

Section E

Environmental Impact Assessment

This section of the report examines the environmental impacts associated with recreation in the Upper Youghiogheny River Corridor. The assessment draws upon previous research on the ecological impacts of river recreation, field observations along the river, and visitor and landowner perceptions of resource impacts to evaluate the extent of impact along the river and suggest management strategies for mitigating existing impacts.

Analysis of Existing Literature

Previous studies of the environmental impacts associated with river recreation provide a good baseline for understanding the impacts of recreation on the Upper Youghiogheny. Most previous studies have focused on measuring various types of impacts at concentrated use areas like put-in and take-out points, campsites, lunch stops and other attraction areas. Little research has been directed at determining how much of the total area in a given location has been adversely impacted by recreational use.

Most existing relevant studies have measured certain environmental characteristics at selected recreation sites and compared results with similar measures taken at undisturbed control areas. These studies have documented changes in vegetation density and composition, soil compaction, erosion, and other indicators.

Settergren (1977) suggested that the impacts of recreation on shoreline vegetation can include: reduction in the native ground cover in terms of both amount and number of species present, mechanical injury to trees, elimination of trees in younger age classes, decline in tree vigor associated with soil compaction and root dieback, and a shift in species composition toward exotic and recreation-tolerant species. Impacts on soil typically include compaction which, coupled with loss of ground cover, can lead to sheet erosion, elimination of the upper layers of the soil profile, root exposure, and reduction in infiltration, hydraulic conductivity, soil organic matter, and soil moisture content and availability (Settergren 1977).

Littering is one of the most common forms of impact resulting from river recreation. In the Grand Canyon, Aitchison et al. (1977) found that litter was associated with higher densities of certain flies and ants at campsites which in turn caused an increase in certain species of vertebrates including birds and mammals. Studies of three National Park rivers in the eastern United States (the Upper Delaware Scenic and Recreational River, the Delaware Water Gap National Recreation Area, and the New River Gorge National River) found that litter was common at recreation use areas (Cole and Marion 1987a, 1987b; Marion and Cole 1987).

Improper disposal of human waste is another potential resource impact associated with recreation on remote rivers where sanitary facilities are typically not available. This type of impact can have serious effects on water quality and can present a serious human health hazard (Aitchison et al. 1977). Human waste can also become unacceptable from an aesthetic standpoint.

Water quality is a major concern, but apparently not a prevalent form of impact in wildland recreation areas (Hammit and Cole 1987). There is conflicting evidence regarding the effects of recreation on water

quality and coliform bacteria. Studies of bacterial contamination have more often found no effect of backcountry recreation on coliform bacteria concentrations; in cases where bacterial contamination was found it was more likely to result from other causes such as wildlife (Hammit and Cole 1987).

Suspended matter and turbidity may be the most important water quality parameters, both ecologically and in the eyes of recreationists. Anderson et al. (1976) found that 80% of the deterioration in water quality was due to suspended solids and their effects on light penetration, photosynthesis, and fish feeding and reproduction. Turbidity impacts are associated primarily with certain multiple use land management practices and some recreation-caused erosion. Impacts of recreation may result from erosion of ORV and hiking trails or from shoreline activities that are heavily concentrated in time and space. However, gravel roads, logging trails, and cutting practices in multiple use areas are probably a bigger contributor of watershed impacts than recreation (Hammit and Cole 1987). Neither Hansen (1975) nor Sutton (1976) could attribute streambank erosion simply to canoe traffic; in both cases the erosion observed was linked to some non-floating activity.

Studies have consistently shown that recreation impacts are not directly related to the amount of recreational use an area receives. The greatest amount of soil compaction and loss of vegetation typically occurs immediately following the opening of an area to recreation; there is relatively little change in impact with increasing use (Settergren 1977; Kuss et al. 1989). Aitchison et al. (1977), for example, found no correlation between amount of impact and number of users. Large and small groups produced the same impact, suggesting that it may be necessary to modify visitor behavior, rather than limit the total numbers of users, in order to alleviate environmental degradation.

Some of the more in depth studies of environmental impacts resulting from river recreation have been conducted on eastern rivers during the past few years. The Gauley River study (Boteler 1985) examined ecological impacts at five put-in and take-out locations along the river. The study focused on the extent of vegetative change and the presence of unique or rare plant species, and made observations on sanitary facilities, litter, erosion and other ecological factors. Results showed that the density of plant species was much lower at the access sites than at undisturbed control areas and transition areas between the recreation sites and control plots. Direct negative impact on the vegetation by whitewater users was found at one of the five access points. All of this impact was attributed to overnight use of this study area. Litter was remarkably absent in the five study areas and the litter that was found looked "old" and therefore probably was not left by recent whitewater boaters. Erosion was observed on the access roads leading to three of the study areas. Sanitation was considered a potential problem because several pit toilets were located in the sandy floodplain within 50 feet of the river, creating the potential for coliform contamination.

In spite of the impacts that were found, the general conclusion of the study was that "whitewater users in Gauley River Canyon are apparently having very limited impact on the ecological carrying capacity" (Boteler 1985: 158). Observed changes in the vegetation were attributed to recreation use pre-dating whitewater boating on the river. Introduced species were a significant factor at only one site. Rare and unique plants were present

the full length of the floodplain and should receive consideration if additional access points are established. The greatest negative ecological impact was felt to occur from overnight camping sanitation, eating and lodging facilities which were either lacking or failed to meet minimum environmental and health requirements.

Cole and Marion (1987a, 1987b) have recently completed detailed ecological studies of recreation sites at three river areas within the Mid-Atlantic region of the National Park Service. By replicating procedures used previously in other western and mid-western areas on all three study areas, the authors were able to compare results between the three rivers as well as with areas studied elsewhere.

The study of ecological impacts at the New River Gorge in West Virginia (Cole and Marion 1987b) focused on two questions: (1) how much and what types of impact have occurred on recreation sites along the river, and (2) how do these impacts vary with type of use? Relative to the first question, most impact indicators measured showed substantial differences between recreation sites and corresponding control areas. For example, 94 percent of the ground cover at recreation sites was lost, resulting in exposure of mineral soil, rocks and tree roots. The composition of vegetation at the recreation sites was very different from that at the control areas, reflecting a reduction in species richness at the recreation sites. Ninety-two percent of tree reproduction was eliminated at the recreation sites studied. Litter, human waste, and tree damage were prevalent. Recreation sites at the New River were generally more impacted than those studied at the Delaware River, and also were larger and exhibited more severe loss of vegetation than other backcountry sites examined in the west and midwest.

The second question in the New River study involved comparing sites used primarily by commercial rafting day-use parties with those used primarily by local fishermen who often stay overnight. Results showed that the outfitter sites were larger, with greater loss of vegetation, while the fishing sites tended to have more trash and litter. The larger size of the outfitter sites was attributed to the large size of rafting parties using the areas, while the quantity of trash at the fishing sites apparently resulted from the lack of an anti-littering norm among local fishermen and campers.

Study results also suggested that impacts to the soil were more strongly influenced by annual flooding than by recreational use of the river. In addition, the authors suggested that gaining access to the fishing sites over land probably causes more environmental impacts than use of the sites themselves. The study concluded that high levels of impact can be expected wherever use occurs along the shoreline. Therefore, management should attempt to concentrate use on as few sites as possible to prevent further increases in environmental impact.

The concurrent study of ecological impacts along the Upper Delaware Scenic and Recreational River (Marion and Cole 1987) had similar objectives and results, but also considered the relationship between the amount of impact and amount of use occurring on the sites studied. As in the case of the New River, all but two of the impact indicators measured differed significantly between recreation sites and control areas. Sites along the Upper Delaware, however, were considered only moderately impacted compared with recreation sites studied elsewhere. Frequently used sites (40-70 nights per year) were more highly impacted than infrequently

used sites (3-10 nights per year), but the difference in amount of impact between high and low use sites was small compared with the difference in the amount of use the sites receive.

Implications of the Upper Delaware study for management are unclear because most of the lands along the river are privately owned and thus most of the camping and associated impact involves trespassing on private land. The authors suggest that the highest priority for recreation management should be to develop a low impact educational program aimed at reducing unnecessary impacts of trash, exposed human waste, and damaged trees.

Cole and Marion's (1987a) study of the Delaware Water Gap National Recreation Area was very similar in both objectives and results to their study of the Upper Delaware. Sites studied at the Delaware Water Gap tended to be more impacted than those at the Upper Delaware, but less impacted than those on the New River. The implications for management differed, however, because most of the shoreline at the Delaware Water Gap is under the jurisdiction of the National Park Service. The authors concluded that campsite impact problems are not severe and management programs currently in effect at the Delaware Water Gap are effective. In particular, the data on the relationship between amount of impact and amount of use support the policy of restricting camping to designated sites as a means of preventing the spread of impact problems along the river.

Summary

The impacts of recreation on river environments are complex and not fully understood. Riparian areas impacted by recreational activities generally are small or insignificant compared to the total resource area in question. Impacts of recreation also are often small in relation to impacts from other disturbances and natural forces such as annual flooding.

Recreation impacts generally are found only at shoreline areas where use is concentrated, such as access points, popular stopping points, and campsites. Non-motorized boating generally produces no significant impacts on water quality or shoreline areas other than those used by boaters. Overnight use areas typically show the greatest amount of environmental impacts.

The amount of impact is *not* directly tied to the amount of use a given area receives. The extent of impact depends more on such factors as type of use, type of environment and site management. For example, soil compaction generally occurs only on finer textured soils; the gravel and sandbar soils found at stopover points on many rivers can be virtually indestructible. On the Current River in Missouri, free access of vehicles to the water's edge led to serious erosion problems that were preventable through site management and design (Settergren 1977).

In short, while environmental impacts have been documented at concentrated use areas on many rivers, these impacts generally have not posed a limiting factor to recreational use of the rivers. None of the studies cited above included recommendations to limit the *number* of people using the river. Studies typically have recommended restrictions on certain activities at specified locations, alterations in site design and management, and educational programs aimed at influencing visitor behavior so as to reduce their impacts on the environment.

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Non-source pollution impacts have not been addressed in this discussion. Some pollution from the use of agricultural fertilizers and chemicals may wash into the Youghiogheny from riparian lands and from feeder streams draining more remote areas. Additionally, some impact from livestock (e.g. vegetation browsing, trampling, and manure) may occur in the river corridor. The extent to which these potential sources of pollution affect the Youghiogheny River is unknown. These potential types of impact are worth noting, however, since increases in agricultural uses of the land could induce significant impacts.

Field Observations on the Upper Youghiogheny

Because of the general understanding of river recreation impacts available from previous studies and the unique characteristics of the Upper Youghiogheny River, only limited field observations were made in the current study. Relevant features of the Upper Youghiogheny include the following:

- 1) There are few access points to the river. Most boaters put in the river at Sang Run and take out at Friendsville. Some fishermen and rafters gain access at Hoyes Run. The only other access point available to the public is at Swallow Falls State Park.
- 2) There are few if any stopping places along the whitewater segment between Sang Run and Friendsville. Stopping during the trip is generally limited to brief stops to observe downstream rapids. Such stops may involve some boaters getting out of their boats, but they will generally only get on rocks to gain a better vantage point, which causes no shoreline impact.
- 3) None of the access points on the Upper Yough are used for overnight camping or food preparation, two activities that tend to produce the greatest impacts on other wild river areas. (These activities do take place in designated areas at Swallow Falls State Park, but these sites are designed for such use and have not been impacted like the more remotely located sites on other rivers).
- 4) The number of people using the Upper Youghiogheny is small, several orders of magnitude smaller than user numbers on most other whitewater rivers.

The upshot of these characteristics is that the environmental impact of recreation on the Upper Yough is exceptionally low, even when compared with other wild and remote rivers in the surrounding area, such as the Gauley and the New River Gorge in West Virginia. On the other hand, some impacts are evident at the river access points and it is important to assess ways of mitigating these impacts and preventing further impacts from occurring.

Impacts at Sang Run

Youghiogheny River boaters gain access at one of four locations near the Sang Run bridge. Three of these are private properties used by commercial outfitters for a fee. The put-in point directly adjacent to the Sang Run bridge shows some loss of vegetation due to the vehicular and foot traffic it receives (Figure E-1). The area impacted and extent of vegetation lost are quite small compared to many access points on other whitewater rivers. The most significant impact on this site is the loss of vegetation and soil erosion occurring



Figure E-1. Several outfitters launch trips from this access point adjacent to the Sang Run bridge

on the relatively steep river bank. These impacts are exacerbated by the launching of boats and slipping and sliding of people using the bank to reach the boats (Figure E-2). On the other hand, the impacted area consists of roughly fifteen feet of shoreline directly adjacent to a bridge that might also be viewed as a visual impact in the river corridor. The severity of this impact is in the eye of the beholder since, from a purely ecological standpoint, the impact on the overall environment is insignificant.

A second access point very similar to the first is located just upstream from the Sang Run bridge. The two areas are separated by some brush and trees so they are visually distinct from each other. They are comparable in size and description. The upstream location shows a visual impact of vehicular trampling, especially during wet periods, as illustrated in Figure E-3. The river bank is steep and eroded as in the case of the access area next to the bridge. In this case, however, the bank is barely visible from the road (as shown in the bottom photo of Figure E-3, which was taken from the Sang Run bridge).

The third put-in point used by commercial outfitters is located on the other side of the river in the yard of a permanent residence (Figure E-4). This site provides a more gradual slope to the river, which makes boat launching easier and reduces impacts to the soil and vegetation. This site shows no adverse impacts from boat launching.

The final river access point at Sang Run is the Natural Lands Trust (NLT) property located upstream from the bridge. Under the conditions established by the NLT, this site has been used for no charge by private boaters; commercial outfitters have not been permitted to use the site. (Negotiations are currently underway between NLT and the state of Maryland for purchase of this property by the state. If this transaction is completed, use of the site will still be limited to private boaters because of a deed restriction prohibiting commercial boat launching.) The property includes a relatively flat access point to the river and a large cleared area used for parking of cars. The parking area is screened from the river by trees and brush and thus is not visible from the river. The most noticeable impact at this area is the trampling and rutting left by vehicles in the cleared area, which is worse under wet conditions. Like the other access points, there is no site development to protect the site from resource impacts.

Impacts at Friendsville

Whitewater boaters also take out at a limited number of locations in the town of Friendsville. The area beneath the Highway 48 bridge is used by many private boaters and a few commercial outfitters (Figure E-5). The river bank in this area has experienced some erosion due to foot and boat traffic up and down the relatively steep bank. Again, this impact is more important from a visual standpoint than an ecological one.

Most commercial rafting parties take out behind the bar next to the bridge in the town of Friendsville (Figure E-6), or on the other side of the river at the headquarters of Precision Rafting. Impacts at these sites are minor and confined to a very small area located on private property.

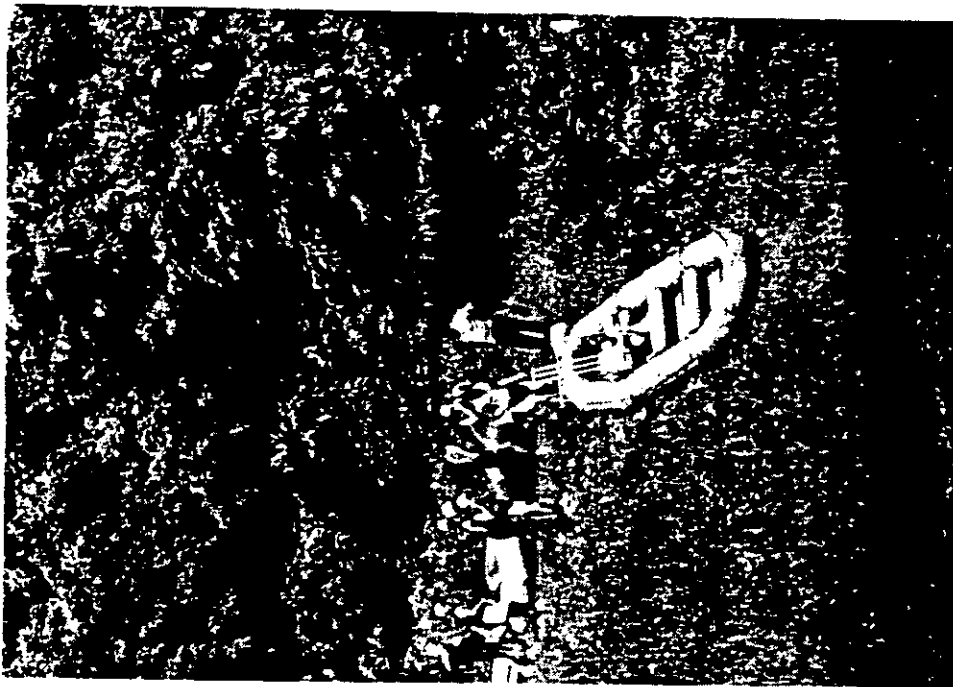
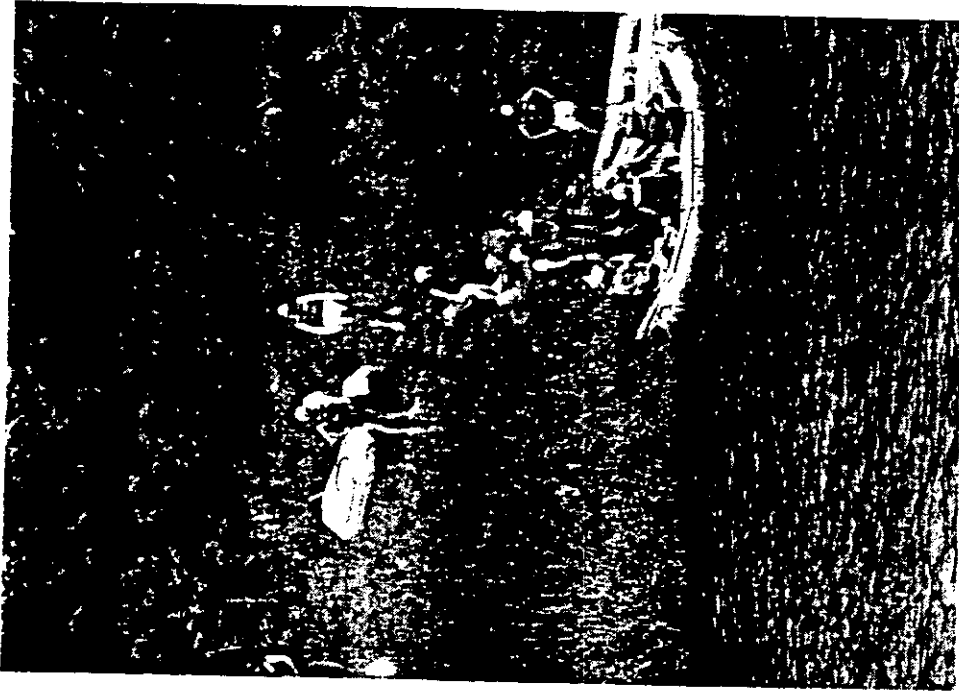


Figure E-2. Soil erosion is accelerated at the put-in next to the Sang Run bridge because of the steep river bank.

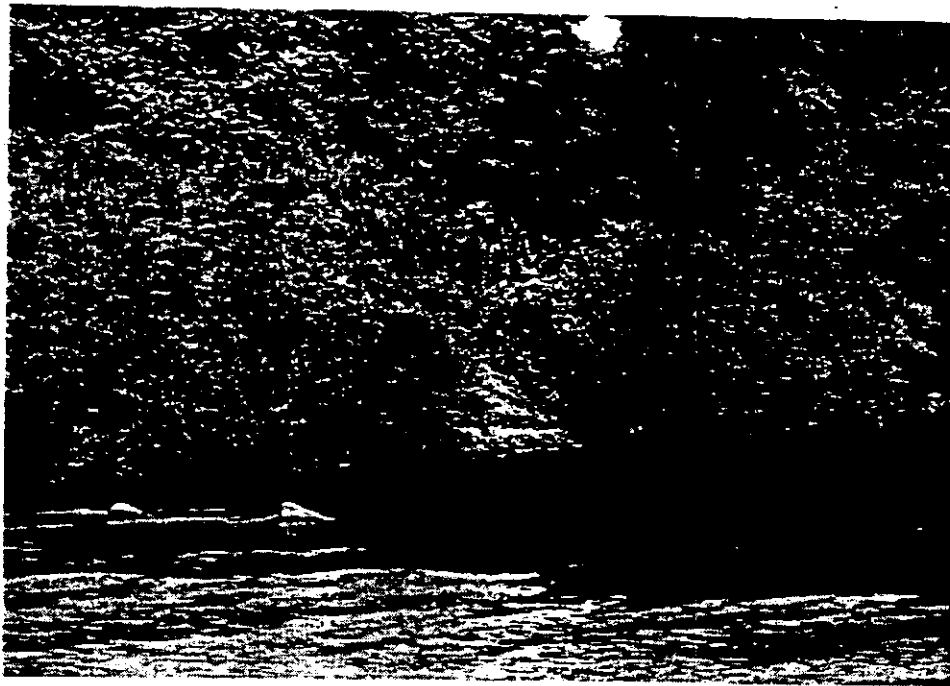


Figure E-3. Some outfitters use this access point just upstream from the Sang Run bridge; characteristics of this site are similar to those at the put-in next to the bridge .

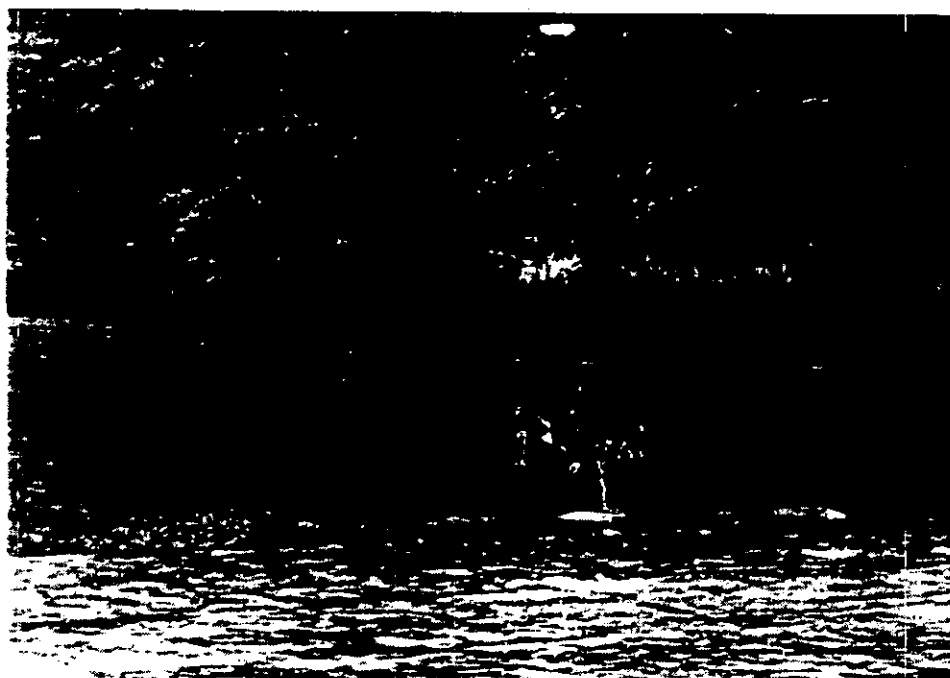


Figure E-4. Some outfitters use this property across the river and just below the Sang Run bridge to launch their trips; this put-in point is more suitable for boat launchings than the other sites at Sang Run.

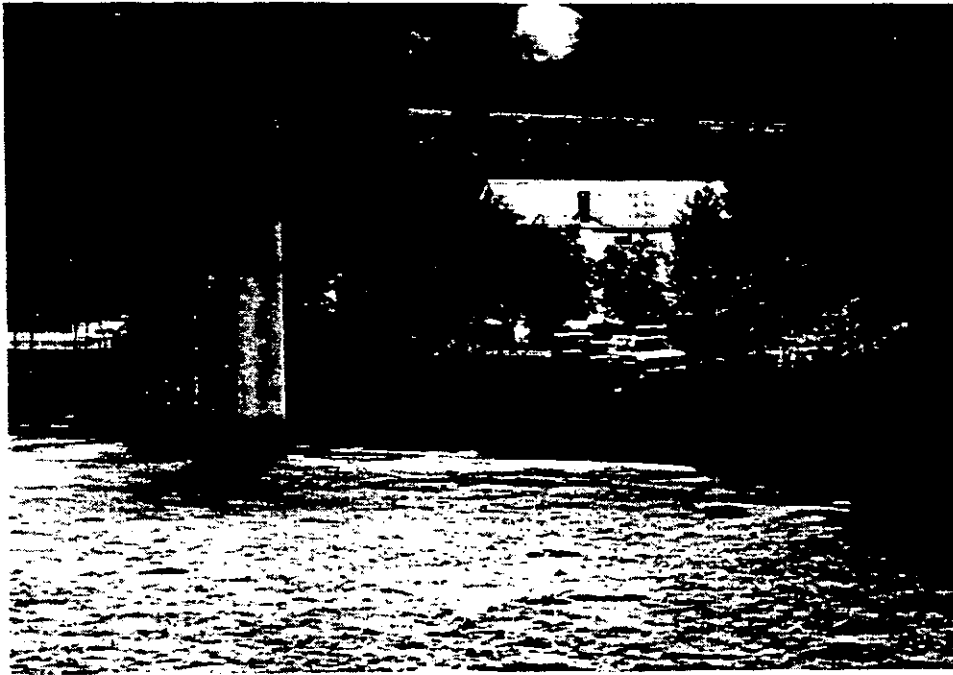


Figure E-5. This take out point beneath the HWY 48 bridge is used by many kayakers and some of the commercial outfitters

Impacts at Hoyes Run

Environmental impacts could occur at the Hoyes Run area, although the area does not appear to be significantly impacted at the present time. Anglers access the river through private property, as do some commercial rafting parties. Impacts similar to those found at the commercial raft put-ins at Sang Run may occur at this area if use of the area increases. The potential for significant impact is remote, however, since the site used is relatively flat, is without vehicle access, is on private property, and is lightly used.

Impacts at Swallow Falls State Park

Swallow Falls State Park is a point along the river where recreational use is concentrated and where environmental impacts may occur. Conversations with Park Superintendent Riley (1989) and observations

made by the investigators found significant trampling impacts in the trail area adjacent to Muddy Creek and the Youghiogheny River. Extensive vegetation loss and erosion were noted and are acknowledged management problems. The damage occurs from visitors wishing to use the river for swimming, fishing, and sightseeing at the two falls. Park management is addressing these problems and planning measures to mitigate them. Site hardening and use limitations are among the measures under consideration (Riley 1989).

Summary

The environmental impacts of recreation on the Upper Youghiogheny are confined to a small number of access points and are very minor when compared to the overall river corridor or recreation use areas on other wild and remote rivers. Most of the impacts that do exist are a result of using less than optimal locations for access points and lack of site management and development to protect the areas from impact. Many of these minor impact problems can be mitigated through site management, as described in the recommendations at the end of this section. Some of these problems may be unavoidable since the areas in question are located on private land.



Figure E-6. Most commercial rafting parties take out at this location near the bridge in Friendsville or directly across the river at the Precision Rafting headquarters.

Perceptions of Environmental Impacts

The surveys employed in this study of both whitewater boaters and landowners asked respondents to indicate the extent to which they felt a listing of potential resource impacts were a problem on the Upper Youghiogheny. The list of items included impacts that might result from boaters using the river, such as litter, trampled vegetation and human waste, as well as impacts resulting from other land uses, such as logging, polluted water and buildings visible from the river.

Over three-fourths of the rafters surveyed felt that all of the resource impacts listed were *not a problem* on the Youghiogheny River (Table E-1). Among all the items listed, litter on the river banks was considered a problem by more rafters (26%) than any other item, but most of these rafters considered it only a slight problem. Logging of forests and polluted water were more likely than the other items to be considered serious problems; however, only a small minority (less than 10 percent) of the rafters surveyed considered these serious problems.

Table E-1. Rafters' Perceptions of Environmental Problems Along the Youghiogheny River
(Percentage of Rafters; n=630)

	Not a Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem
Litter in the river	86	11	2	1	<1
Muddy water	78	16	6	<1	<1
Erosion of river banks	81	13	4	1	<1
Trampled vegetation along river bank	84	12	3	<1	<1
Logging of forests visible from river	77	11	5	3	4
Polluted water	76	12	6	4	2
Litter on river banks	74	19	5	2	<1
Buildings visible from river	82	12	4	1	<1

Kayakers were more sensitive to some of the resource impacts examined (Table E-2). They were more likely than rafters to consider litter, muddy water and improper disposal of human wastes to be problems. The greatest difference between groups, however, occurred for the perceptions of logging and polluted water. About half of the kayakers considered these to be problems on the Youghiogheny. Twenty-five percent of the kayakers felt that logging of forests that was visible from the river was a *serious* problem.

The differences between user groups probably reflect differences in experience and familiarity with the river corridor. Kayakers generally have made many trips down the river while most rafters were on their first trip. Thus it is to be expected that kayakers would both notice environmental impacts to a greater extent and be more sensitive to the impacts than rafters. In spite of this difference, though, it is important to remember that *most* kayakers considered *most* of the resource impacts examined *not to be a problem* on the Upper Youghiogheny.

Landowners were much more likely than recreational boaters to consider most of the listed resource impacts a problem (Table E-3). They tended to view litter, both in the river and along the river banks, as the most serious environmental problem. More than two-thirds of the landowners also were concerned about the erosion of river banks, trampled vegetation along the river banks, improper disposal of human wastes, fires, and disturbance of wildlife, although most did not feel these were serious problems.

The greatest difference between the landowners and whitewater boaters involved perceptions of logging along the river. While boaters considered this the most serious environmental problem along the river, the majority of landowners felt logging was not a problem at all. This difference is not surprising since landowners strongly value the right to pursue logging operations on their property. These data do demonstrate, however, that perceptions of impacts may vary considerably across interest groups and are influenced by more than the actual environmental conditions found within the river corridor.

Table E-2. Kayakers' Perceptions of Environmental Problems Along the Youghiogheny River
(Percentage of Kayakers; n=276)

	Not a Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem
Litter in the river	72	19	8	<1	<1
Muddy water	68	19	10	2	<1
Erosion of river banks	77	13	8	1	1
Trampled vegetation along river bank	79	13	5	2	1
Logging of forests visible from river	53	10	12	13	12
Polluted water	52	20	14	11	3
Litter on river banks	62	29	7	1	1
Building visible from river	82	10	4	2	1
Improper disposal of human wastes	74	12	8	3	3
Trails visible from the river	81	11	5	2	1

Table E-3. Landowners' Perceptions of Environmental Problems Along the Youghiogheny River
(Percentage of Landowners; n=44)

	Not a Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem
Litter in the river	15	25	15	15	30
Muddy water	51	22	13	11	3
Erosion of river banks	30	14	32	14	10
Trampled vegetation along river bank	30	27	11	16	16
Litter on river banks	13	13	26	13	35
Improper disposal of human wastes	33	17	10	25	15
Fires	31	19	17	11	22
Disturbing wildlife	32	21	21	16	10
Cutting of trees	49	21	13	3	14
Logging	62	14	19	5	0

Recommendations

The review of existing studies of environmental impacts associated with river recreation, field observations at the Upper Youghiogheny, and perceptions of both recreational users and adjacent landowners all tend to support the general conclusion that environmental impacts are *not* a limiting factor to recreation on the Upper Yough. This is not to say that there are no impacts related to recreation; rather, the impacts that exist are relatively minor, are confined to only a few places, and are not directly related to the amount of use taking place. The following recommendations for management are offered on the basis of the above assessment of environmental impacts.

1) Do *not* establish a limit on the number of people allowed to use the river on the basis of environmental carrying capacity. Instead, pursue a variety of management alternatives emphasizing appropriate site design and user education to mitigate existing impacts and prevent the expansion of environmental impacts within the corridor.

2) It is recommended that MDNR complete the acquisition of the Natural Lands Trust property (currently in progress) and conduct minimal site improvements consistent with the wild and primitive character of the area. These improvements should include a delineated parking area with a hardened surface such as gravel to reduce impacts on vegetation, and composting toilets and changing rooms to eliminate any future problem with improper disposal of human wastes.

3) We recommend that MDNR try to maintain the relatively pristine character of the river corridor by *not* creating additional access points to the river. Any areas opened to recreation without suitable site hardening will become impacted just as the existing access points and recreation sites on other rivers are impacted.

4) We encourage park management at Swallow Falls State Park to pursue their plans for site development to mitigate trampling impacts in the falls area (Riley, 1989).

5) We further recommend that MDNR, in cooperation with the licensed commercial outfitters, initiate a minimum impact education program aimed at teaching river users how to minimize their own impacts on the environment (see Bradley (1979) for a description of a successful program of this type). Most impacts in wild areas result from visitors' ignorance of good land ethics and their insensitivity to the consequences of their actions. The objectives of Bradley's "human approach" are to reduce the impacts of visitors, while keeping regulations to a minimum and teaching visitors the why behind the regulations that do exist. To accomplish these objectives, agency staff reach out to wilderness users and potential users with programs on low impact camping, the Wilderness Act, the natural role of fire, and fire prevention. In the case of the Upper Youghiogheny, it would seem appropriate to focus on minimum impact techniques, as well as the objectives of the Wild River Program. A good source of information to include can be found in Hampton and Cole's recent book, *Soft Paths--How to Enjoy the Wilderness Without Harming It*.

6) Since many of the existing impacts occur on private land, it is recommended that MDNR work with landowners to try to encourage them to take actions to minimize environmental impacts on their property. Such actions might include site hardening and education of clients. In keeping with the wild and primitive character of the area, site alterations should be limited to the minimum necessary to protect the area from ecological degradation. As mentioned in the previous recommendation, demonstrating the reasons behind management decisions and regulations may be an important first step in gaining acceptance.

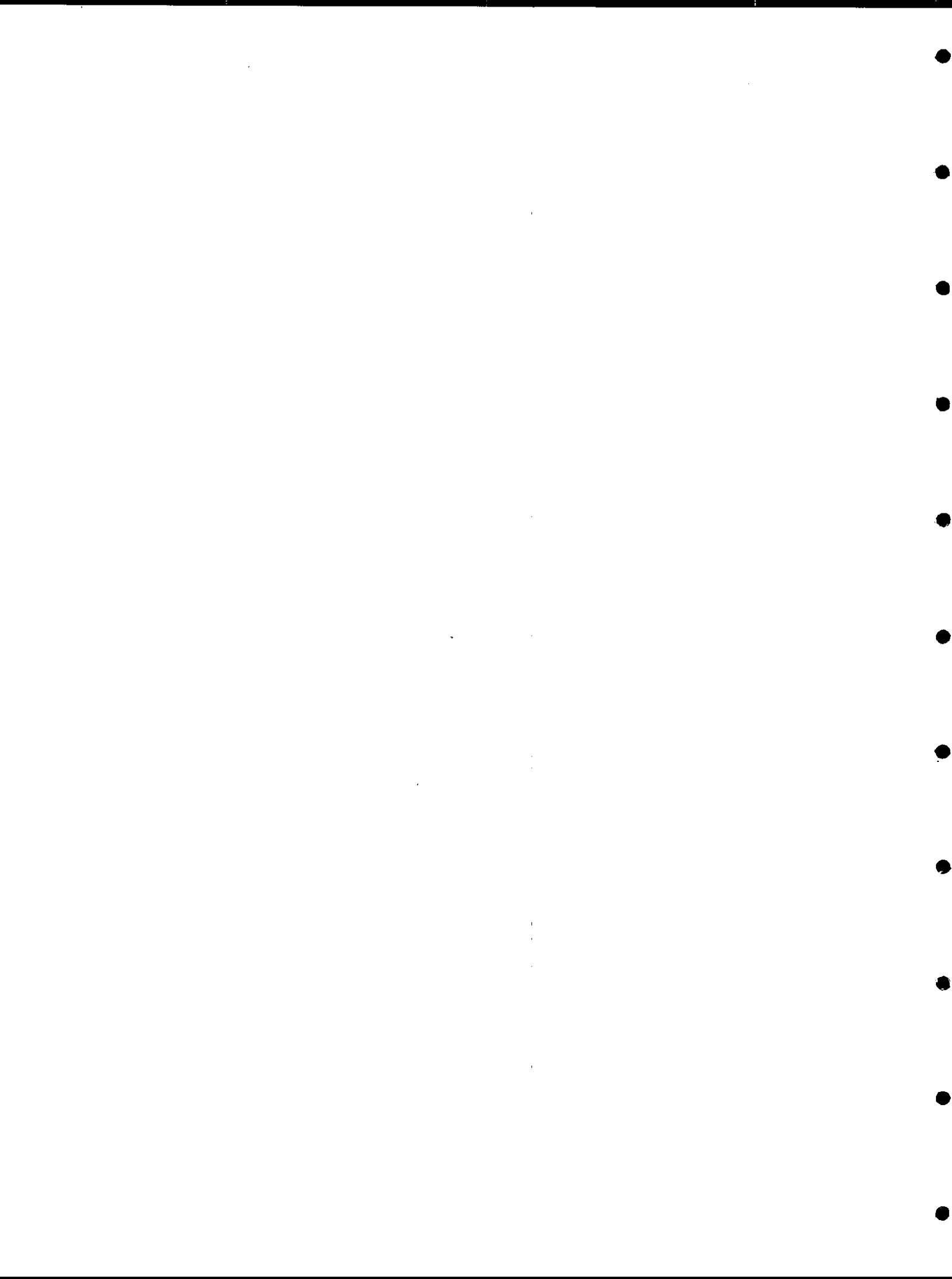
7) Since logging evoked very different responses from whitewater boaters and landowners, it is important that the MDNR enforce existing land use regulations in the corridor in order to prevent *unlawful* operations that negatively impact boaters while protecting landowners' rights to use their property in accordance with the land use guidelines.

8) Finally, it is important to monitor selected environmental indicators in the future. Based on the environmental impacts observed to date, future monitoring should focus on further loss of vegetation and soil erosion at river access points.

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Section F

Economic Impacts Associated With Whitewater Boating on the Upper Youghiogheny River

Introduction

Whitewater boaters using the Upper Youghiogheny River have an economic impact on both Garrett County and the state of Maryland. In addition to the dollars paid directly to the local rafting companies, boaters may spend money on lodging, food and beverages, entertainment, and auto-related items. While in the area, the boaters may also spend money in other local retail establishments for various items, such as souvenirs, boating equipment, clothing. Money is also pumped into the local economy by the outfitters, who conduct trips down the Upper Yough. These expenditures may be for local labor (raft guides), meals for customers, supplies, or local services (insurance, legal fees, etc.).

This section of the study presents an assessment of the economic benefits associated with the whitewater boating that occurred on the Upper Youghiogheny River during 1988. Although the study period for this project cut across two years, the decision was made to focus on calendar year 1988 for a number of reasons. First, data collected for the study provide a means to estimate the total number of boaters using the river during 1988. Second, the outfitters could provide data more easily on a fiscal year basis that ran from January 1 to December 31. Although the information in this section is limited to 1988 data, a summary of the spending reported in the 1989 boater survey is provided in Appendix 3.

Methodology

A sample of whitewater boaters were surveyed both before and after they had run the portion of the Upper Youghiogheny River between the Sang Run bridge and the town of Friendsville (see Section G for a complete description of the visitor survey methods and results). These individuals were then asked to take part in a more extensive questionnaire that would be sent to them. One section of this follow-up questionnaire dealt with the expenditures that these individuals had made during their trip to the Upper Youghiogheny River. Each respondent was asked how much he or she had spent on goods and services in various expenditure categories and where the expenditures had taken place, i.e., within Garrett County, somewhere else in Maryland, or outside of the state of Maryland. If the individual shared expenses with another individual, then the expenditures were to be divided by the number of individuals in that group. For example, if two individuals shared a room, the respondent was asked to list only half of the room expenses. A map was included in the questionnaire to help respondents decide where a particular expenditure was made.

A survey of outfitters that operated on this section of the river during 1988 was also conducted. The outfitters were asked the amounts of various types of expenditures that were made in conducting their business and where the expenditures took place, i.e., within Garrett County or within the state of Maryland.

Economic Benefits Attributed Directly to Whitewater Boaters

The following four tables show a breakdown of expenditures made by rafters and kayakers using the Upper Youghiogheny River in 1988. Table F-1 shows the percentage of each type of boater making a particular type of expenditure. Table F-2 shows the estimated average expenditures made by each river user in 1988. Table F-3 shows the estimated total expenditures made by all users of the Upper Yough in 1988. Table F-4 shows the amount of expenditures made by out-of-state residents in Maryland.

An important consideration in economic impact studies is whether or not the individual would have made the expenditure anyway. The results of this study indicated that 87 percent of the kayakers and 90 percent of the rafters visited Garrett County for the primary reason of running the Upper Youghiogheny River. Other reasons that were mentioned for visiting Garrett County included visiting friends, wanting to get away, running a nearby river, the Gauley festival, and just passing through.

The results in Table F-1 show the percentages of rafters and kayakers that made each type of expenditure. Nearly 9 out of every 10 rafters (88 percent) in the sample had eaten in a restaurant in Garrett County, and over three-fifths of these individuals (62 percent) had bought additional food and beverages and had made auto-related expenditures. Over half (53 percent) paid for some type of overnight accommodation in Garrett County. The rafters also had an impact on the local retail market. One-fifth of the rafters bought clothing or equipment related to their trip in Garrett County and one-third purchased some other type of retail item. The majority of expenditures in each category were spent within Garrett County.

Table F-1. Percentage of 1988 Rafters and Boaters Making a Particular Type of Expenditure in Garrett County, the State of Maryland and Out-of-State

Type of Expenditure	Rafters (N=278)			Kayakers (N=203)		
	Location of Expenditure			Location of Expenditure		
	Garrett Co.	Rest of MD	Out-of-State	Garrett Co.	Rest of MD	Out-of-State
Restaurants	88	22	46	81	22	39
Food and Beverages	62	16	30	77	10	27
Lodging expenses						
Hotel/Motel	33	4	20	4	<1	4
Camping	17	2	12	16	3	18
Other	3	0	3	1	0	0
Night Clubs, Bars, Lounges	28	4	18	18	<1	8
Other Entertainment	8	3	5	4	1	5
Clothing and Equipment	20	4	15	10	2	15
Other retail store purchases	33	7	15	19	4	9
Auto expenses	62	21	54	72	22	42
Other expenses	11	5	8	6	<1	4

The vast majority of kayakers (81 percent) also ate in Garrett County restaurants. Kayakers were more likely to purchase food and beverages (77 percent) and make an auto-related expenditure (72 percent) than their rafting counterparts. Kayakers were less likely to pay for overnight accommodations (21 percent) than rafters, and were less likely to make retail purchases of any kind.

The results in Table F-2 show that within Garrett County, rafters and kayakers averaged spending the most money in restaurants (\$20.78 and \$16.77 respectively). The next largest expenditure for rafters in Garrett County was for hotel/motel accommodations, while the next largest expenditure for kayakers was auto expenses. Although fewer kayakers than rafters made a clothing or equipment related purchase, it is interesting to note that the average amount spent by kayakers was significantly higher. This is probably due to the specialized equipment that kayakers use and the fact that both high-quality kayaking paddles and kayaks can be purchased in Garrett County. Both rafters and kayakers spent a significant amount on food and beverages outside of restaurants.

Not including the amount spent on guide and raft services, the results in Table Two indicate that, during their trip, rafters spent an average of \$90.27 and kayakers spent an average of \$61.31 within Garrett County. Rafters spent an additional \$25.30 and kayakers spent an additional \$12.11 within the state of Maryland. Approximately 78 percent of the rafters' average in-state expenditures and 84 percent of the kayakers' average in-state expenditures were made within Garrett County.

Overall, rafters spent an average of \$263.94 during their entire trip (this includes the amount spent on raft and guide services) and kayakers spent an average of \$146.40. A study of the Kennebec River in Maine in 1981 found that a river user there spent an average of \$175.19 (White and Kezis, 1983). Based on the consumer price index, this would be equivalent to \$220 in 1988 dollars. That study also found an average expenditure of \$195.39 on the Penobscot River in 1981, which would be equivalent to \$245 in 1988 dollars.

Table F-3 shows the total expenditures made by each type of boater. The figures were derived by multiplying the average expenditure per category in Table Two by the estimated number of users in 1988 (see Section C for a complete description of how these numbers were derived). The total direct impact on Garrett County, excluding the cost of the raft trip, was \$577,728 for rafters and \$220,716 for kayakers. The total direct impact on the state of Maryland was \$739,658 for rafters and \$264,312 for kayakers.

The direct expenditures made by rafters and kayakers (excluding money paid to outfitters) within Maryland during 1988 were estimated to have exceeded one million dollars (\$1,003,970). In addition, more than one-half million dollars was spent on commercial outfitting services. Three outfitters operate within the state of Maryland (all three are located within Garrett County). Based on figures provided by all outfitters operating on the Upper Yough in 1988, it is estimated that these three outfitters accounted for 42 percent of those paying for raft and guide services. Thus, an additional \$228,534 were spent within Maryland (specifically Garrett County) for guide and raft services, increasing the total direct impact on the county to \$1,026,978 and the overall impact on Maryland to \$1,232,504.

Table F-2. Estimated Average Daily Expenses For Individual Rafters and Kayakers
During the 1988 Boating Season

Type of Expenditure	Rafters (N=278)			Kayakers (N=203)		
	Location of Expenditure			Location of Expenditure		
	Garrett Co.	Rest of MD	Out-of-State	Garrett Co.	Rest of MD	Out-of-State
Restaurants	\$20.78	\$7.03	\$14.78	\$16.77	\$3.10	\$12.73
Food and Beverages	10.61	3.67	6.94	12.27	1.08	7.91
Lodging expenses						
Hotel/Motel	17.84	1.96	7.68	1.85	0.34	3.25
Camping	2.50	0.21	2.32	1.94	0.27	2.38
Other	0.52	0.00	0.33	0.21	0.00	0.00
Night Clubs, Bars, Lounges	5.61	1.81	4.15	2.98	0.05	1.59
Other Entertainment	1.39	0.80	2.06	0.47	0.15	0.70
Clothing and Equipment	5.50	0.62	6.36	9.44	1.47	18.42
Other retail store purchases	5.36	1.36	3.44	2.06	0.52	4.13
Auto expenses	13.41	6.26	14.37	12.34	5.08	16.67
Other expenses	6.75	1.58	5.11	0.98	0.05	1.01
Totals*	90.27	25.30	67.54	61.31	12.11	68.79
Total Spent in Maryland*	\$115.57 per rafter			\$73.42 per kayaker		
Total Spent Regardless of Where**	\$263.94 per rafter			\$146.40 per kayaker		
Average Guide and Raft Service:	Rafters = \$80.83			Kayakers = \$4.19		

* Does not include guide and raft services

**Includes amount spent on guide and raft services

It is noteworthy that the amount of money Upper Youghiogheny boaters spent outside of Maryland totaled almost another million dollars (\$995,494). This total includes \$679,900 in direct expenditures by rafters and kayakers plus \$315,594 paid to out-of-state outfitters (or 58% of the total amount spent for outfitter services).

As mentioned previously, the vast majority of boaters indicated that they came to Garrett County for the primary reason of running this section of the river. This is one indication that the dollars would not have been spent in the area if the resource were not available. Another indication of whether or not the expenditure

would have been made without the presence of the resource is the origin of the boater. It could be argued that expenditures made by someone from Garrett County who boated on the Yough would have been made regardless of whether or not that individual went boating. For example, the individual might have gone out to dinner anyway or purchased gasoline for his or her vehicle.

Table F-3. Estimated Total Spending For All Rafters and Kayakers for 1988 Boating Season

Type of Expenditure	Rafters (N=6400*)			Kayakers (N=3600*)		
	Location of Expenditure			Location of Expenditure		
	Garrett Co.	Rest of MD	Out-of-State	Garrett Co.	Rest of MD	Out-of-State
Restaurants	\$132,992	\$44,992	\$94,592	\$60,372	\$11,160	45,828
Food and Beverages	67,904	23,488	44,416	44,172	3,888	28,476
Lodging expenses						
Hotel/Motel	114,176	12,554	49,152	6,660	1,224	11,700
Camping	16,000	1,344	14,848	6,984	972	8,568
Other	3,328	0	2,112	756	0	0
Night Clubs, Bars, Lounges	35,904	11,584	26,560	10,728	180	5,724
Other Entertainment	8,896	5,120	13,184	1,692	540	2,520
Clothing and Equipment	35,200	3,968	40,704	33,984	5,292	66,312
Other retail store purchases	34,304	8,704	22,016	7,416	1,872	14,868
Auto expenses	85,824	40,064	91,968	44,424	18,288	60,012
Other expenses	43,200	10,112	32,704	3,528	180	3,636
Totals**	\$577,728	\$161,930	\$432,256	\$220,716	\$43,596	\$247,644
Total Spent in Maryland**	\$739,658 for rafters			\$264,312 for kayakers		
Guide and Raft Service	Rafters = \$517,312			Kayakers = \$26,816		

* Total number of rafters and kayakers in 1988

**Does not include guide and raft services

The results of the present study indicate that this is not the case for either Garrett County or the state of Maryland. Approximately 93 percent of the rafters and 89 percent of the kayakers were not residents of Maryland. For example, of the \$249,516 spent by boaters within Maryland on restaurants, \$225,093 were "new" monies brought in by out-of-state visitors. Of the \$1,003,970 spent by rafters and kayakers in Maryland, \$901,767 was contributed by people living outside of the state. This expenditure pattern is even more pronounced in Garrett County. Nearly 98 percent of all boaters were not residents of Garrett County. Thus, nearly the entire local economic impact was caused by nonlocal residents.

Table F-4. Amount of Spending by Out-of-State Residents in Maryland

Type of Expenditure	Total \$'s spent by all boaters in Maryland	Total \$'s spent by out-of-state boaters in Maryland	Percentage of total \$'s spent by out-of-state boaters
Restaurants	\$249,516	\$225,093	90%
Food and Beverages	139,452	129,956	93%
Lodging expenses			
Hotel/Motel	134,614	125,784	93%
Camping	25,300	23,577	93%
Other	4,084	3,541	87%
Night Clubs, Bars, Lounges	58,396	52,102	89%
Other Entertainment	16,248	14,824	91%
Clothing and Equipment	78,444	70,776	90%
Other retail store purchases	52,296	49,288	94%
Auto expenses	188,600	163,658	87%
Other expenses	57,020	43,168	76%
Totals	\$1,003,970	\$901,767	90%

In addition to this direct impact, there is also an additional economic impact due to what is called the multiplier effect. For example, part of each dollar paid by a boater or outfitter to a local restaurant is re-distributed to employees and other businesses. These employees and other businesses then buy additional goods and services within the local economy. The multiplier represents the number of times that an average dollar turns over within a specific area. Multipliers for the state of Maryland (according to the Department of Economic and Employment Development) range between 1.6 and 2.4 depending on a number of factors, such as the extent to which the local area is dependent on outside areas for goods, services, and its labor pool. Thus, a conservative estimate of the total direct and indirect economic impact in Garrett County from nonlocal residents during 1988 is \$1,277,188 (1.6 * \$798,243). The total direct and indirect economic impact for the state of Maryland from non-state residents was \$1,442,827 (1.6 * \$901,767). The amount paid directly to outfitters for raft and guide services is not included in these figures and will be discussed in the next section.

Economic Impact of Rafting Companies

Each of the companies officially operating on the river during 1988 was asked to estimate the amount of money the company spent during 1988 on goods and services in various categories within Garrett County and within the state of Maryland. Of the ten companies that provided reports to the Maryland Department of Natural Resources regarding the number of their customers during 1988, eight companies responded to our

request for information. These eight companies accounted for approximately 80 percent of the customers that ran the river during 1988.

The estimates provided by the companies were used to get an average expenditure per customer for each of the expenditure categories. These averages were then used to estimate expenditures for the two nonreporting companies. The actual totals for the eight companies that submitted data were added to these estimates to get the figures shown in Table F-5.

The results in Table F-5 indicate that the outfitters spent an estimated \$192,911 in Maryland during 1988. Nearly 92 percent of this amount was spent within Garrett County.

Three of the ten raft companies maintain operations within Garrett County. These three companies accounted for approximately 42 percent of the total number of individuals that ran this section of the Upper Youghiogheny River during 1988. Although these three outfitters accounted for less than 50 percent of the whitewater rafters, these companies accounted for the majority of the expenditures made in Garrett County, especially in the case of personnel.

The rafting companies spend their money on a wide range of services, from advertising to legal. The largest expenditure (\$79,008) was for personnel, which represented nearly 41 percent. This is not surprising considering there is one raft guide for every three customers. The next highest amount was spent on food expenditures. All the reporting companies indicated they had purchased food locally, with the exception of one company that reported no expenditures within the state of Maryland. During 1988, these outfitters indicated that they paid over \$17,000 in taxes. Local individuals and businesses benefited from put-in and take-out fees that totaled approximately \$10,000.

Land Values

The property tax base of Garrett County has risen from \$207 million in 1979 (Maryland Department of Economic Development) to \$346 million in 1989 (Garrett County Office of Assessment). Although the increase in value reflects changes due to the impact of inflation, most of this increase can be attributed to the rapid rise in land values surrounding Deep Creek Lake. According to local realtors, land in the Deep Creek area now sells for up to \$125,000/quarter acre, if it can be found.

The decision was made to look at land transactions during the last ten years. In 1979, two parcels located along the river corridor changed hands. The first, a 100 acre parcel, sold for \$917 an acre and the second, a 34 acre parcel, sold for \$2,177/acre. Records were found for three transactions which occurred between 1979 and 1987. These tracts sold for a low of \$99/acre to a high of \$1619/acre.

Records were found for eight transactions made during 1988 and 1989. Only one parcel showed a significant increase in the cost per acre above the 1979 values. Although the records indicated an unimproved building on the land, the 2.71 acre tract sold for \$61,500. Of the remaining six transactions, five were priced between \$699/acre and \$2826/acre. The remaining property sold for \$5,164/acre.

Table F-5. Reported Outfitter Expenditures for the Period January 1, 1988 to December 31, 1988 in Maryland

Type of Expenditure	Amount Spent	Percentage of Total Expenditures
Food Expenditures		
(lunch, beer, ice, snacks, etc.)	\$22,070	11%
Boating Equipment Purchased		
(rafts, paddles, life preservers, etc.)	12,145	6%
Boating - Repair and Maintenance	1,025	1%
Transportation - Gas/Oil	3,996	2%
Transportation - Repairs	3,729	2%
Put-in and Take-out Fees	10,351	5%
Payroll for Personnel		
(guides, drivers, managers, owners, others)	79,008	41%
Rent	3,900	2%
Utilities	5,351	3%
Insurance - Liability for Rafters	4,174	2%
Insurance - Transportation and Other	4,827	3%
Taxes - Entertainment	10,808	7%
Taxes - Property	771	<1%
Taxes - Sales	460	<1%
Taxes - Personnel Related	3,842	2%
Taxes - Other	1,778	1%
Advertising		
(brochures, printing, postage, etc.)	7,805	4%
Other Printing Costs	2,868	1%
Bookkeeping Costs	2,542	1%
Lawyers	530	<1%
Training/Educational	1,152	1%
Licenses/Permits	600	<1%
Miscellaneous Supplies	1,948	1%
Building Supplies	2,100	1%
Retail Items		
(T-shirts, clothing, postcards, etc.)	3,000	2%
Photography/VCR Expenses	2,131	1%
Totals	\$192,911	

*Approximately 92% of the total expenditures were made in Garrett County.

According to Garrett County Realtors, there were three properties located in the corridor area that were being offered for sale as of August 31, 1989. Two of these properties were located on the river but were not within the officially designated wild river corridor. The first was a 1.5 acre piece of land. The asking price for this tract was \$8,000. The asking price for the second tract, a 2.93 acre of land, was \$28,000. The third tract consisted of 368 acres, 80 of which are located in the official river corridor. The asking price for this tract averaged \$1,478/acre.

One tract, no longer on the market, but located in the river corridor, backed up to the river and had a mobile home located on the property. The asking price for this 5 acre piece of land was \$35,000 or \$7,000/acre. According to local realtors, the average selling price of rural land in the county ranges between \$8,000 to \$10,000/acre, depending on the suitability of the land for farming.

Although the corridor is considered to be a slow market in terms of property sales, one local realtor attributed this more to the size of the acreage, rather than the presence of the river. Most of the tracts in this area are large, and the owners have seemed reluctant to break up holdings. This realtor did feel that having state land bordering a property would add to the perceived value of a piece of property, regardless of where it was located.

Land owners were asked in the land owner survey to indicate how they felt the value of their property had been affected by the wild river classification. Of those who responded, 24 percent of the land owners felt the land had increased in value, 43 percent felt there was no change, and 33 percent felt their land had decreased in value as a result of the wild river designation.

Further Economic Development Related to Whitewater Boating

As the economic impact information indicates, there are a number of existing businesses within Garrett County that owe all, or at least a substantial part, of their existence to whitewater boating on the Upper Youghiogheny River. The three rafting companies operating within Garrett County are the most obvious businesses relying on the Upper Youghiogheny for their existence. However, as the previous information indicated, local restaurants, service stations, convenience stores, bars, the local motel, etc., also benefit from the whitewater boaters. One local equipment supplier, Demaree, provides rafts for at least three of the outfitters operating on the Upper Yough.

With the exception of Demaree, the potential for further expansion of these existing industries appears limited for a number of reasons. First, in 1989, the number of outfitters operating on the Upper Yough and the number of boaters each operator could serve on a given day were regulated by the Maryland Department of Natural Resources. The established use limits are below the current capacity levels of the outfitters presently operating on the river. On the other hand, the number of customers observed on the river during 1988, when no use limits were in effect, only rarely exceeded the maximum of 72 imposed by the 1989 regulations. Although the ultimate effect of these or future regulations on the economic viability of these rafting companies is not known, it would not appear economically feasible for new rafting companies to operate in this environment.

even if the regulations were relaxed. Likewise, it appears that other existing businesses, such as restaurants, have excess capacity that could handle additional demand for their services. Even if they couldn't, facilities around Deep Creek Lake could meet the anticipated additional demands related to river recreation.

Even without any restrictions, there are several constraints which may act to limit growth in the numbers of boaters using the Upper Yough. Although interest in whitewater boating appears to be increasing (see Section C), the Upper Yough is a dangerous river requiring advanced skill levels, even among rafters. Thus, the potential demand for the river is limited to those who pursue the sport on a serious level (for those seeking only a "whitewater experience," several other nearby rivers are available at a lower cost).

Another constraint is the unpredictable nature of the boating season, which usually runs from the beginning of April to the beginning of November. Varying climatic conditions can greatly influence the amount of opportunity to run whitewater trips on the Upper Yough, as described in Section B. The boaters also rely on Penelec for releases from the Deep Creek Dam. In the past, these releases have not always occurred on a regular basis, nor have the release levels been very predictable. Thus, operating a business that is dependent on the Upper Yough, at the very least, is a risky proposition.

One area that does look promising is the production of life jackets and raft paddles. At the present time, the nearest outlet for paddles is in Michigan, and life jackets come principally from Idaho and Alabama. Considering the amount of whitewater boating that occurs within a one hour drive of Friendsville, this could be a viable proposition. A campground might also be a viable economic alternative. There is a Corps of Engineers Campground located near Friendsville, but many of the boaters presently use a campground located in West Virginia.

Costs Associated With Managing Whitewater Boating on the Upper Youghiogheny

The analysis of costs associated with the management of the Upper Youghiogheny River Corridor was limited to those costs incurred by local and state governments. It must be kept in mind that these costs were not intended to produce an economic benefit, and would have been incurred regardless of whether or not the resulting Wild and Scenic River classification resulted in an economic benefit. Thus, it is not appropriate to state that any expenditures resulted in "X" amount of dollars being generated.

A problem that arose in doing this particular assessment was the process which began in 1989 to shift the responsibility for this river corridor within the Maryland Department of Natural Resources (DNR) from the Capital Programs Land Planning Services Division (CPLPS) to the Maryland Forest, Park, and Wildlife Services Division (FPWS). Thus, the following estimate for 1988 includes costs from both departments, although FPWS will have the primary responsibility for the river corridor after 1989.

In 1988, approximately \$47,000 of the operating costs of the Maryland Department of Natural Resources were associated with the Upper Youghiogheny River Corridor. Approximately \$25,000 was incurred by the CPLPS, which includes a pro-rated portion of the river planner's salary, other staff in this department,

travel expenses, and secretarial support for matters relating to the Upper Youghiogheny River Advisory Board. Approximately \$22,560 (1/2 of the 1988-1989 FY appropriation) was spent by the FPWS during this period, which included the salary for the on-site manager, who began his river responsibilities in the fall of 1988. Considering the amount appropriated by FPWS for this project for fiscal year 1989-1990, and the anticipated reduction in the amount of time to be spent by CPLPS staff after 1989, it appears that the project will cost DNR approximately \$50,000 each year in direct operating costs for the foreseeable future.

The DNR also spent \$225,000 during 1988 on land acquisition. The state of Maryland has earmarked an additional \$1.5 million for land acquisition, which will be divided between the three state designated scenic rivers.

According to John Nelson, Planning and Zoning Director in the Garrett County Economic Development Department, recreation use on the Upper Youghiogheny River is minor compared to the recreation use on Deep Creek Lake. Thus, he feels that the whitewater use on the river does not result in any significant costs to the county, either for planning purposes or supervision. Harland Tichnell, Chief Deputy for the Sheriff's Office, indicated that no additional patrols are required because of the whitewater boating activities, and that the only additional costs that would be incurred would be those that resulted from overtime duty required by an emergency.

Conclusions

The total number of whitewater users on the Upper Yough in 1988 was not large (10,000) compared to visitation levels on other whitewater rivers. These whitewater users nonetheless had a combined estimated direct economic impact of about \$1 million on Garrett County and \$1.2 million on the state of Maryland. Nearly 100 percent of the expenditures made in Garrett County were made by nonlocal residents, and nearly 90 percent of the expenditures made in the state were made by nonMaryland residents.

It is important to note that approximately \$700,000 was spent outside the borders of Maryland. Although it was beyond the scope of this study, further research could help to indicate what part of these expenditures could be captured by the state of Maryland and at what cost. For example, some of the users of the Upper Yough are staying overnight at campgrounds in West Virginia. The question remains as to the economic viability of developing additional campgrounds within Garrett County. Also, it may be possible to increase clothing and equipment sales within Garrett County through additional efforts to make users aware of what is available in the county. This applies to other attractions as well.

It does not appear that the wild and scenic river classification has had much of an impact on the price of land located within the corridor. The price of property is determined by many factors, so it is dangerous to make generalizations based on a limited number of individual transactions. The transactions that were documented in this study, however, did not indicate any significant increase or decrease in the price of land within the designated corridor during the last 10 years.

Decisions made by the Maryland Department of Natural Resources will obviously impact the amount of economic benefits that will accrue from whitewater boating on the Upper Yough. For example, an upper limit on the number of rafters was established for the 1989 boating season. Table F-2 provides a way of determining the economic impact that each rafter has on the local and state economy and thus can be used in figuring the potential economic impact of various projected use levels.

References

White, G. K. and A. S. Kezis. 1983. A determination of the economic activity generated by commercial rafting on the Kennebec and Penobscot Rivers and the rivers' feasible carrying capacity. Report submitted to the Whitewater Outfitters Association of Maine, 31 pp.

Section G

Visitor Survey Results

This section of the report presents the major findings of the surveys of whitewater boaters that were conducted during the 1988 and 1989 boating seasons. The purpose of these surveys was to obtain background information on the boaters who use the Upper Youghiogheny as well as information regarding boaters' expectations and perceptions of their experience on the river and their preferences related to several management issues.

Information provided directly from whitewater boaters was needed to address several components of this study, including the Recreational Use Assessment (Section C), the Environmental Impact Assessment (Section E), and the Economic Impact Assessment (Section F). Survey results presented in these earlier sections will not be repeated in this chapter. The whitewater boater surveys also provided data that were needed in the assessment of boating capacity from a social or experiential standpoint (Section D).

Survey Methods

Several survey techniques were used to collect the various types of data that were needed from whitewater boaters. Onsite interviews were conducted at put-in and take-out points to obtain boaters' reactions immediately prior to and after their river trips, respectively. Mail questionnaires were sent to individuals who had been contacted in the field to collect more detailed information from boaters after they had returned home from their trips.

Each survey component was designed to collect the types of information that were most appropriate at the particular time the survey was administered. For example, the onsite pre-trip survey involved a short, self-administered questionnaire focusing on boaters' expectations about their trip. It was important to measure these expectations prior to the experience because the expectations may be influenced by what happens during the trip.

Similarly, the onsite post-trip surveys focused on measuring boaters' perceptions of the trips they had just completed. Boaters were asked detailed questions about the numbers of boats they encountered on the river at a time when this information was fresh in their memory. The main focus of these post-trip surveys was to assess boaters' perceptions of the quality of their experience.

The reasons for including mailback surveys in addition to the onsite questionnaires were twofold. First, it was necessary for the measurement of trip expenditures to contact boaters after their trips had been completed. Second, development of a mail questionnaire allowed the opportunity to collect much more detailed information regarding boaters' perceptions and preferences.

Onsite Survey Procedures

The objective of sampling boaters in the field was to contact as many boaters as possible on selected sampling days. Because boaters typically arrived at put-in and take-out points in groups, a self-administered survey format was chosen. For both the pre-trip and post-trip surveys, study personnel approached boaters and asked them to participate in the voluntary visitor survey. Individuals who agreed to participate (95 percent of those contacted) were given a pencil and clipboard with the single page self-administered questionnaire (see Appendix 5 for copies of all survey materials). The interviewer then collected the survey forms as they were completed by the respondents. This procedure allowed the interviewer to collect information quickly from many people simultaneously, which was necessary given the time constraints present when boating groups are beginning and ending their trips.

Onsite sampling was conducted on approximately 20 days between August 15 and October 15, 1988 and another 20 days between April 14 and July 31, 1989. During both years, study personnel were present at the river on those days which were most likely to have commercial river trips. Thus, we were there nearly every Friday, when commercial outfitters are most likely to run trips, and on some Mondays, the second most popular day for commercial raft trips. The sampling schedule also included some other weekdays in order to ensure that the complete range of boating densities and conditions were represented.

Nearly 1,500 onsite surveys were completed during the course of the study (Table G-1). During the 1988 sampling, nearly equal numbers of rafters and kayakers were interviewed. During 1989, the number of kayakers included in the sample was far less than the number of rafters, primarily because there were fewer kayakers at the river during this time. The final sample included a total of 933 rafter surveys (64% of all onsite surveys) and 531 surveys completed by kayakers (36%). About 56 percent of the onsite surveys completed were post-trip surveys, while 44 percent were pre-trip surveys.

Table G-1. Summary of the Number of Boaters Participating in the Onsite Visitor Surveys

	Pre-Trip Survey	Post-Trip Survey	Total
Rafters			
1988	202	340	542
1989	231	260	491
Total	433	500	933
Kayakers			
1988	189	274	463
1989	23	45	68
Total	212	319	531

Mail Survey Procedures

Boaters participating in the onsite interviews were asked to give their names and addresses, which provided a mailing list for the follow-up mail survey. For the 1988 survey, the mail questionnaires were sent to sampled boaters at the end of the boating season (November 1988). Thus, the boaters received the questionnaires between one and three months after the day they were contacted in the field. Separate versions of the survey were developed for kayakers and rafters. There were two major differences between the two versions of the survey. First, rafters were asked primarily about their river trip on the day they were contacted in the field, while kayakers point of reference varied because they typically run the river frequently and thus could not be expected to remember the details of a particular sampled trip. Some questions in the kayaker survey asked about their most recent trips and other questions focused on kayakers' reactions to the 1988 boating season in general. The second difference between survey versions was that kayakers received some additional detailed questions asking for their perceptions and preferences relative to varying water conditions on the river (e.g. 2-hour versus 3-hour hydropower releases). Rafters were not asked these questions because most of them have little or no experience on the river and thus could not be expected to understand such questions.

These procedures were modified for the 1989 survey because the sampling started at the beginning of the boating season and it was therefore inappropriate to wait until the end of the season to conduct the mail follow-up. This year, the mailback questionnaires were sent to all boaters sampled in the field the week after they had been contacted onsite. Since the boaters received their surveys within a week of the field contact, both rafters and kayakers received the same version of the questionnaire. The detailed questions in the 1988 kayaker survey were not included in the 1989 survey because the large majority of boaters receiving the 1989 questionnaire were rafters. Some additional questions related to respondents' commercial rafting experience were included in the 1989 survey (see Appendix 5).

Aside from these differences between years, all survey mailings were handled in a consistent manner. Boaters initially received the questionnaire with a cover letter and prepaid business reply envelope. Post card reminders were sent about a week later. Those who had not responded within another 10 days were sent another copy of the questionnaire with a new cover letter encouraging them to respond. Finally, sample members whose completed questionnaires had not been received within another 10 days were sent a final mailing that included a copy of the questionnaire and a new cover letter.

Seventy-three percent of the 1,307 questionnaires sent to whitewater boaters were returned in usable form (Table G-2). Kayakers were somewhat more likely to complete the survey, as would be expected in light of their generally higher level of experience on and interest in the Youghiogheny River.

The following results show the responses to the surveys by type of boat (rafters versus kayakers). The few individuals using canoes and duckies have been combined with the kayakers. In general, the results obtained during 1988 and 1989 have been combined. Where significant differences between years were found, however, the results for each year are presented.

Table G-2. Summary of the Number of Boaters Participating in the Mailback Visitor Surveys

	Number Mailed	Number Undeliverable	Usable Number Returned	Usable Response Rate
1988 Rafter Version	462	12	320	71%
1988 Kayaker Version	278	8	222	82%
1989 Version (Rafters and Kayakers)	567	13	389	70%
Total	1307	33	931	73%

Survey Results

Description of Boaters

Youghiogheny River users sampled in this study were typically males with education and income levels above the average levels found in the general population (Table G-3). About two-thirds of both rafters and kayakers had graduated from college or pursued graduate study. About half of both rafters and kayakers were between the ages of 25 and 34, with nearly another one-third between 35 and 44.

Rafters. Eighty percent of the rafters were male, with an average age of 34 years. Rafters were not quite as likely as kayakers to have pursued education beyond a college degree. Rafters did tend to report slightly higher income levels, however, than kayakers.

Nearly all of the rafters sampled (91%) had some previous whitewater river experience; the average number of years running whitewater rivers was 5.8 and the average number of different rivers run was five (Table G-4). Most (72%) of the individuals sampled in the field, however, reported that they were on their first trip on the Upper Youghiogheny. Seventy-two percent also indicated that they planned to run the Upper Yough again next year.

Those rafters with previous experience on the Upper Yough (28%) had been running the river for an average of 3.2 years. Some of these individuals reported having made numerous previous trips down the Yough. Thus, the average number of runs shown in Table G-4 reflects the influence of these very active boaters. Most of the rafters with previous experience had made only one or two previous trips down the river.

Kayakers. Ninety percent of the kayakers were male, with an average age of 33 years. Less than one-third of those sampled (28%) had begun kayaking the Upper Youghiogheny this past season, and the average number of years of experience on the Upper Yough was 3.8 years (Table G-4). The kayakers sampled were generally very active and experienced whitewater boaters, with an average of nearly 9 years of overall river running experience. Sampled kayakers reported running whitewater rivers an average of 54 times during 1988; 13 of these whitewater trips were on the Upper Yough. Thus, kayakers who run the Upper Yough tend to spend a lot of time running other whitewater rivers as well. Nearly all of the kayakers (94%) indicated they planned to run the Upper Yough again next year.

Table G-3. Demographic Characteristics of Youghiogheny River Boaters
 - (Percentage of Boaters)

	Rafters (n=635)	Kayakers (n=280)
Age		
Under 25	12	14
25 - 34	47	51
35 - 44	29	29
45 - 54	9	6
55 and Over	2	1
Gender*		
Male	80	90
Female	20	10
Education Level*		
Grade School	0	0
Some High School	2	1
Graduated from High School	7	6
Vocational/Technical School	5	6
Some College	25	18
Graduated From College	35	30
Graduate Study	26	38
Annual Household Income*		
Under \$10,000	4	11
\$10,000 - \$19,999	7	11
\$20,000 - \$29,999	11	16
\$30,000 - \$39,999	17	16
\$40,000 - \$49,999	18	15
\$50,000 - \$59,999	16	10
\$60,000 - \$69,999	10	7
\$70,000 and above	16	13

* Difference between rafters and kayakers significant at the .01 level.

Table G-4. Previous Experience Levels of Upper Youghiogeny River Boaters

	Rafters (n=925)	Kayakers (n=428)
Experience on Upper Youghiogeny		
Percent making first trip*	72%	28%
Average number of years running Upper Yough*	3.2	3.8
Average number of runs during 1988*	7	13
Average number of runs during 1987*	6	9
Average number of lifetime runs*	13	32
Experience on all whitewater rivers		
Percent making first trip*	9%	0%
Average number of years running whitewater rivers*	5.8	3.7
Average number of runs during 1988*	10	54
Average number of runs during 1987*	8	53
Average number of different rivers run*	5	32

* Difference between rafters and kayakers significant at the .01 level.

Reasons for Running the Upper Youghiogeny River

Boaters were asked to rate the importance of various reasons for running the Upper Yough during onsite interviews before their river trips and again in the mail survey. For most of the reasons, there was little or no difference between the onsite and mail questionnaire responses. The most important motives to both kayakers and rafters were to run rapids and to have fun. The least important motive to both groups was "to show others I can do it." Boaters generally placed relatively high value on being with friends and escaping the regular routine, but they were less concerned with getting away from crowds and learning about nature.

Rafters. Rafters tended to give slightly higher ratings for reasons such as having thrills and excitement and taking chances in dangerous situations. They also were more likely than kayakers to view rafting as a means to do something with the family, although most members of both groups indicated this was not an important reason for participation.

Kayakers. Kayakers attached more importance to testing their abilities, keeping physically fit, and developing their skills. They were also more likely than rafters to view their activity as a way to experience peace and calm, to get away from crowds, to view scenery, to think about personal values and to share what they know with others.

Table G-5. Importance Ratings for Various Reasons for Running the Youghiogheny River
(Values shown are average scores on 5 point scale ranging from
not at all important [1] to extremely important [5])

	Rafters		Kayakers	
	On-Site (n=431)	Mailback (n=635)	On-Site (n=209)	Mailback (n=280)
To view the scenery*	3.1	3.3	3.5	3.7
To run rapids**	4.6	4.7	4.8	4.8
To experience peace and calm*	2.4	2.5	3.1	3.1
To do something with the family*	2.1	1.9	1.7	1.5
To get away from crowds*	3.0	3.0	3.4	3.3
To keep physically fit*	2.9	2.9	3.7	3.7
To take chances in dangerous situations*	3.2	3.0	2.8	2.5
To have fun	4.7	4.7	4.8	4.7
To develop my skills*	3.5	3.7	4.3	4.4
To learn more about nature	2.7	2.5	2.7	2.6
To be with my friends	3.6	4.0	3.9	3.9
To release tensions and anxieties*	3.3	3.4	3.6	3.8
To experience the challenge**	4.4	4.5	4.2	4.5
To get away from the regular routine	4.0	4.0	3.8	4.0
To meet new people	2.9	2.6	2.9	2.8
To have thrills and excitement*	4.4	4.4	3.9	4.1
To show others I can do it	2.0	2.1	1.8	2.0
To test my abilities*	--	3.6	--	3.9
To think about my personal values*	--	2.2	--	2.6
To share what I know with others*	--	2.2	--	2.8

* Difference between rafters and kayakers significant at the .01 level for both onsite and mailback.

**Difference between rafters and kayakers significant at the .01 level for onsite only.

Boater Travel Patterns

Most of the boaters sampled in this study were visitors who traveled to western Maryland primarily to run the Upper Youghiogheny. The vast majority of both rafters (89%) and kayakers (85%) live outside of the state of Maryland (Table G-6). Accordingly, most whitewater boaters traveled significant distances to run the river. Over four-fifths (81%) of the rafters reported that they stayed overnight during their trip, while two-thirds (68%) of the kayakers reported staying overnight. Rafters were much more likely than kayakers to stay in hotel or motel accommodations, while kayakers were more likely to stay in campgrounds or with friends.

Table G-6. Travel Patterns of Youghiogheny River Boaters
(Percentage of Boaters)

	Rafters (n=613)	Kayakers (n=275)
Location of Primary Residence*		
Garrett County	2	4
Elsewhere in Maryland	9	11
Other States	88	78
Other Countries	2	8
Distance Traveled from Home (one-way)*		
Under 100 miles	9	24
100 - 199 miles	16	18
200 - 299 miles	24	14
300 - 399 miles	21	8
400 - 499 miles	12	10
500 or more miles	18	26
Type of Overnight Accommodation*		
None - did not stay overnight	19	32
Hotel or Motel	42	5
Campground	30	47
Rented home or cottage	2	2
Stayed with friends	5	12
Condominium	1	0
Seasonal Home	<1	1
Other	<1	1

* Difference between rafters and kayakers significant at the .01 level.

Quality of Whitewater Boating Trips

Boater Satisfaction. The onsite and mailback surveys conducted in this study included a wide selection of indicators of boating quality. Sampled boaters generally were very satisfied with their trips and the conditions they encountered. Most boaters rated their overall trips either excellent or perfect (Table G-7).

Table G-7. Reported Satisfaction Levels with Sampled Upper Youghiogheny River Trips

Satisfaction Rating	Rafters		Kayakers	
	Onsite* (n=581)	Mailback (n=628)	Onsite* (n=320)	Mailback (n=68)
Perfect (1)	32%	26%	26%	18
Excellent (2)	58	58	59	60
Very Good (3)	8	12	12	13
Good (4)	2	3	2	9
Fair (5)	0	1	1	0
Poor (6)	0	0	0	0
Average	1.8	2.0	2.0	2.1

* Difference between rafters and kayakers significant at the .01 level.

Rafters reported slightly higher satisfaction levels immediately after their trip than kayakers did. There was no significant difference between rafters and kayakers in the mailback satisfaction rating. (The number of kayakers included in this comparison is only 68 because kayakers receiving the 1988 mail questionnaire were not asked questions about the particular trip sampled in the field). The 1988 kayaker survey also asked respondents how satisfied they were with their river trips in general during the 1988 season. Results were very similar to those shown in table G-7; the average satisfaction rating among kayakers for 1988 river trips was 2.2.

Responses to additional questions regarding overall trip satisfaction show a strong pattern reflecting boaters' high satisfaction levels (Table G-8). These questions essentially serve as a validity check to the overall trip rating shown in Table G-7. The vast majority of both rafters and kayakers reported that they enjoyed the river trip and found it to be as enjoyable as they had expected it to be. Nearly all respondents strongly disagreed with the statement, "I do not want to go on any more trips like this one." The majority agreed or strongly agreed that they could not imagine a better boating trip.

The largest difference between rafters and kayakers regarding measures of overall satisfaction involved the statement, "my boat trip was well worth the money I spent to take it." Kayakers were more likely to strongly agree with this statement, which is not surprising since kayakers generally paid significantly less money for their trips. It is noteworthy, however, that ninety percent of the rafters also agreed or strongly agreed that their trip was worth the money it cost them.

Table G-8. Responses to Onsite Overall Satisfaction Indicators
(Percentage of Boaters; n=615 rafters and 319 kayakers)

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
I thoroughly enjoyed my river trip today	Rafters	<1	<1	<1	20	79
	Kayakers	<1	<1	<1	16	82
My boating trip was <u>not</u> as enjoyable as I expected it to be	Rafters	66	27	3	2	2
	Kayakers	72	23	1	3	1
I cannot imagine a better boating trip*	Rafters	2	15	18	36	30
	Kayakers	3	18	21	34	24
My boat trip today was well worth the money I spent to take it*	Rafters	<1	2	7	43	47
	Kayakers	<1	0	6	26	67
I do not want to go on any more boat trips like this one	Rafters	79	17	2	1	<1
	Kayakers	88	10	1	<1	1

* Difference between rafters and kayakers significant at the .01 level.

To further probe the determinants of satisfaction, boaters also were asked how well they felt their river trips provided various types of opportunities (Table G-9). Respondents indicated that Upper Youghiogeny River trips were most likely to provide opportunities for thrills and excitement, testing of one's abilities and development of skills, and escape from the regular routine. This finding helps to explain the high levels of satisfaction reported since these types of opportunities were among the most important motives expressed for running the Upper Yough (Table G-5).

The other types of opportunities listed were provided to lesser degrees. All of the types of opportunities considered were provided to at least a fair degree for about ninety percent of the respondents. Nearly all of the opportunities listed were provided to different degrees for kayakers versus rafters. Kayakers were more likely to report that the trip provided excellent opportunities for skill development and testing of one's abilities. Rafters reported greater opportunities for having thrills, getting away from the regular routine, and getting away from crowds.

Table G-9. Boater Responses to the Degree to Which Their Trips Provided Various Types of Opportunities (Percentage of Boaters; n=633 Rafters and 279 Kayakers)

Type of Opportunity		Terrible	Poor	Fair	Good	Very Good	Excellent
To develop my skills*	Rafters	0	1	5	25	37	31
	Kayakers	0	<1	3	16	34	46
To get away from the regular routine*	Rafters	<1	0	3	11	37	49
	Kayakers	<1	1	5	19	41	34
To test my abilities*	Rafters	<1	1	4	16	40	39
	Kayakers	0	1	2	15	36	46
To be part of a group*	Rafters	<1	1	10	32	38	19
	Kayakers	1	2	16	32	32	18
To think about my personal values*	Rafters	3	10	35	30	14	8
	Kayakers	0	4	27	41	18	11
To have thrills and excitement*	Rafters	<1	<1	3	7	31	58
	Kayakers	<1	<1	6	16	33	43
To get away from crowds*	Rafters	<1	3	11	25	34	27
	Kayakers	3	7	26	34	18	12
To experience peace and calm	Rafters	4	8	22	31	22	13
	Kayakers	4	7	30	37	14	10
To share what I know with others*	Rafters	3	8	34	34	14	8
	Kayakers	1	4	29	40	20	6

* Difference between rafters and kayakers significant at the .01 level.

Open-Ended Responses. Boaters were asked in both the onsite and mailback questionnaires what they liked best and least about their river trips. A complete listing of the high and low points reported by both rafters and kayakers is included in Appendix 4. The most common responses by rafters to what they liked best about their river trips were the rapids and the sense of adventure and excitement. When asked what they liked least about their trip, the most common response was the weather, followed by the length of the trip (too short) and waiting for the water.

Kayakers were asked what they liked best and least about their overall boating participation on the Upper Yough during 1988 as well as on particular trips when the water release was three hours and two hours. The scenery, rapids and challenging whitewater were mentioned most frequently as the things they liked best about the past season. Kayakers mentioned a wide variety of things they liked least about last season, the most common of which were the length of the water release, the presence of large groups, and too many rafters on the river.

Perceptions of Boater Densities. The visitor surveys included several direct questions dealing with the numbers of people encountered on the river and the acceptability of these numbers. Both rafters and kayakers tended to report *lower* numbers of contacts with other boats than they either expected or preferred (Table G-10). Thus it is not surprising that 95-98% of both rafters and kayakers felt the number of boats seen on the river was acceptable to them. The exception to this pattern was the responses of kayakers to the number of rafts seen during the 1989 survey. Kayakers sampled during 1989 reported seeing more rafts than they expected, and only 82 percent considered the number seen acceptable. This difference may reflect a change in expectations in 1989 resulting from the restrictions on commercial rafting that took effect this season. That is, kayakers may have expected to see fewer rafts because of the new regulations. This difference should be interpreted with caution, however, since it is based on only 47 kayakers who completed the onsite post-trip survey in 1989.

Study subjects were also asked how many rafts and kayaks they would accept seeing on the river. Responses revealed that both rafters and kayakers would accept seeing slightly more boats than they preferred to see. Both groups reported they would not object to seeing as many as 15 to 17 rafts on the river. Rafters and kayakers differed in the number of kayaks they would find acceptable. Rafters indicated they would accept seeing 15 to 18 kayaks, while kayakers would accept twice as many kayaks on the river.

The onsite survey also included some additional crowding-related indicators to identify various ways in which whitewater trips might be impacted by the number of people on the river. One question asked boaters what percent of the time they were in sight of other groups. Both rafters and kayakers tended to report that they were in sight of other boats about half of the time during their trips down the river.

Another question asked boaters how often they had to wait at the head of a rapids to let another boat go through ahead of them. About two-thirds (64%) of the kayakers indicated they had to wait at some rapids, with 56 percent having to wait only occasionally and 8 percent having to wait often. Nearly half (48%) of the rafters indicated that they never had to wait at the head of a rapid. Another 48 percent reported they had to wait occasionally, and 4 percent of the rafters reported having to wait often.

Rafters reported lower levels of perceived crowding than kayakers during both 1988 and 1989 (Table G-10). Rafters tended to report slightly lower crowding levels in 1989 than in 1988, which is not surprising since they both expected to see and actually saw fewer boats during 1989. For kayakers, the difference in crowding between 1988 and 1989 was not statistically significant.

Table G-10. Boater Perceptions of the Number of People Using the Upper Youghiogheny

	Rafters		Kayakers	
	1988 (n=340)	1989 (n=277)	1988 (n=319)	1989 (n=47)
Pre-Trip Perceptions				
Number of rafts expected (average)*	13	10	15	6
Number of rafts preferred (average)**	13	8	10	8
Number of kayaks expected (average)*	15	8	25	12
Number of kayaks preferred (average)**	11	8	20	16
Post-Trip Perceptions				
Number of rafts seen (average)*	10	8	9	12
Percent considering number seen acceptable***	96%	96%	95%	82%
Acceptable number of rafts to see (average)	16	15	16	17
Number of kayaks seen (average)**	11	5	17	17
Percent considering number seen acceptable	97%	94%	98%	95%
Acceptable number of kayaks to see (average)**	18	15	34	32
Percent of time in sight of other groups	49%	51%	41%	46%
Frequency of waiting at head of rapids (percent)				
Often	4%	3%	7%	13%
Occasionally	50%	45%	55%	58%
Not at all	46%	52%	38%	29%
Perceived crowding (1-9 scale)(average)**	2.7	2.1	3.0	3.3

* Differences between 1988 and 1989 significant for both rafters and kayakers

** Differences between 1988 and 1989 significant for rafters only

*** Differences between 1988 and 1989 significant for kayakers only

Table G-11 compares boaters' perceptions of crowding measured immediately after their trip with their responses to the same question in the mail questionnaire. In both cases, responses to the 9-point crowding measure tended to be towards the not crowded end of the scale, and rafters felt less crowded than kayakers. Both rafters and kayakers tended to report lower levels of crowding when responding on site immediately after their trip than when responding to the same question some time later in the mail questionnaire.

Table G-11. Reported Levels of Crowding Encountered on the Upper Youghiogheny River

Perceived Level of Crowding	Rafters		Kayakers	
	Onsite* (n=617)	Mailback* (n=630)	Onsite* (n=319)	Mailback* (n=66)
1 (not at all crowded)	37%	33%	24%	21%
2	28	19	25	15
3	15	15	18	14
4	7	9	10	9
5	5	6	9	5
6	6	9	8	18
7	2	6	4	12
8	<1	2	1	6
9 (extremely crowded)	0	<1	1	0
Average	2.4	3.0	3.0	3.9

* Difference between rafters and kayakers significant at the .01 level.

The boater surveys also included several other indicators of boating quality related to the number of boats on the river (Table G-12). Some of these indicators focused on perceptions of safety on the river. Most boaters felt that conditions on the river were safe and that there was *not* an unsafe number of boats on the water. In the mailback survey, more than two-thirds of both rafters and kayakers agreed that the number of people on the river was about right.

Most respondents also indicated that they did *not* feel other boats came too close to them, nor did they feel that going through some rapids was dangerous because of the number of boats trying to get through. Kayakers, however, were more likely than rafters to feel that other boats came too close and that going through some rapids was dangerous.

Both rafters and kayakers tended to agree that the Upper Youghiogheny is more fun than other rivers they have run. The majority of both groups also indicated they were pleased with the management of the river and they thought the river and its surroundings were in good condition. Again, however, kayakers were more critical than rafters of the job being done by managers of the river.

Some of the items in Table G-12 were asked only of rafters, while others were included only in the kayaker survey. Nearly all rafters agreed that their guide did a good job of getting them down the river, with nearly two-thirds strongly agreeing. Nearly all kayakers felt there were *not* too many kayakers on the river, while they were more evenly divided in their reaction to the number of rafts. Forty-one percent felt there were too many rafters on the river during 1988, while 39 percent disagreed and 21 percent were undecided.

Table G-12. Responses to Selected Experience Impact Indicators
(Percentage of Boaters; n=615 Rafters and 319 Kayakers)

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
<u>Indicators Measured in On-Site Surveys</u>						
There was an unsafe number of boats on the water today	Rafters	62	30	5	2	1
	Kayakers	56	36	4	2	1
Other boats came closer to my boat than I like*	Rafters	54	35	5	4	1
	Kayakers	46	32	9	9	3
Going through some rapids was dangerous because of the number of boats trying to get through*	Rafters	55	36	6	3	<1
	Kayakers	37	45	8	8	2
Boating conditions on the river today were safe	Rafters	<1	2	3	46	49
	Kayakers	1	1	4	46	48
The behavior of other boaters interfered with the quality of my boating experience*	Rafters	61	36	2	1	<1
	Kayakers	58	33	4	3	1
The trip was too long	Rafters	45	49	4	2	<1
	Kayakers	52	42	4	1	1
The river was more fun than other rivers I have run before*	Rafters	1	4	13	39	44
	Kayakers	2	7	16	44	30
<u>Indicators Measured in Mailback Surveys</u>						
I was pleased by the job being done by managers of the river*	Rafters	2	3	14	43	38
	Kayakers	5	9	34	37	15
I thought the river and its surroundings were in good condition*	Rafters	1	3	2	53	42
	Kayakers	3	9	9	46	34
The number of people on the river was about right*	Rafters	1	10	18	53	18
	Kayakers	4	17	10	56	12
I enjoyed watching other people come through the rapids	Rafters	<1	2	5	64	29
	Kayakers	0	2	6	75	18
I enjoyed being with the people in my group	Rafters	<1	<1	2	42	55
	Kayakers	0	0	0	44	56
I wish there had been more rapids*	Rafters	5	22	18	33	22
	Kayakers	7	49	15	16	13

* Difference between rafters and kayakers significant at the .01 level

Table G-12. Responses to Selected Experience Impact Indicators
(Percentage of Boaters; n=615 Rafters and 319 Kayakers)
Continued

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
Our guide did a good job of getting us down the river**	Rafters	1	3	4	28	64
There were too many rafters on the river***	Kayakers	3	36	21	22	19
There were too many kayakers on the river***	Kayakers	22	55	16	7	<1

** Item included only in rafter version of 1988 mail survey.

*** Item included only in kayaker version of 1988 mail survey.

Relationships Between Use Levels and Quality of the Experience

Assessing the capacity of the Upper Youghiogheny for whitewater boating requires that the relationships between the number of boats using the river and the various measures of experiential quality be documented. This study used several approaches to examine these relationships.

The first step involved determining the degree of correlation between key study variables. Table G-13 presents the correlations between overall trip satisfaction, perceived crowding, and a series of impact variables measured in the onsite post-trip questionnaires. Overall satisfaction generally was *not* strongly related to boating density variables. The *actual* number of boats on the river had no significant influence on the satisfaction levels of either rafters or kayakers. Similarly, the number of boats respondents reported seeing during their trips showed no significant relationships with satisfaction. In an exception to this pattern, there was a slight tendency for kayakers who found the number of rafts seen acceptable to report higher levels of satisfaction ($r=.16$).

Variables that dealt with more specific outcomes associated with increasing use levels tended to show stronger correlations with satisfaction. How often boaters had to wait at rapids for other boats to go ahead of them showed a modest influence on satisfaction, as did several indicators related to perceptions of safety on the river. The variable with the strongest correlation with overall satisfaction (.26 for rafters and .24 for kayakers) was the perception that boating conditions on the river were safe.

The fact that satisfaction showed such weak relationships with the various density-related measures may be partially explained by the relatively low variance in satisfaction among Youghiogheny River boaters (most boaters were very satisfied). It is also likely that satisfaction is influenced to a greater degree by other factors that are not related to the number of people on the river, as discussed earlier in this section.

Perceived crowding showed much stronger correlations with the various density measures (Table G-13). How crowded boaters felt was significantly related to the actual number of boats on the river, the

Table G-13. Correlations Between Boater Satisfaction, Perceived Crowding, and Other Density-Related Variables (Pearson Correlation Coefficients)
(All coefficients shown are significant at the .05 or .01 level; ns=not significant)

	Satisfaction*		Crowding	
	Rafters (n=613)	Kayakers (n=320)	Rafters (n=613)	Kayakers (n=320)
Actual number of rafts	ns	ns	.28	.23
Actual number of kayaks	-.08	ns	.25	.19
Actual number of total boats	ns	ns	.33	.26
Reported number of rafts seen	ns	ns	.34	.44
Acceptability of rafts seen	ns	.16	-.30	-.31
Reported number of kayaks seen	ns	ns	.35	.32
Acceptability of kayaks seen	ns	ns	-.17	ns
Frequency of waiting at rapids	-.14	-.15	.34	.43
Percent of time in sight of boats	-.07	ns	.23	.43
Feeling that boating conditions were safe	.26	.24	-.21	-.26
Feeling there was an unsafe number of boats	-.12	-.24	.48	.44
Feeling some rapids were dangerous	-.17	-.23	.46	.51
Feeling other boats came too close	-.11	-.24	.42	.42
Feeling other boaters' behavior interfered	-.22	-.19	.34	.31
Perceived crowding	-.14	-.18	--	--

* In calculating the correlations, satisfaction scores were reversed from their original coding shown in Table G-7. Thus, positive coefficients indicate a direct relationship with satisfaction and negative coefficients indicate an inverse relationship. For example, the correlation of -.14 between satisfaction and perceived crowding indicates that the more crowded one felt, the less satisfied he or she was.

number of boats seen by respondents, and whether or not the number of boats seen was acceptable. As in the case of satisfaction, safety-related variables had the greatest influence on crowding. For example, those who felt that there was an unsafe number of boats on the water and that going through some rapids was dangerous because of the number of boats tended to report greater levels of crowding. Correlations between crowding and these indicators were much larger than they were between satisfaction and the same indicators. This pattern held true for both rafters and kayakers.

The correlations in Table G-13 demonstrate that the impacts of varying use levels on the whitewater boating experience are complex and interrelated. The number of people or boats on the river had little *direct* influence on boater satisfaction, but the numbers did contribute to perceptions of crowding, which in turn influenced overall satisfaction. In addition, various manifestations of boater density, such as waiting at rapids and feeling that some rapids were dangerous because of the number of boaters, had a strong influence on crowding as well as a direct, albeit weaker, influence on boater satisfaction. These findings are consistent with the results of many other studies of crowding and satisfaction in other recreation areas.

To further probe the effects of boater densities on the quality of the visitor experience, boater perceptions were broken down by both the number of rafts on the river and the length of the water release on the day of their trip. Table G-14 displays the results of these comparisons for those indicators that showed the greatest variation among kayakers. (Results of these comparisons for rafters are not shown because the responses of rafters did not vary significantly under the differing water release conditions.)

The results shown in Table G-14 suggest that the number of rafts on the river starts to have a strong impact on kayakers' experiences when that number exceeds 24 rafts *and* the release is only two hours. When there were not more than 24 rafts on the river, the responses to the density-related variables showed little difference between two-hour releases versus longer water releases. Contacts between parties and perceptions of crowding were relatively low, while satisfaction and acceptance of conditions on the river tended to be high. Similarly, kayakers' responses to more than 24 rafts during three-hour or longer releases generally were similar to their responses to lower raft densities. The responses to more than 24 rafts during two-hour releases, on the other hand, stood out as very distinct from all other conditions examined. Under these conditions, boater contact and crowding levels increased markedly and the proportion of boaters considering the number of rafts on the river acceptable dropped to less than 50 percent.

These results are consistent with the findings of the hydrological assessment (Section B) in that they both identify two-hour water releases as the most limiting factor to the capacity of the Upper Youghiogheny for whitewater boating. Boaters' evaluations of their trips tend to be favorable when there are not more than 24 rafts on the river regardless of the length of the hydropower release. Their evaluations of higher boating densities depend on the length of navigable water available. When larger numbers of rafts run the river during a two-hour release, the result is substantially greater numbers of contacts between rafters and kayakers and much higher levels of concern over safety on the river. Crowding-related measures also increased with higher densities during three-hour releases, but not nearly to the same extent as during the two-hour releases.

It is important to note that the two-hour releases represented in the above analysis occurred during 1989, when natural flows were relatively high. None of these releases occurred during times of very low natural flow such as those found in the summer of 1988 before the start of this study. Thus, none of the boaters participating in this study were exposed to the most limiting water conditions that occur on the Upper Youghiogheny. This fact may partially explain why rafters did not demonstrate the same sensitivity to varying water conditions as did kayakers. It is also likely that rafters simply are more tolerant of higher use levels, since

Table G-14. Kayaker Responses to Selected Indicators by Number of Rafts on the River and Length of Water Release

	0-18 Rafts		19-24 Rafts		25-32 Rafts	
	Two-Hour Release	Three-Hour or Longer Release	Two-Hour Release	Three-Hour or Longer Release	Two-Hour Release	Three-Hour or Longer Release
Satisfaction*	1.7	1.9	1.9	1.9	2.4	2.0
Perceived Crowding**	1.3	2.6	2.1	2.8	5.5	3.4
Number of Rafts Seen	5.0	6.9	8.5	8.2	18.1	10.3
Percent Reporting Number of Rafts Seen Was Acceptable	100.0	94.9	92.9	98.5	42.9	93.8
Percent of Time in Sight of Other Boats	45.7	37.1	38.6	36.0	66.4	46.9
Feeling There Was an Unsafe Number of Boats***	1.0	1.4	1.6	1.5	2.2	1.7
Feeling Other Boats Came Too Close***	2.3	1.7	2.1	1.9	2.5	2.0
Feeling Some Rapids Were Dangerous***	1.0	1.8	2.0	1.8	3.1	2.0

* Measured on 6-point scale where 1=perfect and 6=poor

** Measured on 9-point scale where 1=not at all crowded and 9=extremely crowded

***Measured on 5-point scale where 1=strongly disagree and 5=strongly agree

they basically are seeking a different type of experience.

The higher water levels present during the survey period probably also account for the kayakers general acceptance of 19-24 rafts during a two-hour release. It is not possible to predict how rafters would respond to the more limited conditions of a two-hour release under very low natural flow. It is clear from the

patterns shown in Table G-14, however, that kayakers would tend to react very negatively toward densities above 24 rafts under such water conditions. Kayakers also might react more negatively to densities of 19-24 rafts during two-hour releases when natural flow is low.

The above analysis examined boaters' responses in relation to the actual water conditions on the day they were interviewed. Another approach used to assess the relationship between use levels and the quality of the boating experience involved a series of questions in the 1988 kayaker version of the mail survey that asked respondents to evaluate their most recent trips down the river during a two-hour release and during a longer water release (Table G-15).

For their most recent trip during a three-hour release, nearly all respondents found the number of both rafts (avg.=10) and kayaks (avg.=18) to be acceptable. In contrast, for their most recent trip during a two-hour release, kayakers reported seeing higher numbers of both rafts (avg.=16) and kayaks (avg.=19) on the river, and only 54% considered the number of rafts to be acceptable. Overall trip satisfaction was significantly higher during the three-hour release than during the two-hour release.

In response to what they liked best and least about their trips under varying water releases, the most common response to what kayakers liked best during the three-hour release was that it was not overcrowded, while the most common thing they liked least was the weather. For the two-hour release, the most common high point was the rapids, and the least liked feature again was the weather.

In this case, the two-hour releases considered had occurred during the late summer of 1988 when natural flows were very low, so respondents were evaluating the most limited water conditions found on the Upper Yough. These results corroborate the findings shown earlier and lend further credence to the conclusion that the quality of boating on the Upper Yough declines significantly under high density conditions during two-hour releases.

Table G-15. Kayaker Responses to Numbers of Boats Seen Under Varying Water Releases During 1988

	Two-Hour Release (n=120)	Three-Hour or Longer Release (n=197)
Number of rafts seen		
5 or less	22%	44%
6 - 10 rafts	16%	22%
11 - 20 rafts	35%	22%
More than 20 rafts	27%	12%
Average	16 rafts	10 rafts
Percent reporting number of rafts was acceptable	54%	87%
Number of kayaks seen		
10 or less kayaks	25%	34%
11 - 20 kayaks	41%	40%
21 - 30 kayaks	22%	16%
More than 30 kayaks	12%	10%
Average	19 kayaks	18 kayaks
Percent reporting number of kayaks was acceptable	90%	96%
Overall trip satisfaction		
Perfect (1)	10%	19%
Excellent (2)	29%	61%
Very Good (3)	32%	14%
Good (4)	17%	5%
Fair (5)	9%	2%
Poor (6)	3%	0%
Average	3.0	2.1

Preferences for Management Alternatives

Study subjects were asked to indicate the extent to which they supported or opposed a variety of potential management actions (Table G-16). Youghiogheny River boaters generally tended to support the idea of limiting river use in some way. The majority of both rafters and kayakers were opposed to the development of more public access points. A slight majority of both rafters and kayakers supported the notion of providing hiking trails along the river. Both groups tended to be indifferent to the idea of increasing fish stocking efforts. Rafters and kayakers differed markedly, however, in their responses to most of the other management actions considered.

Rafters. The majority of rafters in the study felt that there was no need for more controls to prevent user conflicts or environmental damage. More than two-thirds of the rafters sampled, however, supported the notion of limiting the number of rafts allowed on the river at any one time. Only 44 percent favored limiting the number of kayaks. Rafters also strongly favored the idea of scheduling trips to achieve better spacing between groups. In general, rafters were not strongly opposed to any of the management alternatives presented.

Kayakers. Most (67%) kayakers felt that there was no need for further controls to prevent environmental damage, but half of them felt that more controls were needed to prevent user conflicts. Not surprisingly, kayakers generally expressed stronger support for limiting the numbers of rafts and commercial users on the river. They also tended to oppose limits on the numbers of kayaks and private users. Kayakers showed much stronger support for limiting the number of commercial companies offering guided trips, but they were less supportive than rafters of aggressive enforcement of safety rules and regulations.

Kayakers' responses to the potential actions listed in Table G-16 appeared to reflect a greater degree of vested interests than did those of rafters. That is, kayakers seemed to be saying, limit the numbers of rafts and commercial river users, but leave us alone. Rafters' were more likely to support restrictions on both commercial and private use of the river.

The visitor surveys employed in this study also asked some direct questions about the numbers of boats that should be allowed on the Upper Youghiogheny. The 1989 mail survey asked respondents their opinions about the maximum number of rafts and kayaks that should be allowed on the river, given the conditions present on the day of their sampled trip (Table G-17). A few respondents wrote in that there should be no limits on the numbers of boats allowed in the river. Most boaters, however, did indicate the maximum numbers they felt should be allowed.

Rafters reported average limits of 22 to 25 rafts and 25 to 32 kayaks. Rafters' responses showed little difference in relation to the length of the water release on the day of their trip. Those running the river during two-hour releases tended to recommend slightly higher limits than those on the river during longer releases. This unexpected pattern may reflect the relatively high water levels present during two-hour releases this year, or it may reflect a relative lack of sensitivity to varying water conditions among commercial rafting customers, as discussed earlier.

Table G-16. Boater Responses to Various Potential Management Actions
(Percentage of Boaters; n=630 Rafters and 276 Kayakers)

		Strongly Support	Support	Undecided	Oppose	Strongly Oppose
Provide more points of public access to the river	Rafters	8	15	23	34	21
	Kayakers	17	16	13	27	28
Limit the size of groups running the river*	Rafters	19	46	20	12	4
	Kayakers	12	30	20	21	17
Provide hiking trails along the river	Rafters	11	42	23	18	6
	Kayakers	12	39	20	18	11
Limit the number of kayaks allowed on the river at any one time*	Rafters	8	36	25	23	8
	Kayakers	4	15	16	30	35
Limit the number of rafts allowed on the river at any one time*	Rafters	16	54	15	13	3
	Kayakers	34	41	11	9	5
Limit the total number of people on the river at any one time*	Rafters	14	51	17	14	4
	Kayakers	6	26	26	25	18
Limit the number of commercial users (including guides and customers) on the river at any one time*	Rafters	16	49	17	14	4
	Kayakers	34	42	12	8	5
Limit the number of private (non- commercial) visitors on the river at any one time*	Rafters	14	39	21	18	8
	Kayakers	4	16	19	26	35
Increase fish stocking efforts	Rafters	12	28	50	7	3
	Kayakers	13	25	52	8	2
Limit the number of commercial com- panies offering guided trips*	Rafters	18	38	21	18	5
	Kayakers	41	31	15	8	6
Require scheduling of trips to achieve better spacing between groups*	Rafters	24	49	17	7	3
	Kayakers	26	34	16	15	10
Provide aggressive enforcement of safety rules and regulations*	Rafters	27	44	18	8	4
	Kayakers	16	29	19	19	17

*Difference between rafters and kayakers significant at the .01 level.

Table G-17. 1989 Boater Responses to the Number of Boaters That Should be Allowed on the River, by Length of Release on the Day of Their Trip

	Maximum Number of Rafts			
	Rafters		Kayakers	
	Two-Hour Release (n=148)	Three Hour or Longer Release (n=77)	Two-Hour Release (n=21)	Three-Hour or Longer Release (n=10)
10 rafts or less	28%	36%	33%	0%
11 - 20 rafts	34%	32%	29%	20%
21 - 30 rafts	18%	14%	24%	80%
31 - 40 rafts	6%	5%	10%	0%
More than 40 rafts	14%	12%	5%	0%
Average	25 rafts	22 rafts	20 rafts	26 rafts
Percent suggesting no limit	0%	4%	0%	0%

	Maximum Number of Kayaks			
	Rafters		Kayakers	
	Two-Hour Release (n=142)	Three Hour or Longer Release (n=74)	Two-Hour Release (n=19)	Three-Hour or Longer Release (n=10)
20 kayaks or less	64%	62%	14%	0%
21 - 40 kayaks	20%	22%	36%	20%
41 - 60 kayaks	9%	10%	36%	40%
More than 60 kayaks	8%	6%	14%	40%
Average	32 kayaks	25 kayaks	49 kayaks	73 kayaks
Percent suggesting no limit	3%	4%	26%	0%

Kayakers differed from rafters in two ways regarding their opinions about limits on the number of boats that should be allowed on the river. First, they suggested that, if there were to be limits on the number of kayaks allowed on the river, the limit should be two to three times higher than the number of rafts allowed. Second, kayakers' responses did vary in relation to the length of the water release during their trip. They suggested higher limits for both rafts and kayaks when the water release was three hours or longer.

The numbers of kayakers represented in Table G-17 are small because relatively few kayakers were included in the 1989 visitor survey. Supporting evidence is again found, however, in responses to some questions that were included in the 1988 kayaker survey. In this case, kayakers were asked directly about the number of boats that should be allowed on the river under varying water conditions (Table G-18). Respondents suggested an average of 20 rafts during a two-hour release, and 29 to 30 rafts under longer releases or when natural flow is high enough to run the river. With respect to the maximum numbers of kayaks, they reported an average of 43 during two-hour releases and 57 to 58 during longer releases or navigable natural flow. It is noteworthy that there was little difference in the response to longer water releases and navigable natural flows. One exception to this finding was that a substantially higher percentage of respondents suggested that there be no limit on the number of rafts or kayaks when natural flow is navigable. These results reinforce the findings presented earlier and suggest that management of boating on the Upper Youghiogheny should recognize the river's varying capacity under varying water conditions.

Conclusions

The Upper Youghiogheny River is used for whitewater boating by two distinct user groups that are seeking different types of experiences and that evaluate their river experiences differently. This is not to say that there are no commonalities between the groups. Both commercial rafters and private boaters (kayakers) placed high importance on running the rapids and considered the Upper Yough to be more fun than other rivers they have run. Both groups generally reported high levels of satisfaction and were in favor of regulating boating on the river.

Many of the differences between rafters and kayakers seem to be related to varying levels of experience on the river. Most rafters were customers of commercial outfitters who were on their first trip on the Upper Yough. They were seeking thrills and excitement under the protective guidance of an experienced river guide. Most kayakers were expert paddlers with considerable experience on the Upper Yough. They too were seeking a challenge, but were also concerned with developing their skills, escaping crowds and enjoying the natural surroundings. It is not surprising that the kayakers were more sensitive to varying river conditions.

Results of the visitor surveys suggest several conclusions that are particularly relevant to the assessment of the capacity of the Upper Youghiogheny for whitewater boating. First, boaters sampled between August 1988 and August 1989 were generally very pleased with their boating experiences. Thus, *under the conditions that occurred during this period*, the numbers of boaters using the river generally do not appear to have been above the social capacity. Secondly, the quality of the boating experience on the Upper Youghiogheny is related to the number of people using the river. The relationship between quality and density is not a

Table G-18. Kayaker Responses to the Number of Boaters That Should be Allowed on the River Under Varying Flow Conditions

	Maximum Number of Rafts During:		
	Two-Hour Release (n=130)	Three-Hour or Longer Release (n=120)	Navigable Natural Flow (n=63)
10 rafts or less	25%	8%	13%
11 - 20 rafts	43%	30%	29%
21 - 30 rafts	23%	31%	25%
31 - 40 rafts	5%	16%	16%
More than 40 rafts	5%	15%	17%
Average	20 rafts	30 rafts	29 rafts
Percent suggesting no limit	4%	7%	26%

	Maximum Number of Kayaks During:		
	Two-Hour Release (n=110)	Three-Hour or Longer Release (n=97)	Navigable Natural Flow (n=50)
20 kayaks or less	11%	5%	18%
21 -40 kayaks	46%	24%	8%
41 - 60 kayaks	27%	34%	28%
More than 60 kayaks	16%	37%	46%
Average	43 kayaks	57 kayaks	58 kayaks
Percent suggesting no limit	12%	17%	32%

simple one, however. This relationship is intertwined with water release conditions such that problems are found only when high raft densities occur on two-hour water releases. Finally, current users of the Upper Youghiogheny tend to support the regulation of whitewater boating on the river, although rafters and kayakers differ considerably in their reactions to specific proposed management alternatives. The implications of these findings are discussed at greater length in Section I of this report.

Section H

Landowner Survey Results

Introduction

The regulation and management of private lands by governmental agencies necessitates that landowners within the regulated area have the opportunity to periodically provide their input into the management decision-making process. There are a number of ways in which this input can be made. These methods range from written comments and letters to public hearing testimony.

In the case of the Youghiogheny Scenic and Wild River corridor, landowners have had the opportunity to provide testimony at several public hearings, and to send written comments on proposed regulations and management plans to the Maryland Department of Natural Resources. Landowners also are represented on the Youghiogheny Scenic and Wild River advisory board. While these forms of public involvement are very beneficial (and often mandated by law), some landowners may not have availed themselves of these opportunities for various reasons. Further, the types of information conveyed through these various public involvement techniques is often limited by the amount of time an individual has to speak or how much time the individual has available to develop written comments. As a result, information received is often related to broad issues or a few specific components of regulations. Landowner views on a wider range of concerns and more detailed information on specific topics is often necessary for decision-makers to have a more complete understanding of how property owners use their land and what their opinions and preferences are about the regulations affecting their land.

Collecting this type of information becomes more problematic when there is a significant absentee owner component or landowners are reluctant to become involved in the hearings and advisory board meetings or to provide written comments. One way to collect useful information from landowners, which overcomes many of the problems of other public involvement tools, is to use a mail survey technique and questionnaire. This procedure ensures that all property owners have the opportunity to provide information and feedback to the sponsoring agency on a wide range of concerns of both the agency and the individual landowner.

An important component of this Youghiogheny River Scenic and Wild River study was to develop an understanding of how land within the corridor was currently being used, what landowners felt were the most serious problems in the corridor, and how they felt the corridor could be managed most effectively. To collect this information and ensure that all landowners had an opportunity to provide their input, we conducted a mail survey of all Youghiogheny Scenic and Wild River Corridor landowners. Specific objectives of this survey were:

1. To understand the residence patterns of landowners.
2. To develop an understanding of how private lands were used in the corridor.

3. To assess the types of recreational activities occurring on private lands and the extent to which they were engaged in.
4. To determine the nature and extent of conflicts between landowners and recreational users.
5. To elicit landowner views on the environmental quality of the river and corridor.
6. To obtain landowner evaluations of the effect the Scenic and Wild River designation has had upon their property values.
7. To obtain landowner views about how the Youghiogheny Scenic and Wild River Corridor should be developed and managed.

Survey Procedures

A list of landowner names and addresses was obtained from the Maryland Scenic and Wild Rivers Program. Each of the 76 property owners on the list was sent a questionnaire which contained a series of specific questions seeking information related to the study objectives listed above. An initial mailing was sent to all landowners by first class mail. This mailing contained a cover letter explaining the purpose of the study and ensuring the confidentiality of individual responses. A postcard was sent to landowners two weeks after the initial mailing. The purpose of this mailing was to remind survey recipients of the importance of their response and encourage them to complete the questionnaire and return it to us. Two weeks after the postcard reminder, a second full mailing was sent to all landowners whose questionnaire had not been returned. This mailing, sent by certified mail, consisted of a replacement questionnaire and a new cover letter which reflected the follow-up nature of the mailing and urged participation in the study. See Appendix 5 for copies of all materials used in the landowner survey.

Survey response statistics are provided in Table H-1. As seen in the table, five of the landowner addresses provided by the Scenic and Wild River Program were invalid. Our efforts to obtain more current addresses for these individuals were unsuccessful. Of the 71 landowners sent questionnaires, 70 percent returned their questionnaires. Six of the returned questionnaires had substantial portions of incomplete or missing information and thus were unusable for analysis purposes.

Table H-1. Summary of Landowner Mail Survey Response

Number of Landowners in the Survey	76
Invalid Addresses	5
Usable Addresses	71
Questionnaires Returned	50
Percentage of Questionnaires Returned	70%
Questionnaires Usable for Analysis	44
Percentage of Questionnaires Usable for Analysis	62%

The questionnaire was divided into five sections designed to collect information to address the study's objectives. The first section dealt with the nature and extent of recreational and commercial boating within the Scenic and Wild River Corridor. Landowners were asked to indicate how strongly they agreed or disagreed with 20 statements about recreational boating on the Youghiogheny River. Responses ranged from (1) Strongly Disagree to (5) Strongly Agree. In this section, landowners also were asked how they felt the value of their property has been changed since the designation of the Youghiogheny as a Wild and Scenic River.

In the second section, landowners reported how serious they felt 23 different problems and conflicts were on the river. Responses ranged from (1) Not a Problem to (5) Very Serious Problem. Also in this section, landowners were asked if they approved or disapproved of recreational boating on the river and whether or not they had used "no trespassing" signs to keep river users from crossing their land.

The third section dealt with river use management. Here landowners were asked about user and environmental conflicts and how they should be controlled. Landowners were also asked if they supported or opposed eight management tools that could be employed on the river. Responses to the eight alternatives ranged from (1) Strongly Support to (5) Strongly Oppose.

The fourth section focused on the provision of access to the river and various recreational access and facility development alternatives. Landowners were asked about how interested they were in providing access to the river through various mechanisms ranging from the sale or donation of an easement to the sale of all or part of their land to the state. Responses to these questions ranged from (1) Extremely Interested to (5) Not At All Interested. Landowners were also asked whether they supported or opposed the development of restrooms and dressing, picnicking, and parking facilities and hiking trails and who should provide these facilities.

The final section of the questionnaire asked landowners about various uses of their property. Information collected included reasons for acquiring the property, current uses of the property, and recreational activity occurring on the property.

In addition to the above information, there were numerous unstructured, open-ended questions where landowners could express their opinions and feelings on the above and other unrelated topics. These responses were incorporated into the discussion of results presented on the following pages.

Results

Residence Patterns

The results of the Youghiogheny Scenic and Wild River Landowner Survey are presented in seven parts following the objectives of the study. The first objective of the study was to understand the residence patterns of corridor landowners. Several questions were used to probe the current and future residence status of lands located within the corridor. Nearly all (90%) of the landowners made Maryland their permanent residence. The few non-residents lived in California, Florida, Pennsylvania, and West Virginia.

A majority of the corridor landowners residing within Maryland (63%) lived in Garrett County. The remaining individuals lived in one of seven other Maryland counties including Baltimore, Prince Georges, Calvert, Montgomery, Carroll, Howard, and Anne Arundel.

Fifty-six percent of the landowners reported that there was a house on their property. Of the properties with houses, 54 percent of the landowners reported that they lived year round in the house; 31 percent said they lived in the house seasonally; and 15 percent said they did not live in the house. Of the landowners who reported not currently living in the house on their property or who reported no house on their property, 50 percent indicated that they planned to live permanently on the land in the future.

Land Use Characteristics

The second objective of the study was to develop an understanding of how private lands in the corridor were being used. To obtain this information, landowners in the survey were asked to report what the major purpose of obtaining their property was and what percentage of their land was in various uses. Landowners reported that they obtained their property principally for residential (37%) and recreational (22%) purposes. Commercial use (17%) and investment (17%) were other important reasons for acquiring the property while 7 percent cited other reasons.

As seen in Table H-2, two-thirds of the privately owned land along the river is in woods. About one-fifth is in open space and only 10 percent is used for residential purposes. Very little of the property along the river is used for agricultural purposes.

Landowners in the Youghiogheny River corridor used their land for a variety of recreational purposes as seen in Table H-3. Using the land for general fun and enjoyment was the most prevalent recreational use among landowners. About half of the landowners used their land for hunting and 44% used the access their land provided to the river for fishing. The number of days during 1988 that landowners participated in hunting and fishing averaged around fifteen.

Table H-2. Percentage of Landowner Property in Various Uses

Land Use	Average Percentage	Percentage Range
Woods	67%	0 - 100%
Open Space	17%	0 - 95%
Residential	10%	0 - 70%
Pasture	4%	0 - 45%
Cropland	3%	0 - 60%
Other	<1%	0 - 10%

Table H-3. Average Number of Days Landowners Used Their Property For Various Recreational Activities During 1988

Activity	Average Days	Range of Days	Percent of Landowners
Fun and Enjoyment	62	0 - 365	58%
Fishing	14	0 - 150	44%
Hunting	14	0 - 90	50%
ATV Riding	14	0 - 360	17%
Boating	11	0 - 180	11%
Camping	2	0 - 45	17%
Snowmobile Riding	1	0 - 10	8%

We also asked the landowners whether or not they had boated some portion of the Yough. About 11 percent of the landowners indicated that they had previously been boating on the river. Only five percent reported having boated the wild section of the river between Sang Run and Friendsville.

Landowner and River User Conflicts

One of the main concerns of landowners over the years has been the alleged unacceptable behavior of recreational users of the river. User conflicts with landowners have taken many forms. There have been reports of conflicts between landowners and whitewater boaters (the principal recreational river user group) and conflicts between different recreational user groups (e.g., rafters and kayakers). These conflicts heretofore have not been documented so the nature and extent of these conflicts is unknown. Objective four of this study dealt

with identifying the nature and extent of the conflicts between landowners and river users from the landowners' perspective.

To address this objective, we asked landowners the extent to which they agreed or disagreed with several statements about recreational users of the river. They also rated the degree of seriousness of various problems along the river. As seen from Table H-4, a majority of the landowners disagreed or strongly disagreed with the statement that there was a lot of recreational boating occurring near their property. Nearly three-fifths of the landowners reported that recreational boating by their property had increased over the past five years. Three-fourths of the landowners reported that they have not had any problems with recreational boaters. However, more than half of the landowners knew other landowners who have had problems with boaters. Many of these landowners may be referring to the same individuals or incidents since such a high percentage reported having no problems with boaters personally. Most landowners were undecided or disagreed that they have had some nice talks with boaters. About one-fourth of the landowners felt boaters were not considerate people. Over 40 percent of the landowners felt that boaters from outside the area were the cause of problems in the area while half were undecided on this statement.

Table H-4. Landowner Perceptions of Conflicts with River Users
(Percentage of Landowners; n=44)

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Average
There is a lot of recreational boating near my property	18	34	11	21	16	2.8
Many more recreational boaters pass by on the Yough now than five years ago	11	19	14	33	23	3.4
Personally, I have had no trouble with recreational boaters	14	7	2	60	17	3.5
Most recreational boaters are considerate people	7	21	33	37	2	3.1
I've had some nice talks with the recreational boaters using the Yough near my land	15	29	34	20	2	2.7
People I know who live along the Yough say they have trouble with recreational boaters	3	19	26	31	21	3.6
Boaters from outside this area cause the problems	7	2	49	21	21	3.5
Boaters often cross my land without permission	24	37	12	12	15	2.6
I would allow boaters to cross my land if they asked permission	37	29	15	12	7	2.2
Recreational boaters should be allowed to use any river in the state	34	18	18	25	5	2.5
Recreational boaters should be allowed to use any navigable river in the state	14	16	21	40	9	3.1

Only 27 percent of the landowners reported that recreational boaters crossed their land without permission. However, few landowners would consent to boaters crossing their land even if permission were asked.

Thirty percent of the landowners felt that boaters should be allowed to use any river in the state while 52 percent disagreed with this statement. Landowner opinions changed substantially when asked if boaters should be allowed to use any navigable river in the state. Here, half agreed that they should and 30 percent said that they should not.

Landowners were asked how serious several potential problems were on lands along the river (Table H-5). As can be seen from the table, several of the items were considered serious or very serious problems by some landowners. Problems rated as most serious by landowners were trespassing, vandalism, invasion of privacy, and too many boaters. Even for these problems, however, the majority of landowners surveyed did not consider the problems serious.

Table H-5. Types and Seriousness of River User Problems Reported by Landowners
(Percentage of Landowners; n=44)

Type of Problem	Not a Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem	Average
Trespassing	10	15	28	15	32	3.5
Invasion of Privacy	16	18	21	21	24	3.2
Vandalism	19	11	25	17	28	3.2
Too many boaters	16	22	24	19	19	3.0
Driving on wet fields	32	12	18	18	20	2.8
Rudeness of river users	32	26	8	21	13	2.6
Improper use of guns	29	26	20	11	14	2.6
Too much hunting	42	14	22	14	8	2.3
Cutting of fences	49	20	3	14	14	2.3
Drunkenness	33	36	8	15	8	2.3
Boater nudity	61	11	8	6	14	2.0
Bothering livestock	65	15	6	11	3	1.8
Too many fishermen	61	18	18	3	0	1.6

Less serious but still a significant problem to nearly 40 percent of the landowners was people driving on wet fields. Also in the slight to moderately serious range were problems related to rudeness of river users and improper use of guns. Items that generally were rated as no problem by landowners were boater nudity, bothering livestock, too many fishermen, cutting of fences, too much hunting, and river user drunkenness.

In two related questions, landowners were asked if their property had ever been deliberately destroyed by river users and whether or not they had put up "no trespassing" signs to keep river users from crossing their land. Only 20 percent of the landowners indicated that their property had deliberately been destroyed by river users during previous years. The types of property damage reported by land owners were diverse and included littering, vandalism, breaking and entering, making campfires and camping, and cutting trees. On the other hand, 38 percent of the landowners had erected "no trespassing" signs to keep river users off their land.

Landowners were asked if they felt more controls were needed on the Yough to prevent conflicts from occurring between landowners and river users. Half of the landowners said "yes" there should be more controls to better manage the river. When asked what user/landowner conflicts needed to be managed, trespassing was mentioned by half of the landowners wanting more management control. Controlling vandalism, litter, and limiting boaters were each mentioned by about 5 percent of the landowners. These results reinforce those presented earlier in Table H-5. River landowners are principally concerned about protecting their privacy and property rights.

When asked if they felt more controls were needed on the river to prevent conflicts from occurring between river users, only 29 percent of the landowners responded in the affirmative. Landowners were asked to list the conflicts that needed to be controlled; preference to local outfitters, limiting commercial rafting days, limiting boaters, providing state access to the river, and fighting in boats were all mentioned. There was no consensus on the identification of conflicts as each conflict listed above was mentioned by only one or two landowners.

When asked for their overall opinion about recreational boating on the Upper Youghiogheny, the most common response from landowners was that they were neutral or indifferent to it (38%). Those who did have an opinion were more likely to disapprove than to approve of recreational boating. Nearly one-fourth (24%) strongly disapproved, while another 14 percent disapproved of recreational boating on the Upper Yough. In contrast, only 17 percent of landowners approved of recreational boating, with another 7 percent strongly approving.

Perception of Environmental Quality

The fifth objective of the study was to elicit landowner views on the environmental quality of the river and corridor lands. As with recreational boaters in the previous section, landowners were asked to rate the seriousness of several environmental problems in the river corridor area. As seen from Table H-6, litter was viewed as the most serious problem on land and in the water. Again, however, the majority of landowners did not consider litter to be a serious problem. Fires, the improper disposal of human wastes, trampled vegetation,

disturbance of wildlife, and river bank erosion were all viewed as slightly to moderately serious problems. Tree cutting, muddy water, and logging were all seen as no problem at the present time by most landowners.

Table H-6. Types and Seriousness of Environmental Problems Reported by Landowners
(Percentage of Landowners; n=44)

Type of Problem	Not a Problem	Slight Problem	Moderate Problem	Serious Problem	Very Serious Problem	Average
Litter on the bank	13	13	26	13	35	3.5
Litter in the river	15	25	15	15	30	3.2
Fires	31	19	17	11	22	2.8
Improper disposal of human wastes	33	17	10	25	15	2.8
Trampled vegetation on banks	30	27	11	16	16	2.6
Disturbing wildlife	32	21	21	16	10	2.5
Erosion of river banks	30	14	32	14	10	2.6
Cutting of trees	49	21	13	3	14	2.1
Muddy water	51	22	13	11	3	1.9
Logging	62	14	19	5	0	1.7

Landowners were asked if they felt that more management controls were needed on the Yough to prevent the environment from being damaged by recreational users. Sixty percent of the landowners agreed that there should be more environmental controls. When asked, in an open response format, what kinds of environmental damage need to be controlled, landowners reiterated the previous findings of litter and trash. Tree cutting, soil erosion, fires, and scaring wildlife each were mentioned by four or five landowners.

Most of the environmental problems rated as moderately to very serious by a significant number of landowners could be attributed to recreational users of the river. However, bank and river litter, which were viewed as the most serious problems, can have their source from indiscriminate garbage dumping along the Yough and its tributaries and being washed downstream from outside the Scenic and Wild River section. Regardless of its source, litter is the most common environmental problem in the corridor according to the landowners.

Property Value Changes

The sixth objective of the study was to obtain landowner evaluations of the effect the Scenic and Wild River designation has had on their property values. When asked whether the designation has caused their property values to increase, remain the same, or decrease over the years, 24 percent of the landowners responded that their property value had increased because of the designation. Forty-three percent reported that the value had remained the same and 33 percent said it had declined. The most common reason given for property values being lowered was that the designation restricted the uses of the land. A few people thought that the state might "take" the land. Reasons given for increases in value were that adjacent lands were protected from development and the attractiveness of the designation itself.

Views About Development And Management

The final objective of the study was to obtain landowner views about how the Youghiogheny River should be managed and developed. To address this objective, we asked landowners several questions about the provision of river access and their support or opposition to various types of development. To begin this section, we asked landowners if they felt that any state or other governmental agency needs to manage the Youghiogheny River. Forty-four percent of the responding landowners said "yes" and 56 percent said "no". When asked which agency should be responsible for management, most of the landowners supporting management thought the State of Maryland should. The remaining landowners thought the county or federal governments should be responsible for river management.

Two-thirds of the landowners surveyed disagreed with the statement that people who own land along the Yough are the only ones who should be allowed to use it. The majority also felt that they do *not* have the right to stop people from using the river as it flows past their property. Most landowners do feel, however, that the state should not concern itself with how people use their own private land. Youghiogheny River landowners tend to not trust state government and, to a lesser extent, do not trust local government either. The majority feel strongly that the use of land should be determined by those who own it. On the other hand, the majority of landowners also support government efforts to keep rivers in their free-flowing condition. Landowners were almost evenly split in their opinions about government programs to protect scenic rivers in general, and the decision to make the Yough a wild and scenic river in particular.

With regard to the provision of river access, river landowners were asked if they allowed access to and from the river across their property and, if so, to whom. The majority of the landowners (53%) gave people they personally know access to the river. Only 11 percent of the landowners allowed people they do not know to have access to the river and 42 percent said they did not give anyone access to the river. Less than ten percent of the landowners indicated that they received some sort of payment for allowing access to the river. The people paying for the access were generally commercial river outfitters.

Table H-7. Landowner Feelings About Wild and Scenic River Preservation and Individual Property Rights (Percentage of Landowners; n=44)

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Average
People who own land along the Yough are the only ones who should be allowed to use it	11	55	9	7	18	2.6
As a landowner, I have the right to stop people from using the Yough as it flows past my property	14	44	16	16	10	2.6
The state government in Annapolis should not concern itself with how people use their land	14	16	9	27	34	3.5
Generally speaking, I can trust local government to do what is right	25	30	18	25	2	2.5
Generally speaking, I can trust state government in Annapolis to do what is right	46	32	11	11	0	1.9
The use of the land should be determined by the person or persons who own it	5	2	2	35	56	4.3
Government should make every effort to keep rivers in their free-flowing condition	7	10	15	32	36	3.8
In general, government should take steps to protect the scenic values of lands along rivers like the Yough	26	14	12	32	16	3.0
The state did the right thing when they decided to make the Yough a scenic and wild river	23	12	21	26	18	3.0

Landowners were asked if they would be interested in the sale or donation of an access easement, term lease of an easement, access permits, or the sale of all or part of their land to the state. Landowners could provide responses ranging from not at all interested to extremely interested. All access provision options were of no interest to most landowners. Fourteen percent of the landowners said they were somewhat or very

interested in the sale of an easement to the state. About one-fourth of the landowners were somewhat interested in the sale of all or part of their land to the state.

In terms of support for various types of development in the river corridor, less than one-third of the landowners supported the development of any of the facilities listed in Table H-8. Slightly less than half of all landowners strongly opposed all of the facilities.

Table H-8. Landowner Support for Various River Recreational Facilities
(Percentage of Landowners; n=44)

Type of Facility	Strongly Support	Support	Undecided	Oppose	Strongly Oppose	Average
Parking	8	23	13	10	46	3.7
Restrooms	10	17	13	13	47	3.7
Picnicking	5	21	15	10	49	3.8
Hiking Trails	8	21	15	8	48	3.7
Dressing Facilities	5	10	21	15	49	3.9

Landowners were also asked who should provide the facilities listed in Table H-8. Responses by those landowners supporting the development of the facilities were divided into the following three categories: about half thought that the state should provide the facilities; one-fourth thought Garrett County should provide them; and one-fourth felt that they should be provided by the private sector.

The degree of support by landowners for various management alternatives for the river was also sought from riparian landowners. As seen in Table H-9, any management actions that would restrict use of the river, enhance river resources such as fisheries, or provide greater enforcement of rules and regulations were highly supported by landowners. Those management actions providing for greater river user access or facility development were generally strongly opposed.

Comparing Selected Segments of the Landowner Population

Further analyses were conducted to determine whether various segments of the landowner population differed in their attitudes and opinions about river use and management. The first analysis involved comparing the attitudes and opinions of property owners who reside in Garrett County with those residing outside of the county. No significant differences were found for any of the types of variables included in the survey.

Secondly, the attitudes and opinions of property owners who live on their land during the entire year were compared to those who do not live on the property or who live there only part of the year. Again, no significant differences between these groups were found.

Table H-9. Landowner Support for Various River Management Alternatives
(Percentage of Landowners; n=44)

Type of Management Action	Strongly Support	Support	Undecided	Oppose	Strongly Oppose	Average
Provide aggressive enforcement of safety rules and regulations	55	23	18	2	2	1.7
Limit the number of commercial companies offering guided trips	48	35	10	7	0	1.8
Increase fish stocking efforts	54	22	17	7	0	1.8
Limit the size of groups running the river	48	28	20	2	2	1.9
Limit the total number of people on the river at any one time	41	23	28	3	5	2.1
Provide fencing to protect livestock and prevent trespass	33	18	13	8	28	2.8
Provide more points of public access to the river	15	15	13	7	50	3.6
Provide hiking trails along the river	10	18	10	10	52	3.7

Finally, survey responses were broken down to determine if landowners living closer to the river (500 feet or less) responded differently than those living farther away from the river (over 500 feet). No significant differences between these two groups were found. These analyses, combined with further comparisons of those owning land at different points along the river corridor, suggest that landowners' attitudes and perceptions of the Upper Yough are not related to the location and characteristics of their property.

Conclusions

In general, landowners showed mixed reactions to the Scenic and Wild River designation of the Youghiogheny River. Most landowners felt that they should be able to use their property as they wished, and that the state has no business "meddling in their affairs." By the same token, landowners were concerned about the environmental quality of the river area and wanted to see the river remain in its natural condition.

Most of the landowners were not opposed to recreational boating on the river. Although they have noted the increase in boating levels during recent years, most landowners reported that they have not personally had any problems with recreational boaters. On the other hand, about half of the landowners felt that more controls were needed to prevent conflicts between landowners and whitewater boaters, and sixty percent felt more controls were needed to prevent environmental damage within the corridor.

The main themes underlying most landowner responses were that they highly value their privacy and want to be able to use their land as they see fit. Landowners generally do not mind others using the river, as long as the river users respect their private property rights. Landowners also expressed strong sentiment for maintaining the wild and primitive character of the Upper Youghiogeny River Corridor. Most were opposed to the development of any additional recreational facilities and in favor of any management actions that would control whitewater boating activity on the river.

The viewpoints of corridor landowners have been taken into consideration in the development of the recommendations presented in this document. Landowners' views must be balanced with those of other interest groups. The following recommendations are warranted, however, on the basis of the results of the landowner survey. First, any proposed development or management action by the State should include landowner input prior to implementation. While the mechanism for this input already exists via the Youghiogeny River Advisory Board, special efforts should be made to ensure that any new actions are designed to prevent trespassing and invasion of landowners' privacy. Secondly, greater efforts need to be made by MDNR to educate river users about the private property rights of riparian landowners. This educational effort should be integrated with the minimum impact education discussed in the environmental impact section of this report (p. E-16). The problems of trespassing and invasion of privacy may be reduced substantially by making more river users aware of their rights and those of adjacent landowners.