils are mostly stony and have a slowly permeable layer in the subsoil. They erode easily. Among the minor soils in the association are Cookport, Dekalb, and Clymer soils on ridges and flats, Albrights soils on colluvial foot slopes, Monongahela soils on stream terraces, and Pope, and Atkins soils on bottom lands. The steep and very stony soils in this association are better suited to woodland and outdoor recreation than to other purposes. The less steep areas are fairly well-suited to general crops and pasture. Erosion is generally a severe hazard and has been active in cropped fields.

Vegetation - About one-half of the Gauley River region is covered by deciduous forest, 30% supports mixed forests, less than 10% is occupied by evergreen forests, and the remainder is developed. Evergreen forests occur primarily in the northeastern edge and southwest of Summersville Dam. Mixed forest primarily occupies a portion of the eastern sector, the center and an area northwest of Summersville Lake.

Vegetation is extremely diverse and abundant. Extremes in topography, elevations, and microclimatic conditions have caused a tremendous variety of plant life. In the middle to later 19th century, the region was still nearly totally covered with forest. "Black cherry often attains a height of sixty or seventy feet, before dividing into limbs, and often measures three and a half to four feet across the stump ... The tree grows everywhere, but the largest numbers and the finest for timber are perhaps to be found near the headwaters of the Elk, Gauley, Greenbrier and Cheat Rivers, ... Many large and fine trees, four feet in diameter, are found on Cherry and Williams River ... Trees here may be found long enough for three and four sixteen foot cuts."*

* Maury, W.F. and Wm. M. Fontaine. 1876. Resources of West Virginia. The Register Co., WV, pp. 116-136.

J.H. Debar wrote in 1870 that "at least 10,000,000 acres (of the 16,640,000 acres of land in West Virginia) are still in all the vigor and freshness of original growth.* While nearly all of the virgin forest was removed during the early 1900s, the productive soils are regrowing a new forest. It is this second growth timber that is now being harvested.

Elevation and slope are both factors in the kind of vegetation patterns present in the region. Elevation differences from the upper Cranberry River watershed to the mouth of the Gauley River range from 4,490 feet to 672 feet. Steep valley slopes are characteristic of all three river valleys with fifty to sixty percent slopes common, and occasionally slopes will exceed seventy percent.

The higher elevations -- above 2,000 feet -- contain some of the southern extension of the northern hardwood forest type. The species found here are mainly sugar maple, red maple, beech, yellow birch and basswood. Intermingled with the northern hardwoods are hemlock and red spruce both as single trees and as small stands. Above 3,800 feet elevation, mountaintop scrub communities called heath barrens occur. Blueberry and huckleberry are abundant here along with laurels, azaleas, and other berry shrubs. Rock outcroppings support lichens, mosses, and ferns.

The lower elevations -- below 2,000 feet -- contain the central hardwood forest type. Tree species found in this timber type are the red oak and white oak groups, yellow poplar, white ash, hickory, walnut, cherry, and white pine.

The western half of the watershed is essentially composed of the oak-hickory association, while most of the eastern half is maple-beech-birch. The mountainous section is covered mostly by the spruce-balsam fir type and a smaller aspen-birch forest.

The two most prominent wetland areas in the basin are the Cranberry Glades and the Meadow River wetlands system. Another smaller wetland area is in the Middlety Creek Valley. The four wetland habitat types present are fresh meadows, scrub swamps, wooded swamps, and bogs. The Cranberry Glades was designated a Natural Area within Monongahela National Forest in 1965. This 750-acre glade is the southernmost location for a number of species, such as dwarf dogwood, gold thread, oak fern, wild buckbean, and bog rosemary.

No plants in the basin are considered threatened or endangered under any state or federal designation.

* Debar, J.H. Disc. 1870. The West Virginia Handbook and Immigrants Guide. Gibbens Bros. Printers, Parkersburg, WV p.109.

Notable plant species found within or near the river areas include: the long-stalked holly, Frasers sedge, stiff aster ragwort, Barbara's buttons, New England blazing star, riverbank goldenrod, nodding pogonia and Kates mountain clover along the Gauley; pale green orchis, and long-stalked holly along the Cranberry; and swamp lousewort, Fraser sedge, Virginia spirea, climbing fern, and ragwort along the Meadow.

Fish and Wildlife - The lower main channel of the Gauley River supports a warmwater fishery with the exception of the tailwaters below Summersville Dam which are stocked with trout on a "put and take" basis. Adverse impacts to the warmwater fishery are presently occurring as a result of cold water discharges from Summersville Dam. These discharges delay, disrupt, and may even eliminate spawning by some species. The growing season is shortened, resulting in slow growth and smaller-than-average fish. Fishery habitat is good in the lower Gauley and improves slightly below the town of Swiss. In 1975, the estimated number of fishermen using the main stem of the Gauley River was 3,300, while the estimated number of days fished was 27,700. The fishery includes brook trout, large and smallmouth bass, catfish, sunfish, walleye, darter, minnow, shiner, dace, sucker, and eel. Of the 21 species recently collected by the U.S. Fish and Wildlife Service in the upper Gauley, the rosyface shiner and bluntnose minnow were most common; of the 27 species collected in the lower Gauley, the mimic shiners, bluntnose minnow, and rosyface shiner were most common.

The Meadow River is a warmwater stream supporting a good sport fishery, primarily for smallmouth and rock bass. Its lowermost six miles has a steep gradient; its pools are usually short and deep and provide excellent feeding and resting habitat for fishes. Riffles and gravel bars provide some good breeding areas for sport and forage fish. Of the 23 species collected, the most common species are bluntnose minnow, bigmouth chub, and rosyface shiner.

The Cranberry River offers a popular put-and-take coldwater fishery, primarily for brook and rainbow trout. In 1975, the mainstem of the Cranberry had 8,700 fisherman with 46,300 days fished. The most common fish are the blacknose dace and fantail darter. Only nine species in all were collected, indicating the apparent effects of intensive logging and some mining in the watershed as well as the naturally low pH waters.

The finescaled saddle darter, Etheostoma osburni, although not rare in West Virginia, is unique and of special interest to the State since it is endemic to the Kanawha River system.

In summary, the Gauley and its tributaries provide the necessary water quality and habitat diversity to support a fairly diverse population of benthic organisms. The aquatic insects present are typical of non-polluted waters. Several species of mayflies, caddisflies, and dobson flies found are intolerant of poor water quality.

The hardwood and conifer forests and rugged terrain of the Gauley River basin support a good variety of forest related wildlife species. Sixty-one species of mammals are known or reasonably can be expected to occur in the area. This total includes game, furbearers, and other mammals. Squirrel, deer, rabbit, grouse, woodchuck, raccoon, fox, turkey and blackbear are especially sought after by hunters. Other mammals inhabiting the area include opossum, otter, weasel, mink, skunk, bobcat, chipmunk, beaver, mouse, rat, vole, muskrat, mole, shrew, and bat.

Twenty-nine reptiles are known to inhabit the study area. The most common reptiles are turtles, lizards, skinks, stink pot, and various snakes which include the rattlesnake and copperhead. Thirty-seven amphibians occur in the area and include frogs, toads, salamanders.

There are 277 species of birds which are known or expected to occur in the river area. This total includes migrants, residents, and casual visitors and also includes game species which have been reintroduced or stocked into the area. Bird species known or expected to inhabit the area at some season of the year include the song birds, raptors, scavengers, and game birds.

The southern bald eagle and the American peregrine falcon are both considered endangered species and are migrants through the region. Kirtland's warbler, also an endangered species, may also pass through. One salamander in the study area listed as a species of scientific interest by the State is the blackbellied salamander, Desmognathus quadramaculatus. The Indiana bat, Myotis sodalis, officially designated an endangered species by the U.S. Department of the Interior, may be found in the Gauley River gorge. The coyote and the eastern cougar (or mountain lion) may be present; their occurrence, however, is questionable.

Cultural Resources

Archeology and History - Prehistoric material is not well documented and sites located to date are not numerous. There are five sites near the river's mouth in Fayette County, about twelve along its course in Nicholas County, and one in Webster County. Most of these are of unknown cultural affiliation, since little artifact material has been recovered during surveys. The earliest evidence of prehistoric use of the river is seen from clovis points (generally cited as "fluted" points), of which a handful have been reported. The users

of these points, collectively referred to as paleo-indian, (13000 to 7000 B.C.), were nomadic big game hunters. Considering the rugged terrain of the Gauley region, it is not surprising that neither big game nor their hunters would frequent the river. Following paleo-indian is the Archaic period (c. 7000 B.C. to 1000 B.C.). These people were hunters and gatherers, but only scattered evidence of them has been found. However, this evidence is dispersed widely about the Gauley River basin, and so it appears that the Archaic peoples did frequent the study area. One such site is a rock shelter near Craigsville. The Woodland period (c. 1000 B.C. to 1000 A.D.) is also represented. Again, however, evidence is fragmentary and appears to be outside the mainstream of those peoples living closer to the Ohio River. Sites with possible Adena affiliation are found near Gauley Bridge and Summersville Dam. Later in the Woodland period a few permanent villages are noted, given as Armstrong or Buck Garden. A prehistoric site near Glade Creek dates from the Armstrong culture. Both of these are related to the amalgam of Adena-Hopewell which is more evident to the west of the area, toward the Ohio River. Sites of this type are found near the mouth and up to Cowen. The final prehistoric phase, called Fort Ancient, is represented by sporadic use of rock shelters along the river especially in Summersville area. Near the mouth of the Gauley, there is more evidence of settled village occupation, especially toward the south, in the vicinity of the confluence of the Greenbrier and Bluestone Rivers with the New River. Archaic peoples roamed over the area and later peoples were more concentrated near the mouth of the Gauley.

At the beginning of the historic period, after c.1700, there is noted a general lack of aboriginal habitation in this entire region. One reason appears to be that southern West Virginia was a buffer area between the Iroquois to the north and the Cherokee to the south. Early settlers found evidence of land use such as cleared fields and numerous trails but few Indians. The primary trail of the region, generally followed by General Andrew Lewis (Virginia Militia) in 1773-74 who enlarged it, went from Gauley Mountain to the Kanawha River and became part of the James River-Charleston turnpike.

The rugged topography and limited access routes hindered settlement along the river. Sporadic Indian activity during the French and Indian War and Lord Dunmore's War in the third quarter of the 1700's likewise halted settlement and pushed back those already settled near the river. Most settlement activity came from the east, where Lewisburg on the Greenbrier was a primary staging area. Early accounts indicate that settlement was limited to speculators and land prospectors until c.1795 and the conclusion of the Indian Wars. One source notes that the first settlement along the river was founded in 1791 at Kessler's Cross Lanes near Camden-on-Gauley (Webster County). Prior to that, c.1783-1795, there were large tracts of land granted to individuals but actual settlement was slow in coming.

There have been no large scale waves of growth in the Gauley River region which still retains its relatively primeval appearance. There were no wagon trails in 1818, and by 1870 only two buggies were recorded in the Nicholas County area. But despite this isolation, the Gauley River area was the scene of several Civil War engagements. This was primarily due to both sides' desire for control of the entire Kanawha valley and its salt deposits. In 1861 General William Rosecrans defeated General Floyd to keep the Carnifex Ferry-Kessler's Cross Lanes area in Union hands. The next year at Gauley Bridge, which was a Union supply depot, Loring defeated the Union general Lightburn. In this engagement, Gauley Bridge was destroyed for the second time. The first occurred during the defeat of General Wise by Rosecrans in July 1861. The Summersville area was visited by the Imboden-Jones Confederate raiding party in April and May, 1863, but the action was sporadic and not large scale.

A major economic activity in the region was and is logging. This enterprise, c.1840-1950, began on the lower Gauley and spread upstream. Timber products are still the major resource of the upper half of the river. The trade utilized the river for floating logs to mills such as Camden-on-Gauley. This industry also prompted railroad construction, such as the Chesapeake and Ohio line near Gauley Bridge (1873) and the Baltimore and Ohio (Pittsburgh and West Virginia RR) to Camden-on-Gauley (1892). From 1892-1905, nine private railroad companies operated for the transport of wood products. This activity subsided as the hills became largely denuded of timber. The forests have since grown back, to the extent that about three-fourths of the region retains its forest cover.

Except for some activity during the heyday of the logging industry, the area was generally operated on a subsistence economy. The original character of the land and the rivers, aside from secondary/tertiary forest cover, has changed little. Most of the coal mining activity in the Gauley basin during the past century has and still takes place to the north of the Gauley River and near Meadow River.

In general, the limited use of natural resources has contributed to the low population. Most small communities are agricultural and only a few towns of any size exist at all. These rely on the still viable coal or timber product trade. Water related recreation has become more important in the basin, particularly in the Cranberry River area, Summersville Lake, and the Lower Gauley.

Several sites have been included on the National Register of Historic Places. Many more potential sites, such as battlefields, mills, logging industry structures, and private dwellings await more complete investigation. Those sites listed in Fayette County are:

The Colonel George Imboden House (Contentment) in Ansted
 The Old Stone House (Tyree Stone Tavern) near Clifftop
 The Fayette County Courthouse in Fayetteville
 Halfway House (Tyree Tavern) in Ansted
 The Altamont Hotel in Fayetteville
 The Gauley Bridge Railroad Station in Gauley Bridge

Listed in Nicholas County is:

Carnifex Ferry State Park near Kesslers Cross Lanes

Sites on the State inventory identified for further study and possible nomination to the National Register include:

Glenn Farris Inn in Glenn Farris
 Glenn Farris Power Plant in Glenn Farris
 Swiss Charcoal Ovens in Swiss
 Rainelle United Methodist Church in Rainelle

Population - Five counties of the Gauley River watershed have a population of approximately 146,000, accounting for 7% of the States population. The population of this area increased 19% in the period between 1970 and 1980 and contains a density of 38 persons per square mile.

TABLE 2. POPULATION*

County	Population			Projected Population		Population Density (1980)	
	1970	1980	Change	1990	2000	Land Area (sq. mi)	Persons per sq. mi.
Fayette	49,332	57,863	+17%	66,000	75,000	663	87
Nicholas	22,552	28,126	+25%	34,000	39,000	642	44
Webster	9,809	12,245	+25%	15,000	17,500	551	22
Greenbrier	32,090	37,665	+17%	43,000	48,500	1,026	37
Pocahontas	8,870	9,919	+12%	11,000	12,000	943	10
Total or Average	122,653	145,818	+19%	169,000	192,000	3,825	38

Within the watershed there are five municipalities with more than one thousand inhabitants: Richwood (3,568); Summersville (2,972), Rainelle (1,983), Rupert (1,276), and Gauley Bridge (1,177). Communities within the river corridor of the Gauley include Jerryville, Bolair, Donaldson, Gauley Mills, Camden on Gauley, Allingdale, Woodbine, Marybill, Swiss, Jodie, Beach Glen, Belva, Alta, Brownsville, and Gauley Bridge; within the river corridor of the Meadow, Dawson, Rupert, Hines, Charmco, McRoss, Rainelle, Russellville, and Nallen. There are no communities along the Cranberry.

*Source: Bureau of Census, U.S. Department of Commerce, 1980 Census of Population and Housing, March 1981.

The Northeast megalopolis lies within three hundred miles to the northeast and the Pittsburgh-Cleveland complex lies within two hundred miles to the north. Within a 250-mile radius of the river area there are more than 30 million people.

Economy - The economy of the region is heavily dependent on its natural resources -- coal and timber. Most of the area has two to three seams of coal underneath and approximately 3,000 board feet per acre of timber growing on it.

Coal has been mined from nearly 1,000 acres of the study area. It is expected that as coal value increases, future coal production will accelerate. Mining employment has shown recent increases and now exceeds 6,000 in the study area.

Timber production can be expected to accelerate also. The present age of the existing timber plus the steep slopes found along the rivers makes logging a marginal economic operation in the study area. However, as present stands mature, volumes increase and log quality improves, the present status will change to a profitable operation. It is anticipated that by the year 2010 most of the area will again be ready for harvesting.

During the 1950-1980 period, West Virginia lost 4% of its population; the Gauley region, 11%. The employment/population ratio was lower than in the State as a whole. Mining employment accounts for a much greater proportion of total employment in the watershed (17%) than the State as a whole (9%), although its importance varies locally. Mining employment is mostly male; therefore, the proportion of female to total employment is low. Even though earnings are relatively high in the coal sector, purchases for producing coal are generally made outside the study area, thus effects on the local economy are limited.

In 1980, the percentage of income below poverty level in the region (14%) was higher than the State as a whole (12%), and the unemployment rate was 5 1/2% as compared to the State's 4 1/2%. Between 1950 and 1975, reported mining employment in the State fell by almost half, but in the region it fell by almost 70%. As a result, the region accounted for 15% of the State total in 1950, but for only 9% in 1975. In general, the greater the amount of mining employment in a county, the smaller the rate of economic growth.

The highest employment sector was government, accounting for 22% of the total. Manufacturing and mining had 17% each, services 16%, trade 15%, and other categories the remaining 13%.

Existing Public Use

Recreation - Outdoor recreation opportunities in the Gauley River region include whitewater boating, canoeing, fishing, hunting, picnicking, and hiking. Summersville Lake also provides boating and water skiing. There are approximately 538,877 acres of public recreation land. Approximately 90% of the recreation land is in Federal ownership, nearly 10% in State ownership, and a small remainder in local ownership.

Federal and State-Owned Recreation Facilities - The largest single holding in the region is Monongahela National Forest (851,846 acres). It contains eight other recreation areas and six special interest or wilderness areas, which include the Cranberry Back Country and the Cranberry Wilderness. A portion of the Back Country and additional adjacent lands were designated as Cranberry Wilderness in January 1983 by Public Law 97-466 and comprises 35,600 acres. The Cranberry Back Country is a black bear sanctuary but the hunting of deer, turkey, and grouse is permitted. Trout fishing is popular in the Cranberry River. Hiking trails and shelters are maintained. A limited amount of horseback riding, cross country skiing, and foraging is done. The Cranberry Glades Botanical Area (750 acres), which contains distinctive flora and fauna, receives fish and game management with the assistance of the West Virginia Department of Natural Resources. The U.S. Forest Service has selected several areas for the Roadless Area Review and Evaluation Project (RARE II); Cranberry and Laurel Fork North and Laurel Fork south have been designated wilderness, while Seneca Creek and Cheat Mountain have not.

The U.S. Army Corps of Engineers maintains Summersville Lake Recreation Area (9,346 acres) for the conservation of fish and wildlife, as well as for various recreational activities such as fishing, boating, water skiing, picnicking, camping, hiking, and sightseeing.

The State of West Virginia administers one historical park and three public hunting and fishing areas in the region (52,313 acres). Carnifex Ferry State Park, the site of a Civil War battle, maintains an interpretive museum, hiking trails, picnic areas, game courts, and a playground. At public hunting and fishing areas, fireplaces or grills and primitive or rustic campgrounds are provided.

The West Virginia Heritage Trust Program identified nine scenic areas in the basin. These sites consist of knobs, waterfalls, riverbanks, and rock formations. West Virginia Route 150, located along the eastern border of the Cranberry Wilderness Study Area, has been designated as a Scenic Highway.

Other Recreational Facilities and Activities - Local (county and municipal) recreational facilities account for 188 acres of recreation land. It includes parks, playgrounds, picnic areas, and community centers. Public outdoor recreation facilities in the region include fishing areas, swimming pools, and water sport areas with boat ramps. There are tennis courts, playgrounds and a golf course and six areas with hiking/foot trails. Overnight recreation facilities include numerous tent and trailer campsites, cabins, and a lodge. Rafting, kayaking, and canoeing activities can be enjoyed on most of the qualifying stretches. The upper Gauley offers boating opportunities for the beginner, the intermediate boater, and the expert. The stretch generally increases in difficulty as one proceeds downstream, ranging from easy to very difficult. It is best suited for boating in the springtime or after heavy rains.

The lower Gauley, however, is considered by expert kayakers and rafters to have white water that is virtually without equal in the East. The overall characteristics of the run have given it classic status. There are more than 100 rapids within this 25-mile stretch. Fifty-six of these rapids range from class III to class VI. Of these, at least four are class IV, three are between class IV and V, two are class V, two are between class V and class VI, and one rated as class VI. They range from difficult to very difficult and from extremely difficult to most difficult. Boating activity is controlled by Summersville Dam which currently provides the most suitable releases in the spring and autumn.

Cranberry River is an outstanding course with challenging whitewater in a wilderness setting. For nearly 27 miles, this small river drops 1,250 feet, an average of 47 feet per mile. Generally, it should only be run by experienced kayakers due to some extremely difficult white-water stretches. It is a popular cold water fishery with numerous aesthetic values. It is most suitable for boating in the springtime or after heavy rains.

Meadow River offers a broad spectrum of boating conditions. Paddlers encounter all the difficulties of the Gauley but in a condensed form. Less water is made up for by greater complexity and a wild, rugged corridor enhanced by interesting rock formations. The Meadow can be considered as three distinct parts. The upper stretch to Rainelle is gentle and leisurely and is bordered by woods and pastureland. From Rainelle to Russellville the river picks up, while the remaining part to its juncture with the Gauley River is considered to be the most exacting and difficult of the upper Ohio River basin tributaries,

LOWER GAULEY RIVER BOATING CONDITIONS

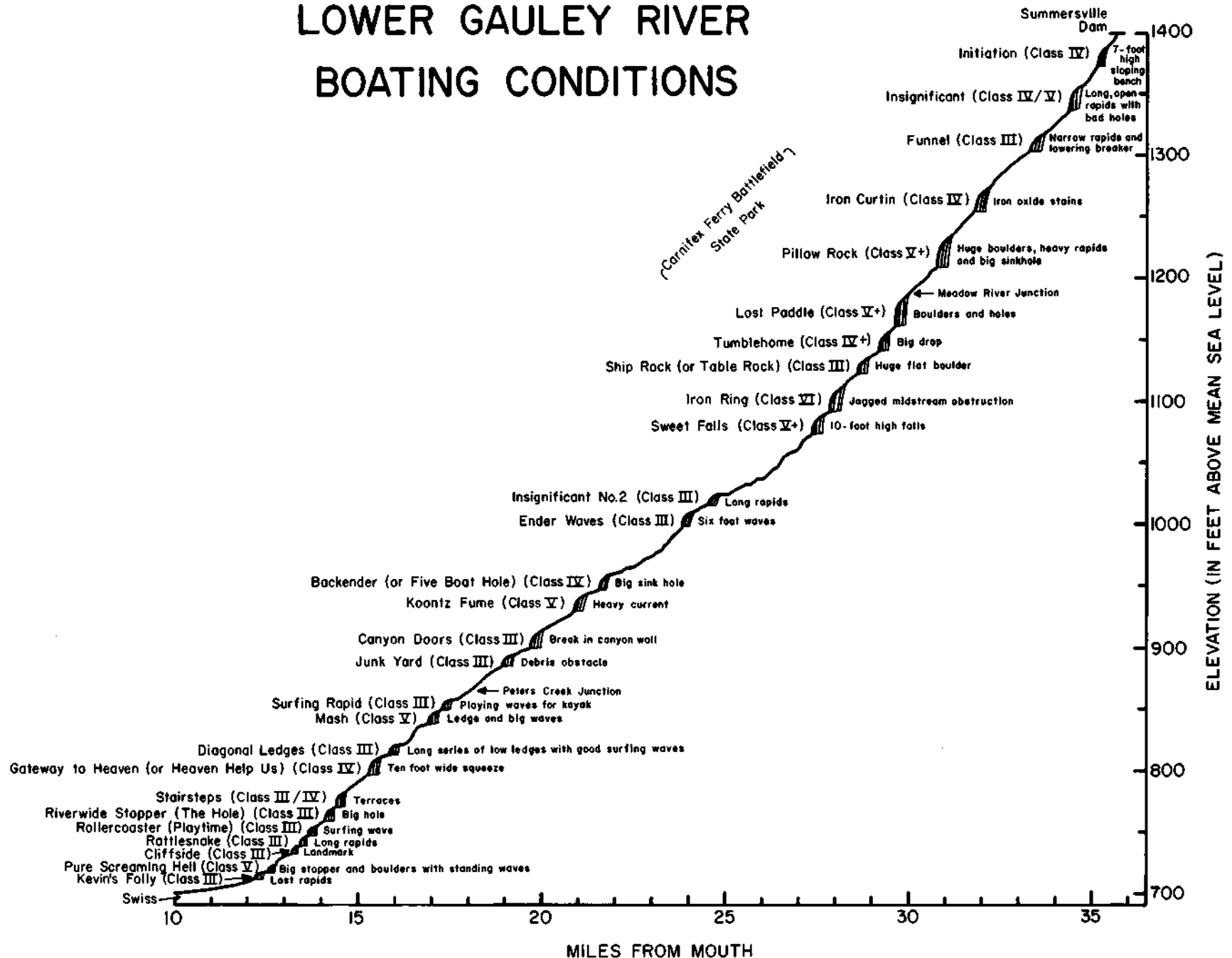


TABLE 3
BOATING CONDITIONS

SEGMENT OF RIVER	DISTANCE (MILES)	DROP (FEET)	GRADIENT/ (Ft/Mi)	DEGREE OF DIFFICULTY	TYPE OF CRAFT	EXPERIENCE NEEDED BY USERS
<u>Upper Gauley</u>						
Williams River Jct. to Big Ditch Run Jct.	6	106	18	Easy Medium Difficult	Canoe	Intermediate
Big Ditch Run Jct. to Knee Run Jct.	10	92	9	Easy	Canoe	Beginner
Knee Run Jct. to Cherry River Jct.	5	86	17	Easy Medium Difficult	Canoe	Intermediate
Cherry River Jct. to maximum Summersville Lake pool elevation	7	170	28	Medium Difficult Difficult Very Difficult	Kayak Raft	Expert
<u>Lower Gauley</u>						
Summersville Dam to Meadow River Jct.	5½	193	35	Difficult Very Difficult Extremely Difficult	Kayak Raft	Expert
Meadow River Jct. to Peters Creek Jct.	11½	306	27	Difficult Very Difficult Extremely Difficult Most Difficult	Kayak Raft	Expert
Peters Creek Jct. to Swiss	9	179	20	Medium Difficult Difficult Very Difficult Extremely Difficult	Kayak Raft	Expert
<u>Cranberry</u>						
Confluence of North & South Forks to Twin Branch Jct.	12	630	53	Difficult Very Difficult Extremely Difficult	Kayak	Expert
Twin Branch Jct. to Rich Hollow Run Jct.	3	66	22	Medium Difficult Difficult	Kayak	Intermediate
Rich Hollow Jct. to Woodbine Picnic Area	6	287	48	Difficult Very Difficult Extremely Difficult	Kayak	Expert
Woodbine Picnic Area to Gauley River Jct.	5	187	37	Medium Difficult Very Difficult Extremely Difficult	Kayak	Expert
<u>Meadow</u>						
Meadow Creek Jct. to Toms Creek Jct.	5½	87	16	Easy Medium Difficult	Canoe	Beginners
Toms Creek Jct. to below island group	5½	326	59	Difficult Very Difficult Extremely Difficult	Kayak	Expert
Below island group to Anglins Creek Jct.	8	108	14	Easy Medium Difficult Difficult	Kayak	Intermediate
Anglins Creek Jct. to U.S. Route 19 bridge	4½	233	52	Difficult Very Difficult Extremely Difficult Most Difficult	Kayak	Expert
U.S. Route 19 bridge to Gauley River Jct.	4½	430	96	Difficult Very Difficult Extremely Difficult Most Difficult	Kayak	Expert



Rafting and kayaking
the lower Gauley



with an endless array of difficulties. As is true for comparable free-flowing streams, the Meadow is most suitable for boating in spring and after heavy rains.

Fishing is good in all of the qualifying stretches. The Cranberry is a popular trout fishery.

Hunting is popular for both big and small game. Most of the black bear population in the State is in the eastern section of the basin. Squirrel, rabbit, and ruffed grouse are harvested in the area along with woodchuck, raccoon, woodcock, fox, and wild turkey.

Sightseeing and hiking opportunities are considerable, especially in the Cranberry Back Country.

Water Supply and Water Resources Development - Groundwater in the Gauley River Basin occurs in rocks of Mississippian and Pennsylvanian age and in alluvial sand and gravel of Quaternary age. The water-bearing rocks, or aquifers, generally yield groundwater of acceptable quality to satisfy the water needs of consumers in the basin. In general, the groundwater of the basin has a high iron content and low concentrations of chloride and dissolved solids. Some of the groundwater has been greatly affected locally by the underground mining of coal.

The upper Gauley, the entire Cranberry, and the entire Meadow Rivers are not affected by impoundments. The lower Gauley is regulated by Summersville Dam, located at mile 34.5 on the Gauley River, and constructed in 1966 as a unit in the comprehensive flood control plan for the Ohio River Basin. The dam is of rock-fill construction with an impervious central core, 390 feet high and 2,280 feet long. It controls a drainage area of 803 square miles. This 2,700-acre impoundment provides for recreation, flood control, low flow augmentation, and water supply to the surrounding area and the lower Kanawha River Basin. Average annual discharge from the reservoir has been 2,250 cubic feet per second (cfs) for the past nine years. Water temperatures at the outlet between November 1974 and September 1975 fluctuated between 33°F and 70°F.

Status of Land Ownership and Use

Land Use and Ownership - Land and water use are limited but varied due to the ruggedness of the area. Outdoor recreation activities such as hunting, fishing, whitewater boating, picnicking, hiking, sightseeing, and camping are popular activities. Industries such as surface and deep mining for coal and logging are important. Agriculture is limited mainly to grazing, hay production, and home gardening.

Much of the remaining land and water resources found in the Gauley basin reflect man's past uses and misuses. These impacts have been in the form of logging, mining, stream flow regulation, fire, trash dumping, and railroad and highway construction. However, the general inaccessibility and relatively rapid plant and animal succession have allowed these areas to recover to a near natural condition.

Today, 78% of the land in the Gauley region is undeveloped and 22% is developed. Of the developed land, 13% is agricultural, 6% recreational and cultural, and 3% commercial, mineral extraction, residential and industrial.

The current land use of the river corridor along the three rivers is as follows:

RIVER	FOREST	Percentage		
		WATER	STRIP MINED	OTHER*
Cranberry	97.1	1.6	0.0	1.3
Meadow	91.3	2.0	5.9	0.8
Gauley (Upper)	94.4	1.9	1.6	2.1
Gauley (Lower)	90.0	5.0	1.2	3.8

*Other includes land used for communities, roads, farming, etc.

Public ownership of land in the river area is primarily under the management of the U.S. Forest Service, U.S. Army Corps of Engineers, and the West Virginia Department of Natural Resources. The U.S. Forest Service manages the Monongahela National Forest which includes nearly 99% of the Cranberry River corridor and a portion of the upper Gauley River area. In some locations only the surface rights have been acquired, not the underlying minerals. Elsewhere full fee-simple surface and subsurface rights are in Federal ownership. A substantial part of the land within the authorized boundary of the National Forest is in private ownership.

The U.S. Army Corps of Engineers manages the Summersville Dam and Lake on the Gauley River. The Corps has taken ownership upstream on the Gauley to approximately 7,000 feet above where Big Beaver Creek enters the river. This ownership represents about 6% of the upper Gauley River area.

The State of West Virginia manages the Carnifex Ferry Battlefield State Park on the lower Gauley River. This ownership accounts for less than one percent of the lower Gauley river area.

Much of the private land ownership in the river areas consists of several large coal and lumber companies. Other large holdings are controlled by railroad, real estate, and farm interests. Individual family properties cover a much smaller land area.

Water Rights and Ownership - Under the West Virginia Constitution, Article XIII, ownership and control of the beds of navigable streams, such as the Gauley River, is by the State through the Public Land Corporation of West Virginia.

Sand, gravel, and coal lying between low watermarks on the bed of a navigable stream in West Virginia are considered minerals. The title to and the right to develop and exploit these minerals are vested in the Public Land Corporation of West Virginia which may license individuals or private corporations to extract them.

Transportation and Access to the River - Two major east-west highways and two major north-south highways traverse or lie within the immediate vicinity of the Gauley River. These are:

- U.S. Route 60 which crosses the Meadow River at Rainelle and the main stem at Gauley Bridge
- W.Va. Route 39 spans the Gauley near Summersville and parallels the lower reach
- U.S. Route 219 lies near its headwaters
- U.S. Route 19 spans Summersville Lake and Meadow River

Average daily traffic counts for major routes through the study area are as follows: U.S. Route 60, 7,000; U.S. Route 19, 5,000; W.Va. Route 20, 2,300 to 4,400; W.Va. 41, 3,800 to 2,600; and W.Va. 39, 2,500.

Of the 3,186 miles of highway in the basin 2,754 miles (72%) are local, 585 miles (15%) are collector, 301 miles (8%) are minor arterial, and 175 miles (5%) are principal arterial.

Secondary and unpaved roads reach or even parallel many stretches of the Gauley and Meadow Rivers. Much of the Cranberry River is paralleled by unpaved forest roads.

An extension of Interstate 64 is under construction and bridges the upper Meadow. A ramp is also under construction in the Dawson area.

Most of the upper and lower Gauley and lower Meadow are paralleled by railroad tracks of the Chessie System which are used primarily for the hauling of coal.

Charleston is the major transportation center for the region, providing long-distance access by air, bus and rail. Less frequent long distance bus connections can be made from Beckley and Summersville. Also, small airports are located near Beckley, Fayetteville, and Summersville. Amtrak service provides one train in each direction daily to New York or Chicago from White Sulfur Springs, Alderson, Hinton, Prince, Thurmond and Charleston.

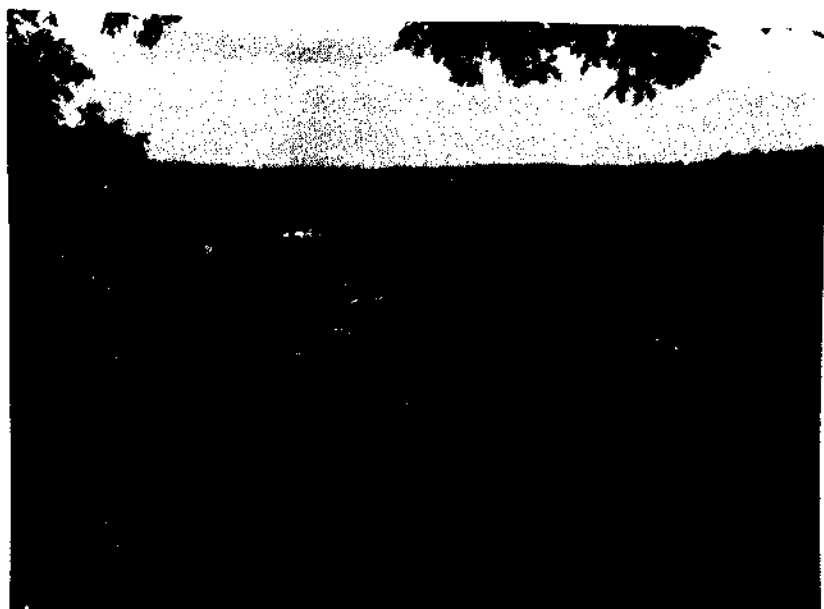




Maturing forest lands



Building foundation remnants near confluence of
Gauley and Meadow



Lower Gauley in vicinity of Carnifex State Park



Falls entering lower Gauley

V. A GUIDE FOR RIVER CORRIDOR PROTECTION

A. River Management Approaches

The lower Gauley is outstanding, with river values that merit strong protection, and needs a comprehensive plan with strong protective measures to assure flows, access and safety.

The Meadow, on the other hand, does not have prospects for, nor does it necessarily require a strong managing agency to protect the river values; existing State statutes may be sufficient. The lower Meadow, which has the most outstanding values, is least accessible and least threatened.

The Cranberry could be proposed for inclusion in the National System if the Secretary of Agriculture deemed it appropriate.

Some lands along the upper Gauley are being managed by the Forest Service. Roughly half the lands are owned outright or are within the proclamation boundary of the Monongahela National Forest. A similar determination of suitability by the Secretary of Agriculture would be necessary before proposing this segment in the National System.

The following management approaches discuss how one or more river corridor interests might work together to protect the values of all or portions of the eligible river corridors. These approaches are not mutually exclusive but can be combined and changed to provide the best possible management approach for each segment. They are presented to stimulate concepts on how to best plan and manage the river corridor. If requested, and subject to the limits of its resources, the National Park Service is willing to provide technical assistance for State/local river planning interests.

Public Agency - Administration would be exercised through a land managing agency at the local level. There could be an agreement whereby the counties could jointly adopt parallel regulations and land use protection controls, taking into account each jurisdiction's own development goals and needs, existing land use, and natural and scenic features deserving attention. This would create uniform standards for the preservation, management, development, and use of the river corridor. Where National Forest lands are involved, there would be a cooperative agreement with the U.S. Forest Service.

Interagency Authority - An intergovernmental organization, composed of a combination of concerned State or local agencies could be set up to manage the river. This could be a River Corridor Commission composed of representatives from the

counties, representative private landowners, local interest groups, the two regional planning and development councils, and the State of West Virginia.

The Commission would administer the corridor and be empowered to adopt, prepare and implement a river management plan; establish a planning and zoning commission; levy taxes and/or user fees; enter into contracts and agreements and accept all funds; acquire, dispose of and encumber real and personal property; participate in Federal/State loan and grant programs; operate and maintain areas and facilities to serve the purposes of the commission; appoint citizen advisory committees; control erosion and water pollution; approve, implement and enforce land use controls such as zoning and ordinances and subdivision regulations; and hire and retain employees and consultants.

Nonprofit Agency - A nonprofit management agency or similar organization would oversee and resolve problems or resource protection and development opportunities within the corridor and resolve conflicts. This could be a River Corridor Foundation, a nongovernmental, tax-exempt, nonprofit, private corporation organized and operated for the benefit of the general public. Generally a foundation is supported by donations, grants, gifts, loans, fund-raising efforts, and membership fees.

A foundation could offer permanent protection to selected areas along the river by accepting gifts of land or rights in land, offering tax benefits to those who donate land or rights in land, rendering technical assistance to landowners by helping them develop long-range plans for the conservation of part or all their property, accept gifts of land or rights in land, and then transfer them to a public managing agency, using gifts for matching purposes in obtaining grants, and setting up a revolving fund where the foundation purchases land, holds it for a time, and then sells it with certain restrictions.

Private Partnership - A compact between private interests in the river corridor would provide mutual notification of any resource protection or development actions. Concerned public officials would also be kept informed.

If there is enough interest, landowners and user groups could volunteer their time to clean up the river. Any selling of second-home lots could have covenants designed to ensure that future development will be environmentally compatible. Homeowner associations could police development activities. Existing associations could tighten their codes and new associations could be formed.

B. Preparation of a River Management Plan

Management Objectives

Under any of the above management approaches, a comprehensive management plan for the lower Gauley or any other eligible segments would be developed with specific objectives in mind. In order to take into consideration the outstandingly remarkable values which qualify the river for inclusion in the National System and the intent and purpose of the Wild and Scenic Rivers Act, the following objectives or goals for preservation, development, and use are suggested for the plan and its implementation:

1. To preserve the river and its immediate environment in its natural setting.
2. To preserve the free-flowing condition of the waters.
3. To maintain and upgrade water quality.
4. To provide high quality recreational opportunities for present and future generations.
5. To provide for a level of recreation use and distribution of use that minimizes deterioration of land and water resources and safeguards the rights of private landowners.
6. To assure the preservation of geologic features.
7. To maintain and enhance fish and wildlife resources.
8. To assure the effects of the management plan are in the interest of local residents.

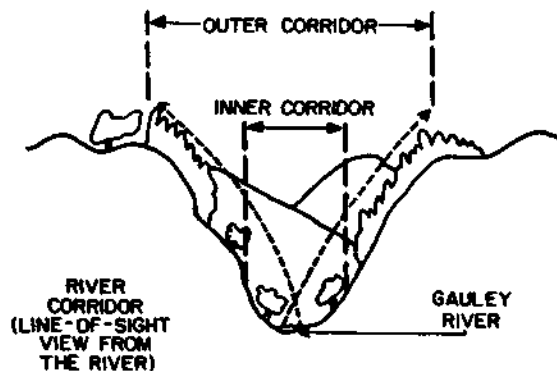
Establishing a River Corridor

A river corridor or visual corridor is determined by line-of-sight from the river, in the case of the Gauley, to the immediate ridge tops. It consists of land on either side of the river, the river itself, and any islands that require protection to preserve natural, scenic, cultural, and recreational values. Specific boundaries should be mapped to document the major jurisdictional area of the plan. Some problems outside of this corridor could be addressed in the management plan, but most of the management approaches should be focused within the boundaries.

The most common means of boundary delineation is inclusion of all land that can be seen from viewpoints on and along the river. Where topography and distance permit, this boundary may be formed by the ridge line, based on line-of-sight from and near the river. In those flat to gently sloping areas where the

line-of-sight is a great distance from the river, other boundary criteria should be considered, such as topography, jurisdictional or property lines, an approximately one-quarter mile setback from the river, and the inclusion of critical resource areas.

Within this boundary, an inner and outer corridor could be established. The inner corridor would encompass the river and adjacent lands that require a high degree of protection. This corridor could include the river, its banks, floodplain, unstable soils, and other lands critical to protection of its ecological function. Management strategies should prohibit new development; protect agricultural lands, forest lands, and other compatible land uses; and encourage the maintenance and enhancement of natural conditions. The outer corridor should prohibit visual intrusions and water, air, or noise pollution activities, protect and enhance agricultural lands, and provide visual and ecological guidelines for new development.



Inventory and Analysis of Critical Resource Values

The inventory is the "fact finding" stage of the management planning process, in which essential information regarding natural, scenic, cultural, and recreational resources is assembled. This information base should develop a clear picture of current river conditions, identify critical areas, and identify political actions affecting the river. The inventory should be conducted through careful study, mapping, fieldwork, and consultation with knowledgeable parties.

Critical areas are specific sites within the corridor requiring special attention and protection for their ecological, cultural, recreational, and economic values. Generally these critical areas include habitats of rare and endangered species, potential archeological sites, fragile ecological areas, potential sites of incompatible land uses, historical sites, public use areas, pollution sources, coal and timber resource areas, and areas of special interest.

Protection of the River Environment

Following the inventory the managing agency should prevent the destruction or deterioration of the river's critical resource values. Generally, the Gauley River and its immediate environment should be protected from recreational overuse, air and water pollution, incompatible land uses, excessive vehicular traffic, unacceptable noise levels, or other threats to environmental quality.

Efforts should be made to maintain only compatible land uses along the river. The good stewardship exercised in the past by private landowners suggests that voluntary efforts might continue to be an effective tool for protecting the river corridor's aesthetic appeal.

The State has laws and programs that provide some protection for the lower Gauley or other eligible river segments. It is unlawful to deposit any litter into or within 100 yards of a river or in a location where drainage conditions will cause any runoff of litter into a river. The Water Pollution Control Act authorizes the State to maintain and enforce reasonable standards of purity and quality of water consistent with public health and enjoyment and the propagation and protection of plant and animal life. The Division of Water Resources enforces a permit system to ensure that any development that discharges effluent into a river does not pollute the river above acceptable standards; water quality is monitored, and offenders are penalized according to the severity of their infraction.

The Cranberry flows totally within the Monongahela National Forest, where the river corridor is being managed for public, multi-use purposes. Protection of the river is accomplished at this time through the West Virginia Natural Streams Preservation Act, the Wilderness Act of 1964, and through existing management practices of the Forest Service on National Forest lands along the river.

The upper Gauley flows through lands partly administered by the U.S. Forest Service within the Monongahela National Forest boundary. Private and corporate inholdings do remain within the proclamation boundary however. The river values would be protected by the U.S. Forest Service on public lands within the National Forest.

Land Use Management

A land use management program should be designed to protect the land within the river corridor from activities that would alter its visual, ecological, and cultural values. Special attention should be given to maintaining natural conditions in the inner corridor, protecting critical areas from degradation, and preventing visual intrusions in the outer corridor. Management

strategies for critical areas should protect their special values, prohibit overuse and degradation of the environment, and provide guidelines to maintain and enhance their natural condition. In addition, strategies for solving problems should call upon State, regional, and local decision makers to coordinate their activities with respect to the ecological and cultural values of the river corridor.

There are several legal and administrative tools that could be incorporated in this program to effectively protect and guide land use activities in the river corridor. Many of these tools are described in the following section dealing with river preservation techniques.

Land in the corridor outside the National Forest boundary would normally be protected by land use controls, agreements with landowners, and other less-than-fee acquisition measures. Normally, there would be only two situations where it might be necessary for a managing agency to acquire real property: (1) where a specific parcel is threatened by development which would seriously threaten the river's special values and there is no other way to prevent development, and (2) where a specific parcel of land is needed for public access or use.

It is possible that there will be some areas along a river which cannot be protected from incompatible development through land use controls, agreements, or similar techniques. In such cases it may be necessary to acquire a scenic easement or full title to the land. A priority list for acquisition of lands or interests in lands may be desirable but there may be occasions when less critical parcels of land become available for acquisition. An evaluation would then be needed to determine to what extent, if any, a parcel would help protect the river corridor.

The West Virginia Code, Chapter 8, Article 24, provides the legal basis for county and municipal planning, as well as land use controls such as subdivision zoning ordinances and regulations. These measures, when enforced, could provide a large degree of control over incompatible development.

Another useful means for resource protection is a requirement that proposals for construction activity, logging operations, etc. that may have an adverse impact on soil resource, water quality, and ecological values within the river corridor have a sediment and erosion control plan (subject to the review and approval by qualified local Soil Conservation District officials) that would make provisions for the installation of Best Management Practices (BMP's) needed to adequately protect these resources. It could be carried out through local ordinances and land use regulations.

Visitor Use

Natural limitations on recreation use are imposed by the relatively narrow river and valley floor. Nevertheless, recreational experiences are possible for rafters, canoeists, kayakers, fishermen, hikers, sightseers swimmers, and others in a manner consistent with protection of the scenic values of the river. Therefore, the plan should call for securing appropriate, but limited areas of public use and access, but prevent the deterioration of natural resource values through overuse.

Raft and kayak use on the Gauley during the limited period of high water flows should be controlled by designation of access points to prevent trespass on private property.

Recreation management could also include educational efforts by the managing authority through instructional brochures and announcements of boating conditions by the local media.

Recreation facilities should be located with primary emphasis upon retention of existing environmental conditions at selected sites and should not disrupt the scenic values of the corridor. The local managing authority would establish a code of conduct for recreation use of the corridor and promote information on river conditions, safety equipment requirements, facilities, and the location of access points.

C. Implementation of a River Management Plan

1. River Preservation Techniques

There are a number of ways to protect the river's natural values while providing for residential, agricultural, and recreational uses. Methods selected will depend on the capabilities of local and/or State government; the natural, scenic, recreational, and cultural values of the river area; and the degree of impact of proposed development within the river area. It is suggested that a variety of the following preservation techniques could be implemented by individual owners, land trusts, foundations, and local and State government.

Land Trust

A land trust is a nongovernmental, nonprofit, tax-exempt, private corporation organized and operated for the benefit of the general public. A trust can purchase, manage, accept gifts, sale or lease of property. It is administered by private citizens whose interest in this instance would be river preservation. Generally a foundation is supported by donations, grants, gifts, loans, fund-raising efforts, and membership fees. The foundation could work closely with the counties, the State, the Nature Conservancy, and/or an established river commission.

Factors to be Considered - A land trust could offer permanent protection of selected areas along the river by performing the following functions: accept gifts of land (fee-simple) or rights in land; through the Internal Revenue Service and tax codes offer tax benefits to those who donate land or rights in land; render technical assistance to landowners by helping them develop long-range plans for the conservation of part or all of their property; accept gifts or land or rights in land, and then transfer them to a public managing agency (county or State government, river commission, etc.); use gifts for matching

purposes in obtaining grants; and set up a revolving fund whereby the foundation purchases land, holds it for a time, and then sells it to another party with certain restrictions, preferably at a profit. In addition, it can act quickly without red tape and can work effectively to coordinate complicated transactions. A land trust can help local landowners decide what types of land preservation would be most workable.

Easements

An easement is a limited or "less than fee" interest in property created by a conveyance. It can be acquired by purchase or donation. If one used the analogy that owning land is similar to holding a bundle of sticks, use of an easement would be setting aside or giving up some of the sticks. Easements do not affect basic ownership of the land -- the owner may sell or lease land with an easement at any time, subject to the terms of the easement. Depending upon the type of easement, no changes in right of access necessarily occur. Examples of easements are giving up the right to build structures taller than a given height or the right to put structures closer than a given distance to the water.

Factors to be Considered - An easement can be extremely flexible -- it may be written to particular specifications; reduce tax burdens; greatly increase the probability of long-term preservation of current use or preservation of open space; keep land under private control; and allow land to be sold, leased, or inherited and used in any manner consistent with the terms of the easement. Although an easement may restrict intense future development, it may also increase the marketability of the tract by preserving its natural and scenic values if adjacent tracts are also protected.

Donations

Types - An outright donation occurs when the owner gives the land in fee-simple to a nonprofit organization or governmental agency for its use. Easements can also be donated outright.

A donation by the execution of a standard deed with the reservation of life estate allows the owner or members of his or her family to occupy and use the property during their lifetime with possession passing to the nonprofit organization or governmental agency at a later date.

The owner can donate land, money, or other valuables to the organization in his will.

Factors to be Considered - Donation offers potential for preserving land in a desired condition, when a donor no longer has the individual means to do so. This can be a tool for realizing substantial tax benefits. However, restrictions on the donation can limit the extent of the tax benefits. Donations can reduce estate taxes and provide significant savings if they qualify for deductions from taxable income.

Bargain Sale of Land

A bargain sale combines the advantages of a gift and a sale. Because the land is sold in fee-simple at a reduced price, the difference between the fair market value and the actual selling price to a nonprofit organization or public agency represents a charitable contribution.

Factors to be Considered - A bargain sale may allow the seller to realize a charitable tax deduction in addition to a cash return. Like donations, bargain sales can reduce estate taxes and provide other tax benefits. Restrictions written in the transaction, however, can limit the extent of the tax benefits.

Zoning

Zoning is a method of controlling the use and development of land so as to yield the greatest benefits to the people in a community. Its aim is to protect the community from haphazard and careless development that may destroy land values. A variety of zoning techniques include traditional zoning, subdivision ordinances, trailer park zoning districts, cluster zoning, performance standards, special natural area districts, and scenic view districts.

Types - Trailer park regulations dealing with design criteria/minimum and maximum density requirements and encouraging innovative site layouts could encourage development that would be beneficial to property values and the general welfare.

River-edge setback requirements could be useful for reducing damage from flooding and storm water runoff, as well as for providing a buffer zone from development along the river's edge. These setbacks would also ensure a certain amount of open space.

Cluster zoning is a variation of traditional zoning regulations that assigns a fixed number of dwelling units per acre in a particular land use classification. Through clustering, the same number of units is maintained, but the standard lot and yard size are reduced and sometimes eliminated; this leads to placement of dwelling units in a way that will maximize open space. The resulting open space is generally owned and shared by the homeowners. One type of clustering is the farm colony concept, intended to keep land in farming while using some for residential purposes.

Performance standards are another way to guide land use activity in environmentally sensitive areas along the river's edge and throughout a jurisdiction or watershed. They permit existing land use activities to continue up to the point at which they interfere with or begin to inhibit the functions of the natural process. Development of performance standards requires selection of natural resource areas and description of their key functions related to the public health, safety, and welfare. This approach offers greater flexibility to the landowner or developer, as long as the standards are met.

Special natural area districts can be delineated in conjunction with established zoning to protect and conserve high-value natural lands such as wetlands, woodlands, floodplains, and old fields along the river edge. These districts could focus on a specific natural resource such as wetlands in a wetland conservancy district. The use of these areas can be regulated through ordinance, in addition to existing zoning, and can focus on the unique qualities and functions of that resource. Uses compatible with the functions of the special area could be permitted, and density transfers (see next section) would allow landowners to shift their development rights from the special resource area to a less environmentally sensitive part of their land.

Factors to be Considered - Zoning regulations are locally decided and administered, can be designed to meet local needs, and are widely known and used. However, they require consensus in development and establishment, can sometimes be rigid and inflexible, and can be used to promote undesired development if not properly administered. Zoning and subdivision regulations can be very useful in managing land along a river and provide a good basis for more complicated land management techniques.

Transfer of Development Rights

Transfer of development rights is based on the same idea as easements -- that landownership is a bundle of separable rights. Thus it is possible to separate development rights from any given parcel of land and apply them to another parcel of land. Under transfer regulations, the piece of land that has had its development rights transferred away will remain "undeveloped" while the piece receiving the development rights becomes eligible for higher density development than it would have been without those extra rights. This transfer is noted in the deeds to the respective parcels of land.

Factors to be Considered - A transfer of development rights offers the potential for preserving open space in desired areas while allowing higher density development in more suitable areas, thereby producing benefits for everyone -- the open space is protected, the landowner receives compensation for his loss of potential development, and the potential for expanded growth is allowed in another area. A transfer, however, is a rather complex concept to put into practice and requires strong public planning and zoning powers as well as a firm commitment by local officials to the objectives of the transaction. Also, a transfer may be more useful at a later stage of planning after some basic land management mechanisms are already functioning.

Agricultural District

An agricultural district, often a State-approved program, involves the creation of locally initiated districts designed to encourage agricultural operations and to discourage intensive nonfarm development, regulations hampering agriculture, and prohibitive taxation. It is designed to preserve and protect viable agricultural land by providing special tax relief to farmers. Agricultural districts are created in response to local initiative, whereby individual landowners who collectively own substantial acreage of agricultural land submit an application to the county legislative body for approval of the district.

Factors to be Considered - Usually, an agricultural district limits nuisance ordinances that affect the right to farm, keep property taxes low, limit special service tax assessments, and restrict public funds for nonfarm development. It must be locally initiated and supported and would require an initial enabling act by State legislature and time and effort to pursue through necessary steps. Agricultural districts could help preserve farmland in large sections by reducing development pressures.

Public Education and Information

Different methods such as the following, can facilitate intelligent land use and make alternative land use preservation techniques widely known to the public:

- More informative signing concerning littering, trail use, and identifying private lands;

- local land use workshops featuring topics that affect everyone;

- technical assistance consisting of advice to landowners about the value of natural, scenic, and/or cultural resources, and sound management and construction practices;

registration program leading to formal recognition of natural or historic landmarks to encourage voluntary protection;

cooperative agreements consisting of formal or informal contracts for cooperation in management, maintenance, or operation of valuable resources.

2. Coordination

One of the most important functions of the river area management plan would be to establish a means of coordinating planning and various regulatory activities.

The management authority would develop positions on such issues as bridge crossings, road access, road improvements, mineral extraction, gas exploration, timbering, and landowner rights.

If the State should have an interest in having any of the qualifying segments designated in the National System, local governments or groups may wish to assist the State in its management of the river and should be encouraged to do so. Management in the corridor outside of existing public lands would help to protect each qualifying segment and its immediate environment.

Environmental impact analyses would be prepared and reviewed to be certain that the direct and indirect impacts on the river environment are addressed, and appropriate mitigative measures are included.

D. Consideration for the National System

The State may at some future time decide to nominate the Cranberry River, a protected stream in the West Virginia Natural Streams Preservation System, and/or the eligible segments of the Gauley and Meadow Rivers for inclusion in the National Wild and Scenic Rivers System under Section 2(a)(ii) of Public Law 90-542. In order for a river to be added to the National System under State and/or local management, the following requirements should normally be met:

1. The outstandingly remarkable values which qualify the river for inclusion in the National System must be assured of permanent protection and management by or pursuant to State Statute. As a means to this end, the State must adopt a program of action which will provide permanent protection for the natural and cultural qualities of the river and adjoining lands.

2. Protective devices for the river corridor may include, but need not be limited to, fee acquisition, scenic easements or other than fee acquisition, zoning, limitations on building permits and other regulations. The intent is to provide for regulation of the uses of private lands immediately abutting or affecting the river to preclude changes in use which would substantially alter the character of the river corridor. The State must prohibit adverse impacts on the river resources by its own agencies and programs and through its permitting and licensing requirements. If local zoning will be a major tool, it must either be in place or expressions of local intent must be included in the application.

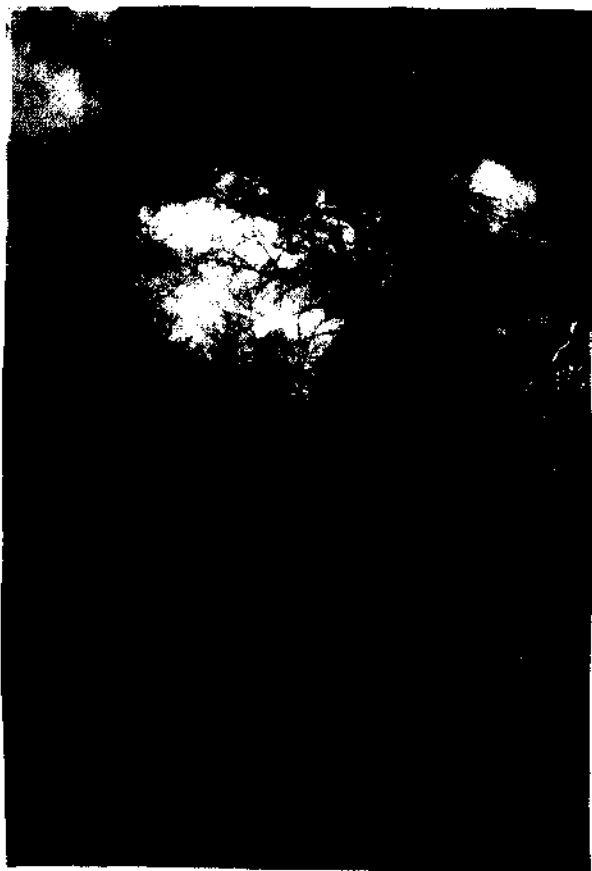
The procedures for designation are as follows:

1. The Governor of the State must make application to the Secretary of the Interior requesting that the river be added to the National System and documenting the actions taken to comply with requirements 1 and 2 above. The application shall indicate the extent of public involvement in the decision to protect the river. The application should include sufficient environmental data to permit the Secretary to assess the environmental impact of adding the river to the National System.
2. The Secretary's determination as to whether requirements 1 and 2 above have been adequately met would be based on:
 - a. An evaluation of the program of action prepared by the State and a field reconnaissance of the manner in which the State is implementing its program, or
 - b. If a Federal study has been completed, the extent to which the conceptual plan, as contained in that report, is being implemented.
3. The Secretary must determine that the river possesses outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values and that it qualifies for inclusion in the National System.
4. The Secretary must submit the proposal to the Secretaries of Agriculture and Army, the Chairman of the Federal Energy Regulatory Commission and the administrators of other affected Federal agencies for review and comment as required in Section 4(c) of the Act.
5. Finally, if the State's request is approved by the Secretary, the river would be added to the National System by publishing notice in the Federal Register.



Cranberry Glades Natural Area

Cranberry River at low flow



Meadow River Wetlands



Meadow River

VI. LIST OF STUDY PARTICIPANTS AND CONSULTANTS

A. Principals

David Kimball, Chief of Planning, National Park Service,
Mid-Atlantic Regional Office
Edward Hay, National Park Service, Mid-Atlantic Regional Office
William Bock, National Park Service, Mid-Atlantic Regional Office
Robert Schenck, National Park Service, Mid-Atlantic Regional
Office
Frank Pelurie, West Virginia Department of Natural Resources

B. Contributors

Federal Agencies

John Haubert, National Park Service, Washington Office
Jeff Chidlaw, National Park Service, Washington Office
Robert Gartner, National Park Service, Washington Office
Fred Bell, National Park Service, Washington Office
James Carrico, National Park Service, New River Gorge
National River
Anthony Conte, Regional Solicitor, Department of the Interior
William Cochran, Bureau of Mines
Gordon Leaf, Bureau of Mines
William Outerbridge, U.S. Geological Survey
Richard Watkins, U.S. Geological Survey
Chris Clower, Fish and Wildlife Service
William Tolin, Fish and Wildlife Service
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Gil Churchill, U.S. Forest Service, Monongahela National Forest
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I. Bernstein, Ohio River Basin Commission
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State Legislator

Senator Ralph Williams

Others

Chris Brown, American Rivers Conservation Council
Pat Munoz, American Rivers Conservation Council
Dave Conrad, Friends of the Earth
Hope Babcock, National Audubon Society
Walter Pomeroy, National Audubon Society
Laura Loomis, National Parks and Conservation Association
Don Weidemann, Citizens for Gauley River
Dave Brisell, Citizens for Gauley River
James Watkins, Izaak Walton League
Debbie Sease, Sierra Club
Charles Carlson, West Virginia Highlands Conservancy
Perry Bryant, West Virginia Citizen Action Group
Fred Ray, West Virginia Hills and Streams
Paul Brant, Mountain-Dominion RC&D
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Paul Breuer, Mountain River Tours
Jon Dragan, Wildwater Expeditions Unlimited
Thomas Dragan, New River Canyon Paddle and Raft Company
Michael Gray, Rivers Incorporated
Chris Johnson, North American River Runners
Barry O'Mahony, New River Adventures

Doug Proctor, Class VI River Runners
 Jeff Wartluff, West Virginia Wildwater Association
 Chad Winding, Wild Rivers Photo Service
 Doug Maddy, Fayette Plateau Chamber of Commerce
 E. J. Hodel, New River Travel Council
 E. F. Hays, Pocahontas Land Corporation
 James Price, NOAH Corporation
 Terry Iden, West Virginia Coal Association
 Bill Raney, WV Surface Mining and Reclamation Association
 William Keeney, Jr., Imperial Colliery Company
 Donald Gregory, Island Creek Coal Company
 Stephen Keen, Island Creek Coal Company
 Ernest Kincaid, Sewell Coal Company
 Danny Price, Sewell Coal Company
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 Roger Sherman, Mid Allegheny Corporation
 Andrew Zettle, Mid Allegheny Corporation
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 Daniel Bossart, Hamer Lumber Company
 Greg Hutson, Hamer Lumber Company
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 George Curtin, Pardee & Curtin Lumber Company
 Glenn Longacre, Pardee & Curtin Lumber Company
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C. Principal Cartographic and Clerical Support

Steve Kucheruk, National Park Service, Mid-Atlantic Regional
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 Janice Smith, National Park Service, Mid-Atlantic Regional Office
 Patricia Weldon, National Park Service, Mid-Atlantic Regional
 Office
 Joan Young, National Park Service, Mid-Atlantic Regional Office
 Bonnie Rogan, National Park Service, Mid-Atlantic Regional Office

D. Correspondence Received

The draft study report was available for public and agency review from March 24, 1983 to June 22, 1983. In addition to responses from the Governor of West Virginia, West Virginia Department of Natural Resources, West Virginia Geological and Economic Survey, the Secretary of the U.S. Department of Agriculture, Soil Conservation Service, Environmental Protection Agency, Federal Energy Regulatory Commission, and U.S. Army Corps of Engineers, comments have been received from four Interior Department agencies, eight conservation groups, two river outfitters, three coal interests, and seventeen individuals. The comments from the Governor, State agencies, and Federal agencies are included in this report.

Most respondents express support for National designation. The strongest support is for designation of the lower Gauley, mainly due to its premier whitewater in a setting of considerable natural beauty. Other comments are concerned with the threat of hydropower development and the preservation of the qualifying segments, including protection of wetlands near the headwaters of Meadow River for the benefit and enjoyment of future generations. There is some concern that the National Park Service was not projected as a viable management agency, but it appears that designation of any or all of the qualifying segments will be contingent upon local and State initiatives.

Designation is objected to by coal interests in the river corridor. Federal management is opposed by an interest group concerned about Federal intervention.

Most of the comments from Federal and State agencies contributed to updating the background material of the draft report.



STATE OF WEST VIRGINIA
OFFICE OF THE GOVERNOR
CHARLESTON 25305

May 31, 1983

JOHN D. ROCKEFELLER IV
GOVERNOR

Dear Mr. Arnett,

The State of West Virginia has completed its review of the draft Wild and Scenic River Study reports for the Gauley, Birch and Bluestone Rivers.

In general, we concur with the findings and believe that the river segments determined eligible would benefit by having Wild and Scenic River status. All have significant scenic, recreational, geologic and fish and wildlife values. It is felt that the National Wild and Scenic River concept would certainly assist the protection and management of the subject rivers and is a goal worth considering further. Therefore, in the future, should the people of West Virginia desire to support protection of some part of the rivers found to qualify, the state will initiate the appropriate action.

I have requested that our Department of Natural Resources submit specific comments to your Mid-Atlantic Region Office relative to each of the studies and these should be forthcoming in the near future.

The opportunity to review these studies is appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "John D. Rockefeller IV".

John D. Rockefeller IV

The Honorable G. Ray Arnett
Assistant Secretary for Fish and
Wildlife and Parks
United States Department of the Interior
Office of the Secretary
Washington, D. C. 20240



STATE OF WEST VIRGINIA
DEPARTMENT OF NATURAL RESOURCES
CHARLESTON 25305

JOHN D. ROCKEFELLER IV
Governor

May 26, 1983

DAVID C. CALLAGHAN
Director
MILLIS M. HERTIG, JR.
Deputy Director

Mr. James W. Coleman, Jr.
Regional Director
National Park Service
Mid-Atlantic Region
143 South Third Street
Philadelphia, Pennsylvania 19106

Dear Mr. Coleman:

The West Virginia Department of Natural Resources has reviewed the draft Wild and Scenic River studies for the Birch, Gauley and Bluestone rivers. This department supports the wild and scenic river concept and, in general, concurs with the findings of these studies. The establishment of river protection as embodied in the Wild and Scenic River Act is a goal worth considering further if in the future the State so desires to support protection of some segments of rivers found to qualify.

Comments relating to each of the individual studies are as follows.

Gauley River

The designation of the Gauley River as a wild and scenic river will enhance the recreational potential of the Carnifex Ferry Battlefield State Park. Conversely, the location of the park should be considered a positive factor in the final decision for the river receiving this designation.

It is a position of this department to encourage the protection of wetlands. The designation of the Gauley River as a Wild and Scenic river should include the protection of the large wetland area on the headwaters of the Meadow River.

The following are specific comments on the content of the document.

Page 21, Par. 5, Sent. 4 -- This inaccurate sentence indicates that the Gauley and Meadow Rivers are classified as acid-degraded streams. Although these basins have been mined extensively, acid mine drainage is not a significant problem.

Mr. James W. Coleman, Jr.

Page Two

May 26, 1983

Page 27, Par. 6 -- Fresh meadows, scrub swamps, etc. are wetland habitat types, not vegetation types.

Page 27, Par. 7 -- The three plant species referenced as being considered as federally endangered plants have been deleted from the list of petitioned species and are no longer under consideration by the Office of Edangered Species.

Page 28, Par. 1 -- The citation of goldenrod is nonspecific. A more exact common name should be used. Preferably, scientific names should be used for all species.

Page 28, Par. 2, Sent. 1 -- This sentence should be altered to read: "The lower main channel Gauley River supports a warmwater fishery...." This modification is necessary as there are native brook trout streams in the upper Gauley River.

Page 28, Par. 2, Sent. 7 -- "Perch" should be deleted from sentence as this species is rarely encountered in the drainage.

Page 28, Par. 2, Sent. 8 -- The Gauley River contains approximately 50 species of fish. Due to the number of species discussed here, it appears this review is restricted to the lake and lower Gauley River. However, it is unclear in the first part of this sentence whether the "21 species" were collected from either area.

Page 28, Par. 4 -- The first sentence should be altered to read, "Cranberry River offers a popular put-and-take coldwater fishery...."

Page 28, Par. 5 -- The finescaled saddle darter is not rare in West Virginia. However, this darter is unique and of special interest to the State since it is endemic to the New River (i.e., found only in West Virginia and a small portion of Virginia).

Page 29, Par. 4 -- This discussion is somewhat misleading. The eastern cougar (mentioned in paragraph 1 of this page, but not here), bald eagle, Kirtland's warbler and the Indiana bat should be discussed collectively or in a separate paragraph as they are all listed by the U. S. Department of the Interior as federally endangered species. Furthermore, the sentence regarding the Carolina parakeet should be deleted unless other extinct or extirpated species known from this area are discussed.

Birch River

This department concurs with the findings of the study that the 17.8 mile segment of Birch River has significant scenic and geologic values. Also, that including it in the National River System would best be done under local or state administration since the resources are chiefly of state/region importance. Since the Birch is a protected stream in the West Virginia Stream Preservation System, it already has some degree of protection and is not in

Mr. James W. Coleman, Jr.
Page Three
May 26, 1983

immediate danger of losing resource values. It is suggested that the National Park Service and the Department of Natural Resources continue working with local interests in pursuing further protection of this river for possible inclusion in the National System.

Specific comments on the document are:

Page 17, Par. 1 -- The Birch River is not stocked with trout. Thus, the first sentence should be altered to read, "The Birch River supports a good warmwater fishery."

Page 17, Par. 6 -- This sentence should be altered to read, "Federally endangered or threatened species which may occur in the study area include the bald eagle, Kirtland's warbler and the Indiana bat." No other species discussed in this paragraph should be expected.

Bluestone River

The draft report is generally complete and addresses the issue of scenic river designation for the Bluestone River objectively and thoroughly for the present. However, a follow-up study should be conducted within the next five to ten years soliciting more input from the general public since the public meetings and workshops were not well attended and representative of the state citizenry. The untimeliness of the study may have had a negative impact on the public interest shown since the study was made during the time when the New River Gorge area was being studied for management purposes by the National Park Service. This management study for the New River considered acquiring large areas of property as one option. Of course, the proposed acquisition of private properties arouses the negative concern of local citizens who have voiced their objections vociferously.

With regard to the different management concepts presented in the study for the river corridor protection, this department favors management by a public agency, preferably state, since approximately one-half of the eligible segment is currently under public control by the state.

No appreciable impact is to be expected in the foreseeable future on the three state parks and one state forest within the watershed - Pipestem, Bluestone, Pinnacle Rock State Parks and Camp Creek State Forest - by the exclusion of the Bluestone River from Scenic River classification. However, inclusion of the river as a scenic river area in the National Wild and Scenic River System would most certainly enhance and complement the scenic and recreational potential of Pipestem and Bluestone State Parks.

The following are specific comments on the study.

Page 20 -- White pine is not noted as an important part of the vegetative cover in the river corridor. White Pine (*Pinus strobus*) is common in both cover types mentioned - Northern hardwood forest found at higher elevations; Central hardwood forest at lower elevations.

Mr. James W. Coleman, Jr.
Page Four
May 26, 1983

Page 21, Par. 3, Sent. 5 -- According to West Virginia Department of Natural Resources, pickerel and northern pike have never been taken from the Bluestone Lake or River. This sentence should be altered to read, "Carp are also present."

Page 21, Par. 5, Sent. 3 -- This sentence should be deleted, as neither fish species are presently considered rare.

Page 22 -- No mention is made of woodland song birds in the section on bird species inhabiting the area. The river corridor is good habitat for a high number of wood warblers and other song birds which are a very important part of the ecosystem in the river corridor.

The opportunity to review and comment on these studies is appreciated.

Sincerely,



David C. Callaghan
Director

DCC/hgw/sas

cc: Division of Parks and Recreation
Division of Water Resources
Division of Wildlife Resources
U. S. Fish and Wildlife Service



WEST VIRGINIA
GEOLOGICAL AND ECONOMIC SURVEY

Robert B. Erwin, Director
and State Geologist

P. O. Box 879
Morgantown, WV 265070879
304/594-2331

Offices at Mont Chateau
Mont Chateau Road
Exit 10 (Cheney Lake) off U.S. 40

April 27, 1983

IN REPLY REFER TO:
00-EV/14110/8630

Mr. James W. Coleman, Jr.
U. S. Department of the Interior
National Park Service
143 South Third Street
Philadelphia, PA 19106

Dear Mr. Coleman:

Our comments on the Gauley, Bluestone, and Birch wild and scenic river studies are listed below:

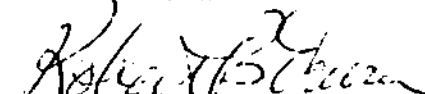
BIRCH RIVER, p. 14, 17: The prehistoric mound(s) in question are located on Diatter Run, more than two miles upstream from its junction with Birch River. Presence of the mound(s) would tend to indicate a Woodland Period occupation (1000 B.C.-A.C. 1000) rather than an Archaic (8000-1000 B.C.).

BLUESTONE RIVER: In addition to those mineral resources listed, some of the shale units within the Mauch Chunk Group are potential lightweight aggregate resources.

GAULEY RIVER: The draft report failed to list the sandstone conglomerates as aggregate, concrete sand and mortar sand resources and the shale units that are potential resources for building brick and lightweight aggregate.

The extraction and processing of the above listed resources would require volumes of water obtainable only from the rivers themselves. Would not the declaration of the Bluestone and Gauley Rivers prohibit water withdrawal for industrial use? Should this happen, the economic growth of the State and suitable housing development would be hampered.

Sincerely yours,



Robert B. Erwin

RBE:PL



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

May 5 1983

Honorable G. Ray Arnett
Assistant Secretary for Fish
and Wildlife and Parks
Department of the Interior
Washington, D.C. 20240

Dear Mr. Arnett:

Thank you for the opportunity to comment on your proposed report for the Gauley Wild and Scenic River, West Virginia. Our comments follow:

1. We agree with the Summary of Findings on page 1 that the Gauley is worthy of protection and management through local initiatives.

2. Document's reference to "proposed Cranberry Wilderness legislation" pages 2, 13, 21, 23, and 34. The President signed P.L. 97-456 on January 13 which in part designated the 35,600-acre Cranberry Wilderness.

3. Page 14, paragraph 4. The road paralleling the Cranberry River is closed to all public vehicular traffic, not just four-wheel drive vehicles.

4. Page 15. We recommend the following revision of paragraph 2.

"The entire Cranberry has extensive National Forest System lands in the river area. In addition, in January 1983, Congress designated a portion of the National Forest land along the Cranberry River as wilderness, thus giving added protection emphasis to the River. Inclusion in the National Wild and Scenic Rivers System would not offer more protection than results from present Forest Service management, and as a present component of the West Virginia Natural Streams Preservation System. The Forest Service expects to continue current management practices for the remaining portions of the Cranberry Backcountry and Cranberry Glades Botanical Areas and will implement wilderness protection and management for that portion of the lands designated along the Cranberry River. Therefore, it would be unnecessary for the Cranberry to be included in the National System at this time."

5. Page 21, paragraph 1. The Cranberry Glades were not proposed for wilderness. The backcountry and proposed wilderness had overlapping boundaries, but were not the same areas. The backcountry approximated 53,000 acres, of which 26,000 (of the 35,600 designated) have been designated wilderness. That portion of the backcountry not designated as wilderness will continue to receive special management considerations.

6. Page 23, paragraph 1. The Cranberry Wilderness will remain a Class II air quality area. However, the State has the option to redesignate it as a Class I area by Section 164(a) of the Clean Air Act, as amended August 1977.

7. Page 27, paragraph 6. Cranberry Glades was designated a Natural Area on December 1, 1965. It is 750 acres.

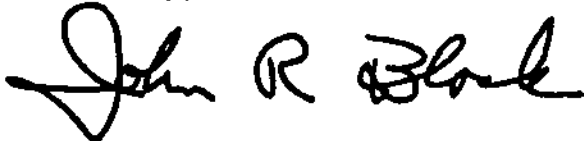
8. Page 34, paragraph 2. The Monongahela National Forest is 851,846 acres. The RARE II assessment for the Monongahela National Forest has been completed. Cranberry and Laurel Fork North and Laurel Fork South have been designated wildernesses; Seneca Creek and Cheat Mountain have not.

9. Page 48. Recommend paragraph 4 to read as follows:

"The Cranberry flows totally within the Monongahela National Forest, where the river corridor is being managed for public multi-use purposes. Protection of the River is accomplished at this time through the West Virginia Natural Streams Preservation Act, the Wilderness Act of 1964, and through existing management practices of the Forest Service on National Forest lands along the River."

If any questions arise about these comments, feel free to contact the Forest Service, Land Management Planning Staff, 382-8013.

Sincerely,

A handwritten signature in black ink, appearing to read "John R. Block". The signature is fluid and cursive, with the first name "John" being the most prominent.

John R. Block
Secretary



United States
Department of
Agriculture

Soil
Conservation
Service

State Office
75 High Street, Room 301
Morgantown, West Virginia 26505

May 13, 1983

James W. Coleman, Jr.
Regional Director
National Park Service
Mid-Atlantic Region
143 South Third Street
Philadelphia, Pennsylvania 19106

Dear Mr. Coleman:

Members of our staff have reviewed the draft reports on the Gauley and Birch Wild and Scenic River Studies. Comments and suggested changes in the soils sections of both reports are attached.

We appreciated the opportunity to review the documents. If we can be of further assistance, please advise.

Sincerely,


Rollin N. Swank
State Conservationist

Attachments



SUGGESTED CHANGES IN THE SOILS SECTION
GAULEY RIVER WILD AND SCENIC RIVER STUDY

Page 25

Paragraph 3

Lines 3 & 4: "Less well drained and deeper to" should be changed to "less well drained and generally deeper to"

Line 6: Fragile should be replaced with brittle

Paragraph 4

Lines 18 & 19: "uplands, and Pope, Philo, and Ernest soils on bottom lands and foot slopes" should be changed to uplands, Pope and Philo soils on bottom lands and Ernest soil on foot slopes.



United States
Department of
Agriculture

Soil
Conservation
Service

Soil Conservation Service
207 W. Maple Avenue
Fayetteville, WV 25840

March 31, 1983

Subject: L7423(MAR-PC) Review and Comments

To: James W. Coleman, Jr. Regional Director
National Park Service, Mid-Atlantic Region
143 South Third Street
Philadelphia, PA 19106

Thank you for the opportunity to review and comment on the draft reports of the Birch, Bluestone, and/or Gauley Wild and Scenic River Studies. These comments may also be applicable to the New River Gorge National River.

One idea that might be given some careful consideration under the "Land Use Management" program for the protection of the soil resources, water quality, and ecological value within the river corridors, is the requirement (through local ordinances and land use regulations) that all persons proposing any kind of construction activity, logging operation, etc., that may have an adverse impact on the above, prepare and submit a sediment and erosion control plan (subject to the review and approval by qualified local Soil Conservation District officials), that would make provisions for the installation of Best Management Practices (BMP's) needed to adequately protect these resources.

Sincerely,

William Harris

William Harris
District Conservationist
Fayetteville Field Office

cc:

Southern Soil Conservation District, Beckley, WV





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

APR 26 1983

Mr. James W. Coleman
Director
Mid-Atlantic Regional Office
National Park Service
US Department of Interior
Greene Building
6th and Arch Streets
Philadelphia, Pennsylvania 19106

Dear Mr. Coleman:

The staff of Region III, EPA has reviewed the Draft Wild and Scenic River Studies for the Gauley, Bluestone, and Birch Rivers in West Virginia. The comments appear below and we appreciate the opportunity to present them to you for your use in the decisions regarding the delegations.

All the studies mention mine drainage as a water quality problem with some areas more significant than others in terms of the water quality impacts. In areas where mining is currently going on, acid mine drainage should be under control and in compliance with the regulations covered by the NPDES permit in effect. Since the West Virginia Department of Natural Resources now administers the NPDES program, they should be contacted to assure that all active mines are in compliance.

However, the acid mine drainage problems often worsen after mining is completed and the mine is closed. The current state-of-the-art in reclamation leaves something to be desired in this regard and results are inconsistent in attempts to control the chemical reactions involved. The possibility exists that mine drainage will be a problem worthy of consideration into the future and this should be included in your deliberations.

Thank you for the opportunity to participate and review the studies. We have rated these documents LO-2 in EPA's Reference Category, which is attached for your information. If we can be of any further assistance, please contact Mr. Robert Davis of my staff at 215-597-4388.

Sincerely,

Henry P. Brubaker
Chief
Planning & Analysis Section

Enclosure

Definition of Codes for the General Nature of EPA Comments

Environmental Impact of the Action

LO--Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement or suggests only minor changes in the proposed action.

ER--Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to reassess these aspects.

EU--Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1--Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2--Insufficient information

EPA believes that the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3--Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the draft statement.

If a draft impact statement is assigned a Category 3, ordinarily no rating will be made of the project or action, since a basis does not generally exist on which to make such a determination.

FEDERAL ENERGY REGULATORY COMMISSION
NEW YORK REGIONAL OFFICE
26 FEDERAL PLAZA, ROOM 2207
NEW YORK, NEW YORK 10278

April 4, 1983

Mr. James W. Coleman, Jr.
United States Department of the Interior
National Park Service
Mid-Atlantic Region
143 South Third Street
Philadelphia, Pennsylvania 19106

Re: Draft Wild and Scenic River Study Reports
Bluestone, Gauley, and Birch Rivers - West Virginia

Dear Mr. Coleman:

This is in reply to your memorandum dated March 24, 1983 requesting our review of the draft reports for the referenced studies.

At the present time, the Commission has only one jurisdictional project near the proposed study areas. The City of Summersville, WV has filed a major license application for construction of a hydropower plant at the existing Corps of Engineers' Summersville Dam on the Gauley River. It is noted that Summersville Dam forms the upper boundary for the Lower Gauley River segment which your draft study proposes to classify as a wild river.

If you have any further questions or require additional information, please contact Mr. Anton Sidoti, Chief - West Branch at telephone number (212) 264-1161.

Sincerely,


James D. Heeson
Acting Regional Engineer



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310

9 MAY 1983

Honorable G. Ray Arnett
Assistant Secretary for Fish
and Wildlife and Parks
US Department of the Interior
Washington, D.C. 20240

Dear Mr. Arnett:

This is in further response to your letters of March 22, 1983, which transmitted for Department of the Army review and comment your proposed reports on wild and scenic river studies of the Birch, Eluostone and Gauley Rivers in West Virginia.

While your proposed reports conclude that portions of all three of these rivers and several of their tributaries meet the criteria for inclusion in the National Wild and Scenic Rivers System, public interest and support are not sufficient to consider them suitable for inclusion in the system at this time.

In view of the above, the Department of the Army interposes no objection to submission of these reports.

The opportunity to review these proposed reports is appreciated.

Sincerely,

W. E. Gianelli

William E. Gianelli
Assistant Secretary of the Army
(Civil Works)



APPENDICES

APPENDIX I.

Coal

The most extensive surface and underground mining, by coalbed, has been along the following reaches of the Gauley River:

<u>Reach</u>	<u>Coalbeds (topographic position)</u>	<u>Thickness (inches)</u>
Gauley Bridge upstream to Swiss	Eagle	66
	Powellton	60
	No. 2 Gas	60
	Coalburg(on ridgetops)	42
	Lower Kittanning(on ridgetops)	60
Swiss upstream to Summersville Dam	Sewell (near river level)	48
	Gilbert	48
Vicinity of Summersville north of Summersville Lake	Eagle	40
	No. 2 Gas	42
	Peerless	40
	Coalburg	40
	Lower Kittanning (ridgetops)	48
	Upper Kittanning (ridgetops)	36
Head of lake upstream to confluence with Williams River	Sewell (near river level)	48
Williams River confluence upstream to vicinity of Miller Ridge	Fire Creek (near river level)	60
	Beckley	48
	Sewell	48
	Eagle	40
	Peerless	36
Miller Ridge to Randolph-Pocahontas County line	Sewell (near river level)	48
Gauley River headwaters Pocahontas County	Sewell	48
	Hughes Ferry	36
	Gilbert	36
	Eagle (ridgetops)	36

Thicknesses shown represent an average for the given reach and may vary considerably. In the past half century, most of these coalbeds have been mined.

Coals along the Gauley River corridor belong to the New River, Kanawha, and basal Allegheny groups. The more important coalbeds, in ascending order, and their average thickness along the Gauley River are:

<u>Coalbed</u>	<u>Thickness (inches)</u>
Fire Creek	30
Beckley	36
Welch	40
Sewell	40
Hughes Ferry (Iaeger)	24
Gilbert	30
Little Eagle	24
Eagle	48
Powelton	24
No. 2 Gas	36
Peerless	36
Cedar Grove	24
Coalburg	36
Stockton (Lower Mercer)	30
Clarion	36
No. 5 Block (Lower Kittanning)	54
Middle Kittanning	40
Upper Kittanning	36

Coalbed names from the Williams River confluence upstream to the headwaters are not accurate because of recent changes in correlations.

Several coalbeds are known to exist along the Cranberry River corridor, however, little is known regarding their quality and thickness. By county, coalbeds present and representative thicknesses are:

<u>County</u>	<u>Coalbed</u>	<u>Thickness (inches)</u>
Pocahontas	Sewell	29
	Gilbert	63
	Gilbert A	26(one locality)
Webster	Fire Creek	22 - 42

The Sewell, Iaeger (Hughes Ferry), and Gilbert coals may also be present in Webster County.

Nicholas	Fire Creek	45
	Sewell	15 - 38

The Castle, Lower Iaeger, and Iaeger (Hughes Ferry) coals may also be present in Nicholas County.

Based on available information, no production has been recorded on mining of these coalbeds along the Cranberry River corridor.

The Meadow River and its upper tributaries originate in and flow through Mississippian age rocks of the Mauch Chunk series. Discontinuous areas of early Pennsylvanian age strata cap higher elevations in upper Meadow River drainages. Northwest of Rainelle, the river flows in the Pottsville Group of Pennsylvanian age until its confluence with the Gauley River at Carnifex Ferry.

Coal is the mineral resource of greatest importance along the visual corridor of the Meadow River. Ten coalbeds occur in minable thickness and continuity along the river. They are, in ascending stratigraphic order and average regional thickness:

<u>Coalbed</u>	<u>Thickness (inches)</u>
No. 3 Pocahontas	24
Nos. 4 or 5 Pocahontas*	20
No. 6 Pocahontas	35
No. 7 Pocahontas	32
Little Fire Creek	16
Fire Creek	39
Beckley	31
Little Raleigh	36
Sewell	36
Sewell A	30
Gilbert	36

* correlation questionable

The Sewell coalbed has been mined extensively in the Meadow River watershed by both surface and underground techniques. Its outcrop trace encircles ridge crests in the headwaters and dips northwestward, dropping beneath river level at a point downstream from Russellville, Fayette County. Seventeen mines within the Meadow River basin reported production from the Sewell coalbed in 1977 (latest available production figures). Two mines also reported production from Sewell riders, the Sewell A and Sewell B.

Several minable coalbeds usually occur beneath the Sewell and have production reported from them between 1971 and 1977. They are: the Little Raleigh, Beckley, and Fire Creek coalbeds of the New River group and the Nos. 3 and 6 Pocahontas of the Pocahontas group. Outcrops of these beds are usually found beneath the Sewell except in the vicinity of Russellville where these lower coalbeds are below stream level.

The Gilbert coalbed was the only coal in the Kanawha group from which production was reported between 1971 and 1977. Mining from the Gilbert bed was limited to ridge crests in the New Haven District of Fayette County.

Clay, Shale and Limestone

The Gauley River from Bolair to Gauley Bridge flows in valleys formed in strata of the New River and Kanawha groups. Clay and shale samples from these groups in Nicholas and Webster Counties have average alumina concentrations of 26 percent, which may qualify them for consideration as future sources of aluminum.

No analyses are recorded for clays and shales from Fayette County. However, six samples from Nicholas County were collected and tested by the West Virginia Geological and Economic Survey for firing and bloating properties. Four samples were found suitable for use as face brick mixtures and two qualified as sources of lightweight aggregate.

In Webster County, two shale samples were analyzed from the Kanawha group. One was found to be usable in face brick mixtures and the other was unacceptable for any application. Neither qualified as high-alumina clays.

Upstream from Bolair, the Gauley River streambed is in rocks of the Mauch Chunk group. Two shale samples from the Mauch Chunk were also collected by the West Virginia Geological and Economic Survey and found to be unsuitable for structural clay products. However, they contained over 26 percent alumina and may be a potential source for aluminum.

Although these clays and shales are located along lines of transportation, there is not sufficient demand to warrant extraction and shipment to existing processing facilities or investment for the construction of new, local facilities.

Sandstones of the New River and Kanawha groups have long been used as dimension stone for local needs. The availability of rail transportation along the Gauley River could provide a market for those sandstones which meet the varied requirements of different types of dimension stone. Sandstones of this area have great variety in their properties and sources could conceivably be found which could fulfill many dimension stone requirements.

New River group sandstones have been sampled by the West Virginia Geological and Economic Survey in Nicholas and Fayette Counties to determine their suitability for use as high-silica sands. A sample of the Upper Raleigh sandstone qualified for use in the manufacture of sixth, seventh, eighth, and ninth quality glass. Two samples from the Lower Nuttall and Upper Raleigh sandstones, in Nicholas County, were both suitable for use as eighth and ninth quality glass sand. Because these sandstones may have narrow grain-size distributions, weathered outcrops could provide material useful as industrial sands.

The Hinton limestone occurs along the river in Webster County and may be suitable for road base and concrete aggregate.

The Greenbrier limestone is an important mineral commodity in Pocahontas County, where there are currently three limestone quarries in operation.

Sandstone was once quarried for local use in Nicholas and Pocahontas Counties, but because similar material is abundant regionally, future utilization is unlikely except on a limited basis.

Similarly, sand and gravel resources present along the main stem of Cranberry River tributaries are abundant elsewhere and will not be affected by Wild and Scenic designation.

The Pottsville series includes sandstones, clays, and shales. Historically, Pottsville sandstones have been used as dimension stone for local use. Weathered portions of these sandstones can sometimes be used as a source of high-silica sand. A private company retains an option on two tracts of land in the Wilderness District of Nicholas County for extraction of high-silica sands. Clays and shales have been sampled by the West Virginia Geological and Economic Survey within the region and found to be suitable for structural clay products. However, due to the widespread abundance of similar and better supplies, there is no market at this time.

The Mauch Chunk series is represented by red to green sandstones, siltstones, and shales with lenticular limestones, and thin, impure coals. The Droop sandstone of the Mauch Chunk series has been quarried near Alderson, Greenbrier County, for use as dimension stone and industrial sand. Analyses of samples from these quarries qualify these sands for use in the manufacture of sixth, seventh, eighth, and ninth quality glass. Mauch Chunk clays and shales are suitable for use as structural clay products. However, like the clays and shales of the Pottsville series, there is no market. Mauch Chunk limestones are not of economic importance because of the local abundance of Greenbrier limestones which are capable of supplying any foreseeable need. Coals of the Mauch Chunk series are too thin, discontinuous, and impure to be considered as a resource.

Oil and Gas

As stated in the text there is high potential for oil and gas production in the lower Gauley River. Upstream from Summersville, oil and gas potential drops. Some drilling was completed in the Beaver District of Nicholas County in 1977, but all attempts ended in dry holes. Some gas production has been reported from a field at Cowen, Webster County, which might indicate that some potential for gas exists along the river in this area.

No production or exploration is reported for the headwaters region of the Gauley River.

Available literature suggests that there is only slight potential for gas accumulations and virtually no potential for oil accumulations along the Cranberry River corridor.

There is some oil and gas potential for the Meadow River area, although it is not located within a known field. One well drilled in the Williamsburg District of Greenbrier County in 1977 was dry.

WATER QUALITY DATA, GAULEY RIVER (including Cranberry and Meadow Rivers)

Location	pH		Acidity (mg/l)		Alkalinity (mg/l)		Conductivity (mi/cm ³)		D.O. (mg/l)		Total Coliform (MF/MENDO/100ml)		Fecal Coliform (MF/M-FCBB/100ml)		Turbidity (JTU)	
	Range	Ave	Range	Ave	Range	Ave	Range	Ave	Range	Ave	Range	Ave	Range	Ave	Range	Ave
<u>Gauley River</u>																
Jerryville	5.3-6.4	6.1	0-5	2	4-8	5	25-60	45								
Williams River Jct.	4.4-6.7	5.9	3-17	7	0-29	7	25-84	44							5-10	4
Craigsville	6.1-8.2	6.8	0-5	1	4-18	8	20-260	62	18-15	14			13-120	62		
Maryhill	5.3-8.6	6.8			4-12	8	9-245	58	7-11	9					0-8	3
Summersville Dam	6.4-7.4	6.9		5		3	40-65	55	10-14	12						
Meadow River Jct.	5.1-7.5	6.6			1-17	8	17-80	46	8-12	10					1-7	3
Jodie	6.2-7.7	6.8	1-11	3	3-25	11	35-94	59	8-14	11		707		99	1-70	14
<u>Cranberry River</u>																
Jct. N&S Fms.	3.6-5.1	4.4	0-10	3	1-5	3	22-50	32								
Tumbling Rock Run	4.8-6.8	5.6	3-21	7	1-6	3	21-47	31								65
Cranberry Campground	7.2-7.8	7.5					143-151	147							5-7	6
Woodbine Picnic Area	7.5-8.0	7.7					232-242	237							13-14	14
<u>Meadow River</u>																
Rupert	6.3-7.4	6.8	4-5	5	5-20	12	45-62	53	7-11	9	100-8500	3475	10-110	80	17-27	23
Rainelle	7.0-7.5	7.3	3-6	4	9-25	15	55-60	58	9-12	10	100-3200	1400	10-200	103	0-2	1
Hallen	6.7-7.1	6.9	2-4	3	3-26	12	53-118	77	8-12	10	100-22,000	5239	100-2900	546	2-80	12
Mt. Lookout	6.5-7.1	6.8		5		4	50-190	85	10-14	12						

	Arsenic (mg/l)	Barium (mg/l)	Cadmium (mg/l)	Chlorides (mg/l)	Chromium (mg/l)	Cyanide (mg/l)	Fluoride (mg/l)	Lead (mg/l)	Phenols (mg/l)	Selenium (mg/l)	Silver (mg/l)
<u>Gauley River</u>											
Jerryville	0			0-1 0.5	10					0	
Williams River Jct.				1-2 1							
Craigsville	0			1-4 2	10	0-.01 .004	10				0-0 0
Maryhill			50-100 54	1-9 3	50-50 50			50-50 50			50-50 50
Summersville Dam (below)				2-2 2							
Meadow River Jct.	5		50-100 53	0-27 3	50-50 50			50-50 50		5	50-50 50
<u>Cranberry River</u>											
N&S Forks Jct.	0			0-1 0.6	10			10		0	
Tumbling Rock Run Jct.		50		0-1 0.9	10			5-25 10			
Cranberry Campground	20	770-950 860	5-5 5	0-1 0.9	10-10 10					5	
<u>Meadow River</u>											
Rupert									1-2 1		
Rainelle	3-4 4		2-2 2	3-6 5	1-1 1	1-1 1	0.1-0.1 0.1	20-22 21		1	2-2 2
Hallen	2-6 3	40-90 50	1-18 4	1-10 5	1-4 2		0.0-0.2 0.1		1-37 4	1-4 2	2-8 4
Mt. Lookout	5		50	2	50	.001-.004 .001		50		5	

Source: STORET Data, U.S. Environmental Protection Agency (1965 + 1967-79)

WEST VIRGINIA WATER QUALITY CRITERIA FOR THE GAULEY RIVER

<u>Parameter</u>	<u>Standard</u>
Ammonia, un-ionized	≤ 50 ug/l
Arsenic	≤ 50 ug/l
Barium	≤ 1.0 mg/l
Cadmium, soluble	≤ 0.8 ug/l (hardness 0-35 mg/l CaCO ₃) ≤ 2.0 ug/l (hardness 36-75 mg/l CaCO ₃) ≤ 5.0 ug/l (hardness 76-150 mg/l CaCO ₃) ≤ 10.0 ug/l (hardness >151 mg/l CaCO ₃)
Chloride	≤ 100 mg/l
Chromium, hexavalent	≤ 50 ug/l
Copper	≤ 5 ug/l (hardness 0-50 mg/l CaCO ₃) ≤ 10 ug/l (hardness 51-80 mg/l CaCO ₃) ≤ 15 ug/l (hardness 81-120 mg/l CaCO ₃) ≤ 20 ug/l (hardness 121-160 mg/l CaCO ₃) ≤ 25 ug/l (hardness 161-200 mg/l CaCO ₃) ≤ 50 ug/l (hardness 201-260 mg/l CaCO ₃) ≤ 60 ug/l (hardness 261-280 mg/l CaCO ₃) ≤ 75 ug/l (hardness 281-300 mg/l CaCO ₃) ≤ 85 ug/l (hardness 301-320 mg/l CaCO ₃) ≤ 115 ug/l (hardness 321-340 mg/l CaCO ₃) ≤ 145 ug/l (hardness ≥ 341 mg/l CaCO ₃)
Cyanide	≤ 5.0 ug/l
Dissolved Oxygen	≤ 5.0 mg/l
Fecal Coliform	≤ 200 organisms/100ml, 30-day geometric mean ≤ 400 organisms/100ml, in 90% of sample over 30 days
Fluoride	≤ 1.0 mg/l
Iron (total)	≤ 1.0 mg/l
Lead	≤ 25 ug/l (hardness 0-100mg/l CaCO ₃) ≤ 50 ug/l (hardness >101 mg/l CaCO ₃)
Manganese	≤ 1.0 mg/l
Mercury	≤ 0.2 ug/l unfiltered (≤ 0.5 ug/l body burden)
Nitrate	≤ 10 mg/l
Nitrite	≤ 1.0 mg/l

Organics:	Chlordane	≤.01 ug/l (1.0 ug/l fish burden)
	DDT	≤.001 ug/l (0.1 ug/l fish burden)
	Aldrin-Dieldrin	≤.003 ug/l (0.3 ug/l fish burden)
	Endrin	≤.004 ug/l (0.3 ug/l fish burden)
	Toxaphene	≤.005 ug/l (1.0 ug/l fish burden)
	PBC	≤.001 ug/l (2.0 ug/l fish burden)
	Methoxychlor	≤.03 ug/l
PH		6-9 ph units
Phenolic materials		≤5 ug/l
Radioactivity		≤1,000 pci/l gross beta activity ≤ 10 pci/l dissolved strontium-90 ≤ 3 pci/l dissolved alpha emitters
Selenium		≤10 ug/l
Silver		≤2 ug/l (hardness 0-50 mg/l CaCO3) ≤4 ug/l (hardness 51-100 mg/l CaCO3) ≤12 ug/l (hardness 101-200 mg/l CaCO3) ≤24 ug/l (hardness >200 mg/l CaCO3)
Temperature		≤5°F rise above natural ambient ≤81°F May-November ≤73° F December-April
Threshold Odor		≤8 at 104°F daily average
Total Residual Chloride		≤10 ug/l
Turbidity		Site specific basis
Zinc		≤40 ug/l (hardness 0- 50 mg/l CaCO3) ≤75 ug/l (hardness 51- 80 mg/l CaCO3) ≤90 ug/l (hardness 81-120 mg/l CaCO3) ≤110 ug/l (hardness 121-160 mg/l CaCO3) ≤130 ug/l (hardness 161-200 mg/l CaCO3) ≤150 ug/l (hardness 201-240 mg/l CaCO3) ≤175 ug/l (hardness 241-280 mg/l CaCO3) ≤225 ug/l (hardness 281-300 mg/l CaCO3) ≤275 ug/l (hardness 301-320 mg/l CaCO3) ≤325 ug/l (hardness 321-340 mg/l CaCO3) ≤375 ug/l (hardness 341-400 mg/l CaCO3) ≤600 ug/l (hardness >401 mg/l CaCO3)

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43, 57, and 77

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