

# **Caribbean National Forest\***

## **Wild and Scenic Rivers**

### **Comprehensive River Management Plan**



**\*Forest name changed to El Yunque National Forest in Mar. 2007**

United States  
Department of  
Agriculture

Southern Region  
Forest Service

Caribbean  
National Forest



Responsible Official:	Pablo Cruz, Forest Supervisor El Yunque National Forest HC 01 Box 13490 Rio Grande, Puerto Rico 00745
For Information:	José R. Ortega, Recreation Program Leader & El Portal Director El Yunque National Forest HC 01 Box 13490 Rio Grande, Puerto Rico 00745 (787) 888-5613
	or
	Carolyn Pabon, Planning & Administrative Team Leader El Yunque National Forest HC 01 Box 13490 Rio Grande, Puerto Rico 00745 (787) 888-5665
Submit Comments to:	CRMP Comments El Yunque National Forest HC 01 Box 13490 Rio Grande, Puerto Rico 00745 Tel. (787) 888-1810 FAX (787) 888-5685 <a href="http://www.fs.fed.us/r8/el_yunque">www.fs.fed.us/r8/el_yunque</a>

**Cover Photo – La Mina Fall**

***Finalization of the Comprehensive River Management Plan is contingent upon the Environmental Assessment Decision***

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

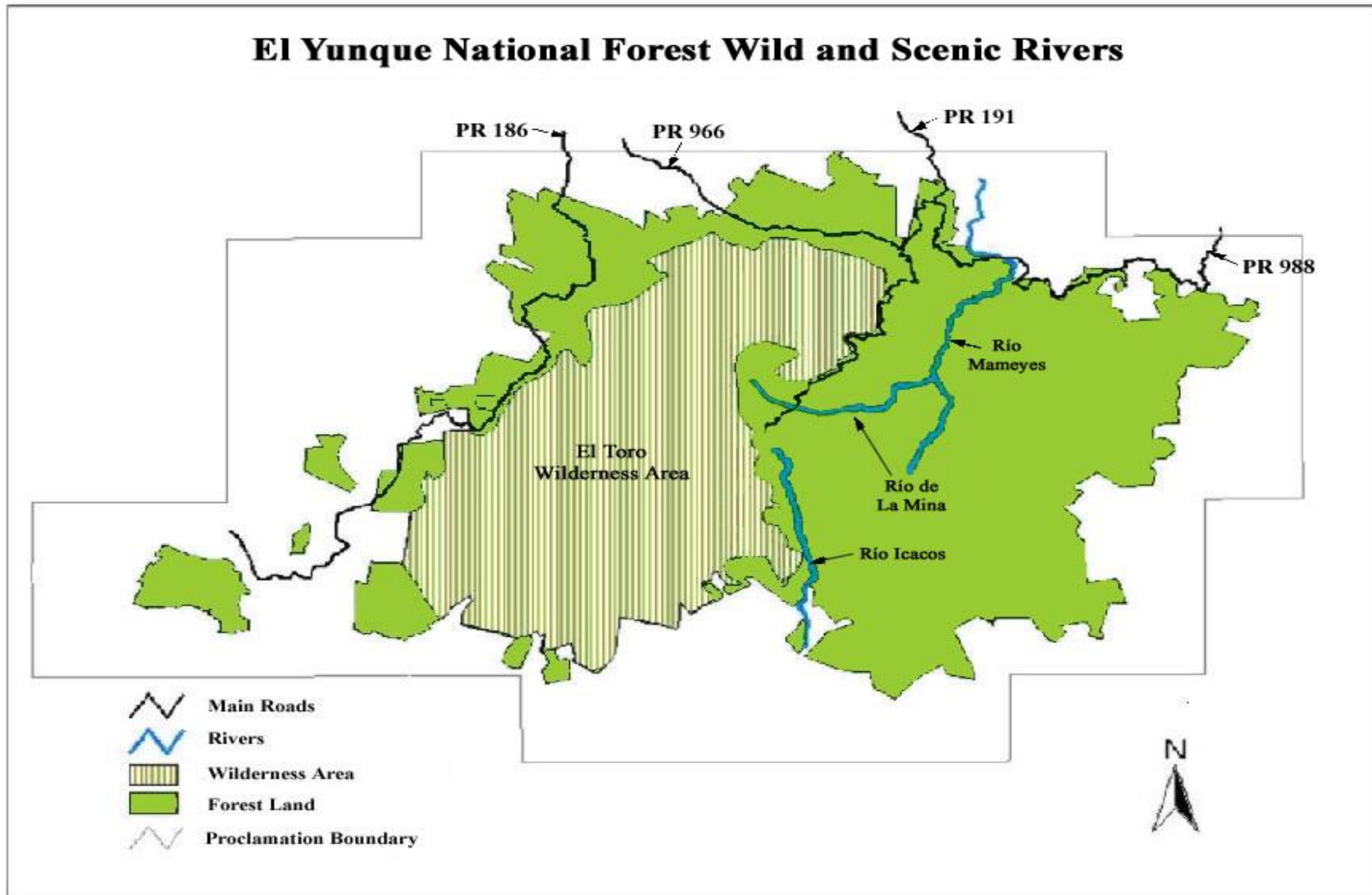
To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

# Table Of Contents

<b>CNF Wild and Scenic River Map</b> .....	<b>5</b>
<b>I. Introduction</b> .....	<b>6</b>
Purpose of the Comprehensive River Management Plan .....	6
Description Of The River Corridors .....	7
Land Ownership and Land-Use.....	8
Navigability and Riparian Rights .....	8
Free-Flowing Condition .....	8
Description of Outstandingly Remarkable Values .....	9
Wild and Scenic River Classifications .....	11
<b>II. Planning Context</b> .....	<b>15</b>
Caribbean National Forest Plan .....	15
Adequacy of Existing Regulations and Plans .....	15
How This Plan Will Be Implemented .....	15
<b>III. Management Direction</b> .....	<b>16</b>
Goals.....	16
General Direction and Standards .....	17
River Corridor Boundaries.....	27
<b>IV. Criteria for Implementation Priorities</b> .....	<b>28</b>
<b>V. Monitoring</b> .....	<b>29</b>
<b>Appendix A: Detailed Resource Descriptions for the River Corridors</b> .....	<b>32</b>
Physiography .....	32
Geology And Minerals .....	32
Soils .....	33
Stream-flow and Water Quality .....	35
Fish And Wildlife .....	37
Threatened And Endangered Species .....	38
Vegetation .....	40
Scenery.....	41
Human Modifications.....	42
Access.....	43
Recreational Activities.....	43
Historic And Cultural Resources .....	44

<b>Appendix B: Applicable Laws, Regulations, and Plans.....</b>	<b>45</b>
Section 7 of the Wild & Scenic Rivers Act.....	45
Section 10 and Section 404 Permits and Fish and Wildlife .....	46
Endangered Species Act.....	47
<b>Appendix C: List Of Implementation Priorities .....</b>	<b>48</b>
Guidelines .....	48
On-going Actions.....	48
Short-term Priority Actions .....	48
Long-term Priority Actions .....	48
<b>Appendix D: CNF Land and Resource Management Plan - Wild and Scenic River.....</b>	<b>49</b>
<b>Appendix E: CNF Land and Resource Management Plan - Management Area 9 .....</b>	<b>53</b>
<b>Appendix F: CNF Land and Resource Management Plan – Monitoring.....</b>	<b>57</b>
<b>Appendix G: List of Prepareres.....</b>	<b>58</b>

## El Yunque National Forest Wild and Scenic Rivers





## **I. Introduction**

The Wild and Scenic Rivers Act (WSRA) was passed in 1968 to “select rivers of the Nation which, with their immediate environments, possess Outstandingly Remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar value, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.” The intent of this law is to preserve the character of a river and keep it in a free-flowing condition, not to halt development or use of a river.

Congress designated portions of the Rio Mameyes, Rio de la Mina and Rio Icacos into the National Wild and Scenic Rivers (NWSR) through the Caribbean National Forest (CNF) Wild and Scenic Rivers Act of 2002 (**P.L. 107- 563 December 19, 2002** ) to the National Wild and Scenic River System. Rio Mameyes has a 2.1 miles Wild segment, a 1.4 mile Scenic segment and a 1.0 mile Recreation segment. Rio de la Mina has a 0.9 mile Recreation segment and a 1.2 mile Scenic segment. Rio Icacos has a 2.3 miles Scenic segment.

We note that the correct length of Rio Mameyes wild segment is 1.6 miles. This distance will be used in all documents.

### **Purpose of the Comprehensive River Management Plan**

Section 3(d)(1) of the Wild and Scenic Rivers Act states, “The federal agency charged with the administration of each component of the National Wild and Scenic Rivers System shall prepare a comprehensive management plan to provide for the protection of river values. The plan shall address resource protection, recreation development of facilities and user capacities and other management practices necessary or desirable to achieve the purposes of this Act. The plan shall be prepared, after consultation with State and local governments and the interested publics within three full years after the date of designation. Notice of completion and availability of such plans shall be published in the Federal Register and in a local newspaper. ”

This Comprehensive River Management Plan (CRMP) for the CNF Wild and Scenic Rivers is being developed by the US Forest Service and establishes

programmatic management direction for the river corridor for the next decade. This includes:

- Descriptions of the river settings and resource values
- Management direction including goals, desired future conditions and standards and guidelines to protect and enhance the Outstanding Remarkable Values (ORVs), free flow and water quality
- Management actions including a monitoring strategy to monitor conditions and ensure protection of the river corridors
- Implementation strategy for activities within the Wild and Scenic River corridors
- Description of River boundaries

The goals, standards, and guidelines are a statement of the Plan's management direction; however, the projected activities and rates of implementation are estimates and depend on site-specific analysis and the budgeting process.

### **Description Of The River Corridors**

The three rivers originate in the upper elevations of the CNF. The Rio Mameyes and Rio de la Mina flow in a northerly direction and have outstanding scenic, biological, geological, hydrological, recreation and historic value while the Rio Icacos flows in a southerly direction and has outstanding scenic, recreational, hydrological, historic and cultural values and ecological values. The Wild and Scenic River corridors are less than ¼ mile in width from each bank of the creek. The area within the corridors totals approximately 2,848 acres which are all National Forest System lands. This plan outlines management direction for the National Forest lands within the corridor.

The Rio Mameyes watershed covers 4,403 acres within the Forest, or 15.7% of the Forest. Water quality is optimum within the study area of the upper segment, since the entire corridor is located in the Baño de Oro Natural Area and no development exists. Due to steep slopes, no significant flood plains occur. There are approximately 73 acres of riparian wetlands along the Rio Mameyes segments. The Rio de la Mina is part of the Mameyes Watershed. The Rio de la Mina sub-watershed covers an area of 1720 acres which equals 6.2% of the Forest. The Rio Icacos watershed covers an area of 813 acres which equals 2.9% of the Forest.

The three rivers are very similar in that they all originate in the upper elevations of the Forest. There are large boulders along the shore and within the streams which make for many cascades and small waterfalls. The lush and varied vegetation that is found along the banks provide a very picturesque setting. Only the Rio Icacos has stream areas which are relatively flat with sand along the banks and the river bed. Appendix A contains a more detailed resource description of the River corridors.

### **Land Ownership and Land-Use**

There is a total of 8.4 miles of river in the three corridors (Rio Mameyes 4.0 miles, Rio de la Mina 2.1 miles and Rio Icacos 2.3 miles) and the entire distances are within National Forest System Lands. There is little evidence of human development and activities throughout much of the river corridors with the exception of some hiking trails and picnic shelters. The upper sections of the rivers, where the headwaters are located, are totally undeveloped forest lands made up of very dense tropical forest vegetation. The only exception is in the recreation segment of Rio de la Mina where the Palo Colorado Recreation area is located.

The recreation segment of the Rio de la Mina runs through the Palo Colorado Recreation Area which is one of the most developed recreation areas in the Forest. Developments at Palo Colorado include a state road with one river crossing, a developed recreation area with picnic shelters, toilets, parking, trails and VIS Center. There are also two CCC retaining pools, Baño Grande and Baño de Oro. Each have bathhouses which are not in use. Baño Grande site is open to the public but no swimming is allowed. Baño de Oro has been closed to the public for over 30 years.

### **Navigability and Riparian Rights**

The Forest Service retains authority to regulate the use of the rivers and National Forest lands on the shoreline whether segments are determined navigable or non-navigable. None of the three river's are navigable due to the steep slopes, shallow depths, waterfalls and large boulders that are found throughout the river bed and their banks. The head waters of all three rivers originate in the upper elevations of the Forest which means that the volume of water is very low and increases as it gets close to the forest boundary.

### **Free-Flowing Condition**

Free-flowing, as defined in Section 16(b) of the WSRA, is applied to "any river or section of a river," and means:

*"...existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway. The existence, however, of low dams, diversion works, or other minor structures...shall not automatically bar its consideration for inclusion..."*

The entire WSR segments of the three rivers are free-flowing, contain no dams, diversion structures, significant channeling or other modifications. There is a weir located on the Rio Icacos which is used to monitor water flow by researchers from the International Institute of Tropical Forestry and the University of Puerto Rico.



## **Description of Outstandingly Remarkable Values**

The diversity and distribution of outstandingly remarkable values (ORV's) throughout the river corridors and the high water quality create an overall high quality river environment of local and regional significance. The ORV's described tend to be similar for all three rivers unless specified by river and river segment. This is because of the distance of the rivers and their proximity to each other. The following values are those considered Outstandingly Remarkable for the three rivers:

**Scenic:** The streams and surrounding corridors have common characteristics. The river's through their swales have a moderate to steep gradient and rapid/pool flow characteristics with many cascades and small waterfalls. The swales are steep and wide with extensive exposed bedrock. The streambeds are rocky with numerous large boulders. The Rio Icacos is the exception which has a sandy base and shore lines along the upper segments of the river. In its lower segment it becomes steep with huge rock outcrops. The recreation segments of the Rio Mameyes from Angelito Trail to Puente Roto have various wading pools which are surrounded with large boulders. The river banks are lined with large native trees as well as tree ferns and Palms. In the Rio de la Mina recreation segment is located one of the most attractive waterfall found in the Forest. The La Mina Falls is the meeting point of two of the most used trails, La Mina Trail and Big Tree Trail. There are also two trails (Carillo and Bisley Trail) which are found along the scenic corridor of the Rio Mameyes. Both trails are primitive and are rarely used because of their challenging conditions and the little to no maintenance they receive.

**Recreational:** The major recreational experience is passive enjoyment of the natural environment, picnicking, wading in the water and hiking. Currents within the rivers are generally conducive to water play. The streams are relatively shallow and have easy access between the rocks and along the banks. The large boulders make the streams a good place for seating and cooling off. Recreation tends to be family activity oriented. Most of the river corridors are primitive with minimal human activity. Only 3.4 miles of trails (La Mina Trail, Big Tree Trail, Rio de la Mina Trail, a portion of La Coca Trail and Angelito Trail) are located within the corridors and use is concentrated along these trails and at the Palo Colorado Recreation area. Bird watching and nature photography are also very popular along the river corridors. Primitive camping is permitted, with proper permitting, along a closed segment of PR 191 which runs parallel to the Rio Icacos. The Puente Roto area, found along the recreation segment of the Rio Mameyes, has a large area for water play do to the rivers width at this point. There is an abundant amount of large boulders for people to sit and enjoy wading in the water. The area is used as an undeveloped recreation area but visitors enjoy wading in the water and picnicking along the banks of the river.

**Geologic:** Elevation on the Forest range from 100 feet at the northern boundary, to 3,533 feet at El Toro Peak. Terrain ranges from gentle slopes in low elevations to rugged side slopes exceeding 60% in higher elevations, where vertical rock-faced cliffs are numerous. On the Forest's north slopes, (Rio

Mameyes and Rio de la Mina) water courses drop rapidly at high elevations and more gradually below. The reverse is true on south slopes, (Rio Icacos) where most streams are less steep near their headwaters than further downstream. Geologic parent materials are of three basic types:

- Marine-deposited Cretaceous volcanic rocks, are the most wide spread.
- Tertiary intrusive quartz diorites, which occur on the south side of the Forest.
- Quaternary unconsolidated alluvial deposits (sand, gravels, silts and clays) occurring along mayor water courses.

***Fish and Wildlife:*** The fauna that is found along the river corridors is one of the most distinguishable communities in the entire island of Puerto Rico. Species exhibit traits unique only to tropical ecosystems. Aquatic, bird and terrestrial animal species on the Forest have many distinct characteristics that have evolved through interactions that promote specialization. Tropical rain forests have the greatest diversity of species of all communities (*Campbell, 1993*). The range of species includes over 127 terrestrial vertebrates, 77 bird species and 17 freshwater fish species. The CNF boast a spectacular degree of biodiversity in comparison to other National Forests. The Puerto Rican Parrot is seldom seen near the river corridors. The Parrots habitat is located within the El Toro Wilderness area. On rare occasions the parrot will go on early morning feed to areas within the Rio Icacos corridor on the south side of the forest. Wildlife can be observed and photographed in the tree tops, along the shoreline and in the water of the WSRs that are found in the forest.

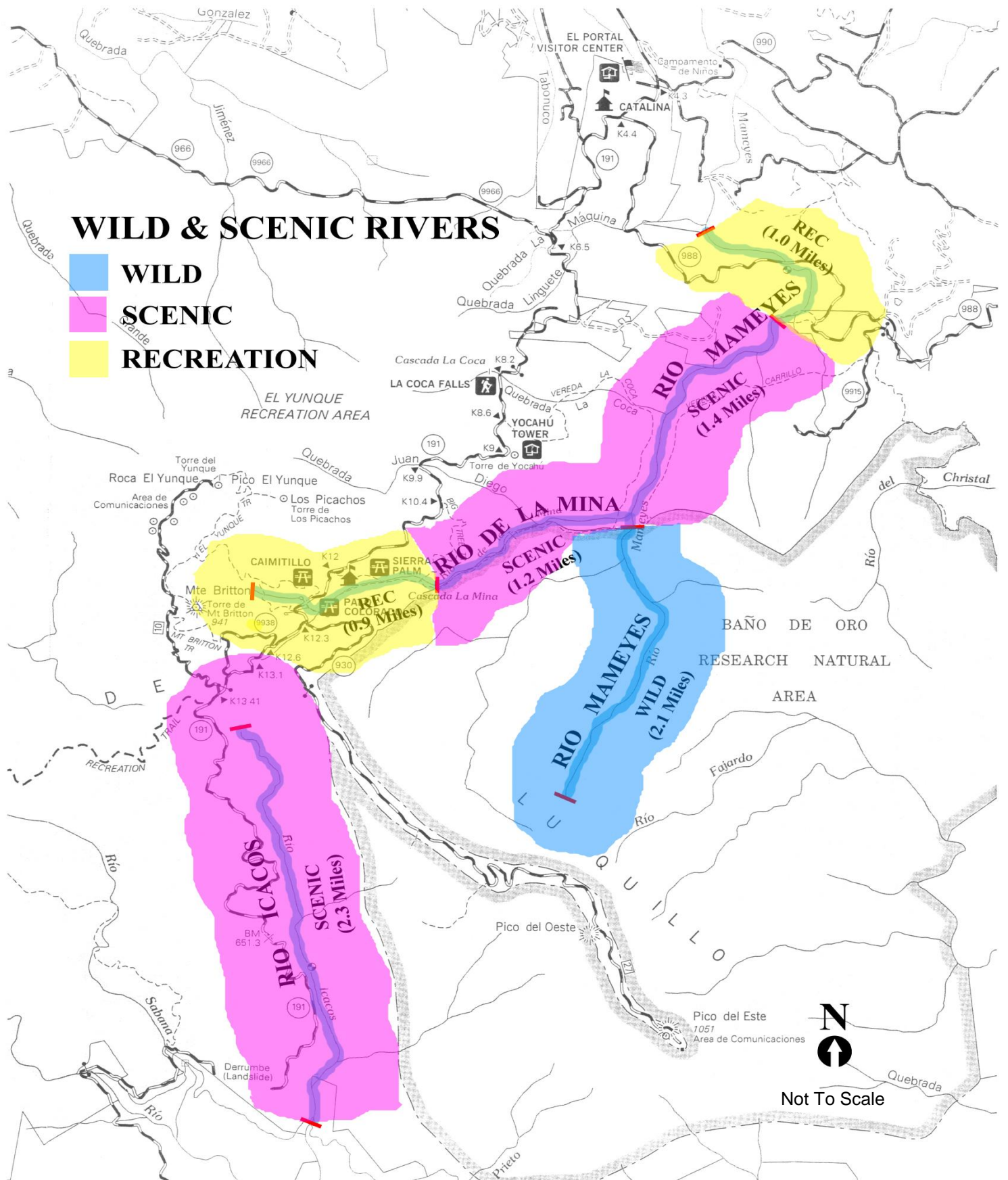
***Botanical:*** The tropical moist forests of Puerto Rico are characterized for their great diversity of plants, although somewhat less so than in continental tropical forest. More tree species occur on the CNF than in all the other 155 National Forest combined; and none of these species occur on any other National Forest. The Forest contains five ecological life zones: subtropical wet forest (Rio Mameyes), subtropical rain forest (Rio Mameyes, lower montane wet forest (Rio Icacos, Rio Mameyes and Rio de la Mina), lower montane rain forest (Rio Mameyes), and a small area of subtropical moist forest. Its vegetation includes four major forest types: Tabonuco, Palo Colorado, Sierra Palm and Cloud Forest. Monitoring of these zones is focused on invasive exotic species. Nearly one-third of the Forest's tree species are endemic to Puerto Rico and 10% are endemic to the Forest itself.

The core of the Forest remains in primary condition without significant human modification. This primary forest is the largest remnant of the original forest that covered virtually the entire island at the time of Columbus' arrival more than 500 years ago. The primary forest presents a unique window to the past, and a natural control against which past, and ongoing changes, in Puerto Rico's and other tropical forests, can be measured. It provides the only currently suitable habitat for many endemic plant species.

***Historic and Cultural:*** The Forest contains a variety of historical and cultural resources spanning pre-Columbian, Spanish colonial, and the early twentieth century. The three Wild and Scenic River corridors for the designated rivers – Rio Icacos, Rio de la Mina and Rio Mameyes - each contain unique heritage resources. The Rio Icacos corridor has Civilian Conservation Corps projects and sites dating from the 1930s, including trails, work camps, PR Hwy, 191 as well as an earlier hydroelectric dam and penstock beyond the south end of the corridor. The Icacos also has pre-Columbian petroglyphs located downstream from the corridor, and the potential for others within it. There is one rock shelter within the corridor, which Spanish Colonial ceramics in association with flaked stone tools. The Rio de la Mina probably derives its name from a mid-1800s Spanish Colonial period mining complex located within the Scenic section, or from a possibly earlier mining complex further upstream within the Recreation section.

### **Wild and Scenic River Classifications**

There are three classifications of rivers, or river segments, in the National Wild and Scenic Rivers System—wild, scenic, and recreational. Classification of segments on these three rivers is shown on the map (page 12). A detailed narrative of each river classification starts on page 13.



**1. Wild River.** The river should be free of impoundments. The shoreline should be essentially primitive with little or no evidence of human activity; however, the presence of a few inconspicuous structures is acceptable. There should be little or no evidence of past timber harvest and no ongoing timber harvest. The river area should be generally inaccessible except by trail. There should be no roads or other provision for vehicular travel; however, a few existing roads leading to the boundary of the river area are acceptable. Water quality meets or exceeds criteria of federally approved State standards for aesthetics, propagation of fish and wildlife normally adapted to the river, and primary contact recreation. (See page 14)

**Rio Mameyes Wild Classification** begins at its headwaters in the Baño de Oro Natural Area which is one of the most isolated areas in the Forest. The stream continues to the crossing point of Trails No. 24 and No.11 (Rio de la Mina and Bisley Trails) approximately 500 feet upstream from the confluence with the Rio de la Mina, a total of approximately 1.6 miles. This section of the river is in an isolated area and not easily accessible to the forest visitor because of its location within the Baño de Oro Natural Area. This area is not part of the recently designated El Toro Wilderness Area.

**2. Scenic River.** The river should be free of impoundments. The shoreline should be largely primitive and undeveloped with no substantial evidence of human activity; however, the presence of small communities, dispersed dwellings or farm structures is acceptable. Evidence of past or ongoing timber harvest is acceptable if the forest appears natural from the riverbank. The river area may be accessible in places by roads and roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads is acceptable. No criteria for water quality is prescribed in the Wild and Scenic Rivers Act. Poor water quality does not preclude classification provided a water quality improvement plan exists or is being developed.

**Rio Mameyes Scenic Classification** begins at the crossing of the Rio de la Mina Trail (Trail #24), Bisley Trail (Trail #11), and Carillo Trail (Trail #9) to the access point at Angelito Trail (Trail #7) , a total of approximately 1.4 miles. These are all primitive trails with no support facilities and no signage.

**Rio Icacos Scenic Classification** begins at its headwaters and flows south to the southern boundary of the CNF a total of approximately 2.3 miles.

**Rio de la Mina Scenic Classification** begins at La Mina Falls and flows downstream (north) to its confluence with the Rio Mameyes, a total of approximately 1.2 miles.

**3. Recreational River.** The river may have some development with substantial evidence of human activity. The presence of extensive residential developments and a few commercial structures is acceptable. Lands may have been developed for a full range of agricultural or forestry uses and may show evidence of past or ongoing timber harvest. The river area may be readily accessible by roads or railroads. The existence of parallel roads or railroads on one or both banks and bridge crossings is acceptable. No criteria for water quality are prescribed in the Act. Poor water quality does not preclude classification provided a water quality improvement plan exists or is being developed.

**Rio de la Mina Recreational Classification** begins at its headwater West of the Palo Colorado Recreation Area. It flows in a easterly direction crossing Baño de Oro Trail (Trail #25) and flowing on to Baño Grande Pool Area. The river crosses PR 191 at the Palo Colorado Picnic Area at Km.12.1. It flows through the picnic area and parallel to La Mina Trail (Trail #12) to La Mina Falls a total of approximately 0.9 miles. Palo Colorado and La Mina Falls are the most active recreation sites on the Forest. La Mina Falls is accessible by La Mina Trail (Trail #12) from the South and by Big Tree Trail (Trail #13) from the North. Along both trails there are shelters that can be found. The Falls are located where both trails meet precisely at La Mina Falls. These Falls are one of the main water attractions in the forest and a favorite destination for forest visitors to relax and enjoy the flora and fauna of this unique tropical setting. This area can become very congested with visitors during heavy use periods (weekends and holidays) throughout the year.

**Rio Mameyes Recreational Classification** begins at the crossing with Angelito Trail (Trail #17) and flows north to Puente Roto which is the crossing point with PR 988 and flows on to the northern boundary of the Forest which is a total of 1.0 mile. Puente Roto is a bridge crossing which has open areas adjacent to the road that are used as parking for bathers that enjoy cooling off in the different ponds that occur at this location. Puente Roto is mostly used by residents who live in the surrounding communities (Sabana, Mameyes, Mata de Platano and Buena Vista Carrion) to the Forest. This area can also become very congested with visitors during heavy use periods (weekends and holidays) throughout the year. There are no developed recreation facilities at this location making it necessary to monitor for trash accumulation along the road and the river banks.



## **II. Planning Context**

This section presents the existing Forest Plan that needs to be taken into consideration when developing CNF Comprehensive River Management Plan (CRMP).

### **Caribbean National Forest Plan**

The National Forest Management Act of 1976 required the preparation of Forest Plans to direct management of each National Forest. The management direction identified in this CRMP will be incorporated into the (1997) Caribbean National Forest Revised Land and Resource Management Plan (FRLRMP or Forest Plan) through a Plan Amendment. The Plan provides Forest-Wide Management directions and specific direction for the CNF Wild and Scenic River Corridors under Management Area 9.

### **Adequacy of Existing Regulations and Plans**

As the river-administering agency, the USDA Forest Service has the responsibility of ensuring that requirements of the Wild and Scenic Rivers Act are met within the river corridors. With the inclusion of this CRMP, the CNF will have sufficient mechanisms in place to protect water quality, free-flowing character, and to protect and enhance the Outstandingly Remarkable Values found within the segments of the river. The Forest will be the lead agency to monitor impacts of water resource projects in the corridor.

The plan amendment will include an update to the Forest Plan Management Area 9 map to include the Wild segment of the Rio Mameyes. Wildlife and Fisheries will also be added as an item in Standards and Guidelines.

### **How This Plan Will Be Implemented**

As technologies, information, and conditions change, the plan must be flexible enough to be effective. For that reason, the CRMP is a programmatic document that provides overall goals, objectives, standards, and monitoring guidance that ensure protection or enhancement of the Outstandingly Remarkable Values of the three river corridor's regardless of changing circumstances. The criteria for implementation priorities are described in Chapter IV. The list of implementation priorities is located in Appendix C and can be updated periodically as appropriate. Some of the implementation actions may require site-specific environmental analysis prior to an action.



### **III. River Plan's Management Direction**

Management Direction for the three rivers consists of the National Wild and Scenic Rivers Act, the designation legislation, the Caribbean National Forest Plan, the CNF Comprehensive River Management Plan (CRMP), and all other applicable federal laws, regulations, and plans. The Caribbean National Forest CRMP identifies the goals, objectives, and standards intended to guide the overall management of the CNF Wild and Scenic River Corridor. (See Appendix D, E and F for descriptions of the existing CNF Forest Plan direction for Wild and Scenic Rivers).

#### **River Plan Goals**

This plan establishes a more detailed set of goals, desired future condition, standard and guidelines for our rivers. These planning elements are included in the forest-wide direction for WSR and Management Area #9. The current LRMP direction will be amended. It will be named Forest Plan Amendment #3.

#### **All River Segments**

A variety of recreation opportunities will be available throughout the watersheds. These activities are dispersed in order to alleviate potential overcrowding or use conflicts. Access points such as trailheads and parking lots are strategically located in the corridor and watershed to aid in the dispersal of recreation use. Interpretation of the outstandingly remarkable values of the river's will be available in various forms to the public from low-key, off-site interpretive materials and technologies to interpretive signs at appropriate locations. Based on the topography, trail classification, the large boulders that are found along the river and its banks and the mostly isolated location of the rivers, No type of watercraft or inflatable water play items will be allowed on the rivers. For these same reasons horses, mountain bikes and ohv's are not allowed in all river segment.

#### **Wild Segment**

The Rio Mameyes is located in the *Baño de Oro Natural Area* which is a Research Natural Area. There are some research trails found in this natural area. Management of the wild segment will have limited access to persons doing research. All research must be properly permitted. The area will be



managed to retain its general undeveloped nature. Access is limited via Forest Service Road #27 (East Peak Road) which is outside of the river corridor. The limited access and activity in this area will basically allow nature to run its course without human intervention or interaction.

### Scenic Segment

Management of the scenic segment of the river corridor will be focused on maintaining and enhancing the near-natural environment. The riverbanks will be undeveloped and primitive, but may be accessible in places by trails. Recreation management will be designed to provide a natural-appearing setting. Research activity on or near these segments will be consistent free-flow and protecting river values for the visual impact they may cause. The Rio Icacos is more diverse than Rio de la Mina and Rio Mameyes because of its length and location. No developed facilities are found near these river corridors. The scenic segments are located in isolated areas and are not easily to get to. Their natural setting and isolation make them very attractive to those that are willing hike through challenging terrain.

### Recreational Segment

Management of the recreational segment of the river corridor will be focused on providing recreation in natural-appearing or culturally-influenced settings.

A capacity study should be conducted to establish maximum capacity during high use periods. Puente Roto and La Mina Falls are heavily visited during holidays and summer weekends.

Parking areas should be delineated at Puente Roto and Angelito trailhead to establish and manage capacity at these areas. The feasibility of adding other improvements at the Puente Roto recreation area will be studied. Improvements could include sanitary facilities, picnic grills, tables, and picnic shelters.

## **Forest Plan Amendment # 3 Forest Wide Direction**

### **Desired Future Condition**

River segments have been designated by Congress (CNF Wild and Scenic River Act, December 2002) as Wild, Scenic and Recreation rivers. These river segments will be managed to preserve their outstanding remarkable values and free-flowing conditions.

#### Wild Segment

The Rio Mameyes has the only Wild Segment and it originates in the *Baño de Oro Natural Area* which is a Research Natural Area. Management of the wild segment of the river corridor will be focused on protecting and preserving natural processes with minimal human influences and have limited access. Access to the area is limited to Forest Service Road #27 (East Peak Road) which is outside of the Rio Mameyes corridor and has controlled access.

#### Scenic Segment

Management of the scenic segment of the river corridor will be focused on maintaining and enhancing the near-natural environment. The riverbanks will be undeveloped and primitive, but may be accessible in places by trails. Recreation management will be designed to provide a natural-appearing setting with limited improvements. Research activity on or near

these segments will be monitored for the visual impact they may cause.

#### Recreational Segment

Management of the recreational segment of the river corridor will be focused on providing river-oriented recreation in natural-appearing or culturally-influenced settings. The river may be readily accessible by roads and trails. Recreational activity will be established to protect the resource and complement the setting. Certain recreation controls will be implemented related to activities and accommodations. Recreational improvements such as trailheads and river access points are available at La Mina Falls at the end of Big Tree Trail, LaMina Trail, and at Puente Roto on PR 988.

## **Goals**

### **All River Segments**

Manage to maintain the unique characteristics and scenic values of the river corridors.

Generally allow natural processes to determine the composition and distribution of plant species.

Control invasive plants and species.

Manage streams for Mountain Mullet, River Shrimp and Goby where conditions are favorable. Identify where population inventories indicate self sustaining populations.

### **Scenic River Segments**

Emphasize river oriented recreation opportunities favoring hiking, viewing wildlife and nature observation.

Manage use to provide a level of contact among visitors and impacts to the Outstanding Remarkable Values's that is consistent with the river classification. Implement the Limits of Acceptable Change (LAC) concept to monitor levels of use within the river corridor.

### **Recreation River Segments**

Control and eradicate invasive fauna.

Emphasize river oriented recreation opportunities favoring hiking, viewing wildlife and nature observation.

Manage use to provide a level of contact among visitors and impacts to the Outstanding Remarkable Values's that is consistent with the river classification. Implement the Limits of Acceptable Change (LAC) concept to monitor levels of use within the river corridor.

Improve parking layout and access to river at Puente Roto

Improve public awareness and understanding of the Outstanding Remarkable Values of the three WSR's and the National Wild and Scenic River System.

Provide access for use and enjoyment of the rivers consistent with the river

classification at Big Tree Trail, Angelito Trail, La Mina Trail and La Coca Trail.

Address capacity issues at La Mina Falls and Puente Roto

<b>Table 4-3. Wild, Scenic and Recreation Rivers (Designated Dec. 2002)</b>		
<b>River</b>	<b>Classifications</b>	<b>Length Miles</b>
Río Mameyes	Wild	1.6 miles*
	Scenic	1.4 miles
	Recreation	1.0 miles
Río de la Mina	Scenic	1.2 miles
	Recreation	0.9 miles
Río Icacos	Scenic	2.3 miles

\*Corrected length.

## **Standards and Guidelines**

- S 1. Develop management plans with specific management requirements for designated rivers after designation. Pattern specific directions after the generic management direction in Chapter 8.2 of the Land and Resource Management Planning Handbook (FSH 1902.12). Pending designation and the subsequent development of a river management plan(s), the following management direction will be implemented to ensure protection of the qualities that make the rivers eligible.

### **Wild Rivers**

#### ***Timber***

- S 1. Cutting of trees is not permitted except when needed in association with a primitive recreation experience (such as clearing for trails and protection of users) or to protect the environment (such as control of fire).

#### ***Water Supply***

- S 2. All water supply dams and diversions are prohibited.

#### ***Hydroelectric Power***

- S 3. No development of hydroelectric power facilities is permitted.

#### ***Flood and Erosion Control***

- S 4. No flood control dams, levees, or erosion control work is allowed.

#### ***Road Construction***

- S 5. No roads or other provisions for overland motorized travel are permitted within 1/4 mile of the riverbank.

#### ***Recreation Development***

- S 6. Major public-use areas, such as large picnic areas, interpretive centers, or administrative headquarters are located outside the Wild Rivers area. Recreation developments are limited to trails and unobtrusive bridges

and signs, and improvements necessary for resource protection.

- Structures**
- S 7. A few existing structures could be allowed assuming such structures are not incompatible with the essentially primitive and natural values of the river and its corridor. New structures are not allowed except in rare instances to achieve management objectives (e.g. structures and activities associated with fisheries enhancement programs could be allowed).
- 

**Visual Resource**

- G 1. Follow the Scenery Management System (SMS) guidance when implementing the Forest Plan.

**Vegetation Management**

- G 2. Use native plant species where possible when restoring impacted sites.
- G 3. Allow woody debris to accumulate along river and shorelines to maintain natural character of river.

**Wildlife and Fish Resource**

- G 4. Manage habitat of Mountain Mullet streams as a first priority.
- G 5. Trap and remove feral cats, dogs and mongoose.

**Geology**

- S 8. No hunting or fishing is allowed.

**Cultural Resources**

- S 9. No mining activity to occur. Rock extraction is prohibited.
- S10. Manage historic sites consistent with forest-wide standards. Stabilize and protect existing sites.

**Water Supply**

- S 11. No development of hydroelectric power facilities is permitted.

**Scenic Rivers**

**Timber**

- S 1. Timber demonstration is located at least 1/4 mile away from

rivers suitable for Scenic River designation. Vegetation treatments for wildlife habitat improvement is allowed provided that such practices are carried on in such a way that there is not substantial adverse effect on the river and its immediate environment. The river should be maintained in its near natural environment.

- |                                   |      |   |
|-----------------------------------|------|---|
| <b>Water Supply</b>               | S 2. | All water supply dams and major diversions, that would have a direct and adverse effect on the values for which the river area is included in the National System, are prohibited. Modest diversions are allowed only if there would be no direct and adverse effect on river values. |
| <b>Hydroelectric Power</b>        | S 3. | No development of hydroelectric power facilities is allowed.  |
| <b>Flood and Erosion Control</b>  | S 4. | Flood control dams and levees are prohibited. Erosion control treatments can be implemented if they do not detract from river values.   |
| <b>Road Construction</b>          | S 5. | Roads should generally not be visible from the rivers suitable for Scenic River designation. No new road construction is permitted within 1/4 miles of such rivers.   |
| <b>Recreation Development</b>     | S 6. | Larger scale public use facilities, such as large picnic areas, public information centers, and administrative headquarters are well screened from rivers suitable for Scenic River designation. Modest and unobtrusive recreation facilities are permitted.                          |
| <b>Structures</b>                 | S 7. | New structures that would have a direct and adverse effect on river values are not allowed.   |
| <b>Visual Resource</b>            | G 1. | Follow the Scenery Management System (SMS) guidance when implementing the Forest Plan.  |
| <b>Vegetation Management</b>      | G 2. | Use native plant species where possible when restoring impacted sites.  |
|                                   | G 3. | Allow woody debris to accumulate along river and shorelines so as to maintain natural character of river.   |
| <b>Wildlife and Fish Resource</b> | G 4. | Manage habitat of Mountain Mullet streams a first priority.   |
|                                   | S 8. | Trap and remove feral cats, dogs and mongoose.  |

	S 9.	No hunting or fishing is allowed.
<b>Cultural Resources</b>	G5.	Manage historic sites consistent with forest-wide standards. Stabilize and protect existing sites
<b>Special Uses</b>	S10.	Limit land-based permits to groups of no more than 15 (including guides).
	S11.	Allow access to La Mina site and Rio de la Mina Trail only to guided tours by Special Use Permit.
<b>Geology</b>	S12.	No mining activity to occur. Rock extraction is prohibited.
<b>Dispersed Recreation</b>	G 5.	Implement “Pack-it-in and Pack-it-out” and “Leave No Trace” concepts.
	S 13.	Allow primitive camping at designated areas by permit only. No camping within 100 feet of rivers. Evidence of use to be noticeable but not dominant. No fires or fire rings allowed. Use only commercial cooking apparatus
	S 14.	Only hikers permitted on trails. No horses, bikes or OHV’s are permitted on trails.
	S 15.	Tubes and rafts are not permitted in rivers.
<b>Water Supply</b>	S 16.	No development of hydroelectric power facilities is permitted.

## Recreation Rivers

<b>Timber</b>	S 1.	Timber demonstration is located at least <sup>1</sup> / <sub>4</sub> mile from rivers suitable for Recreation River Designation. Vegetation treatments for wildlife habitat improvement are allowed provided that such practices are carried on in such a way that there is not substantial adverse effect on the river and its immediate environment. Woody debris is allowed to remain along the river bed and its banks.
<b>Water Supply</b>	S 2.	Low dams, diversion works, rip rap, and other minor structures are allowed provided the waterway remains generally natural in appearance.
<b>Hydroelectric Power</b>	S 3.	No development of hydroelectric power facilities is allowed.
<b>Flood and Erosion Control</b>	S 4.	Flood control dams and levees are prohibited. Erosion control treatments can be implemented if they do not detract from river values.
<b>Road Construction</b>	S 5.	Paralleling roads could occur on one side of the river. There can be several bridges crossings and numerous river access points. New road construction is limited to access and parking for developed recreation sites.
<b>Recreation</b>	S 6.	Picnic areas and trails constructed may be in close

<b>Development</b>	proximity to the river.
<b>Structures</b>	S 7. New structures are allowed for recreation use.
<b>Special Uses</b>	S 9. Limit land-based permits to groups of no more than 15 persons (including guides). S10. Allow access to La Mina site and Rio de la Mina Trail only to guided tours by Special Use Permit.
<b>Geology</b>	S11. No mining activity to occur. Rock extraction is prohibited.
<b>Dispersed and Developed Recreation</b>	S12. Allow primitive camping at designated areas by permit only. No camping within 100feet of rivers. Evidence of use to be noticeable but not dominant. No fires or fire rings allowed. Use only commercial cooking apparatus G 7. Minimize trash impacts at La Coca and Juan Diego sites. G 8. Implement "Pack-it-in and Pack-it-out" and "Leave No Trace" concept. S13. Only hikers permitted on trails. No horses, bikes or OHV's are permitted on trails. S14. Tube and rafts are not permitted in rivers. S15. Conduct site condition inventory to determine use patterns, site conditions and their specific limits to be monitored. Rehabilitate degraded sites and if necessary, relocate or restrict use at those sites. S16. Prohibit BBQ grills within full bank stage at all river segments. S17. Prohibit glass containers within full bank stage at all river segments. G 9. New development, bridge replacements, and landslides reconstruction will be designed to minimize disturbance of riparian areas.
<b>Interpretation</b>	G10. Focus wildlife interpretation on highly visible species.
<b>Soil and Water</b>	G11. Complete a water quality monitoring Plan. G12. Monitor water quality above and below recreation segments. G13. Stabilize dispersed recreation sites that have exposed and/or highly compact erodible mineral soil.
<b>Geology</b>	S10. No mining activity to occur. Rock extraction is prohibited.
<b>Trail Management</b>	G14. Manage trails for hiking use only compatible with the LRMP and the Outstanding Remarkable Values of the corridors.

## **Modified Management Area 9 – Wild, Scenic and Recreation River Corridors**

### **Desired Future Condition**

This management area was established to provide increased protection for river segments designated Wild, Scenic or Recreation Rivers for the Rio Mameyes, Rio de la Mina and Rio Icacos.

These river and their corridors will continue to exhibit the outstanding remarkable characteristics that made them Wild, Scenic and Recreation Rivers.

### **Goals – All Rivers**

All rivers remain free of impoundments within the existing forest boundary.

Periodically monitor all rivers to confirm their Outstandingly Remarkable Values are being maintained.

Provide opportunities for treatment vs. control research to the extent such use does not detract from Wild, Scenic or Recreation River qualities. Recognize that the Icacos River corridor includes forest and soil types not available for experimental use elsewhere on the Forest.

### **Goals -**

#### **Río Icacos**

Access the river through natural openings found along PR 191 South.

Improve water quality by reducing sedimentation from landslides and PR 191

Maintain ditches and culverts on the section of PR 191 closed to public traffic so as to reduce the concentration of water flow onto slopes prone to landslides.

Stabilize areas of exposed soil caused by landslides.

#### **Río Mameyes**

Improve recreation opportunities and water quality by providing facilities at Puente Roto.

Continue to provide garbage collection and periodic clean-up along



**Río de la Mina**

the river bank at Puente Roto.

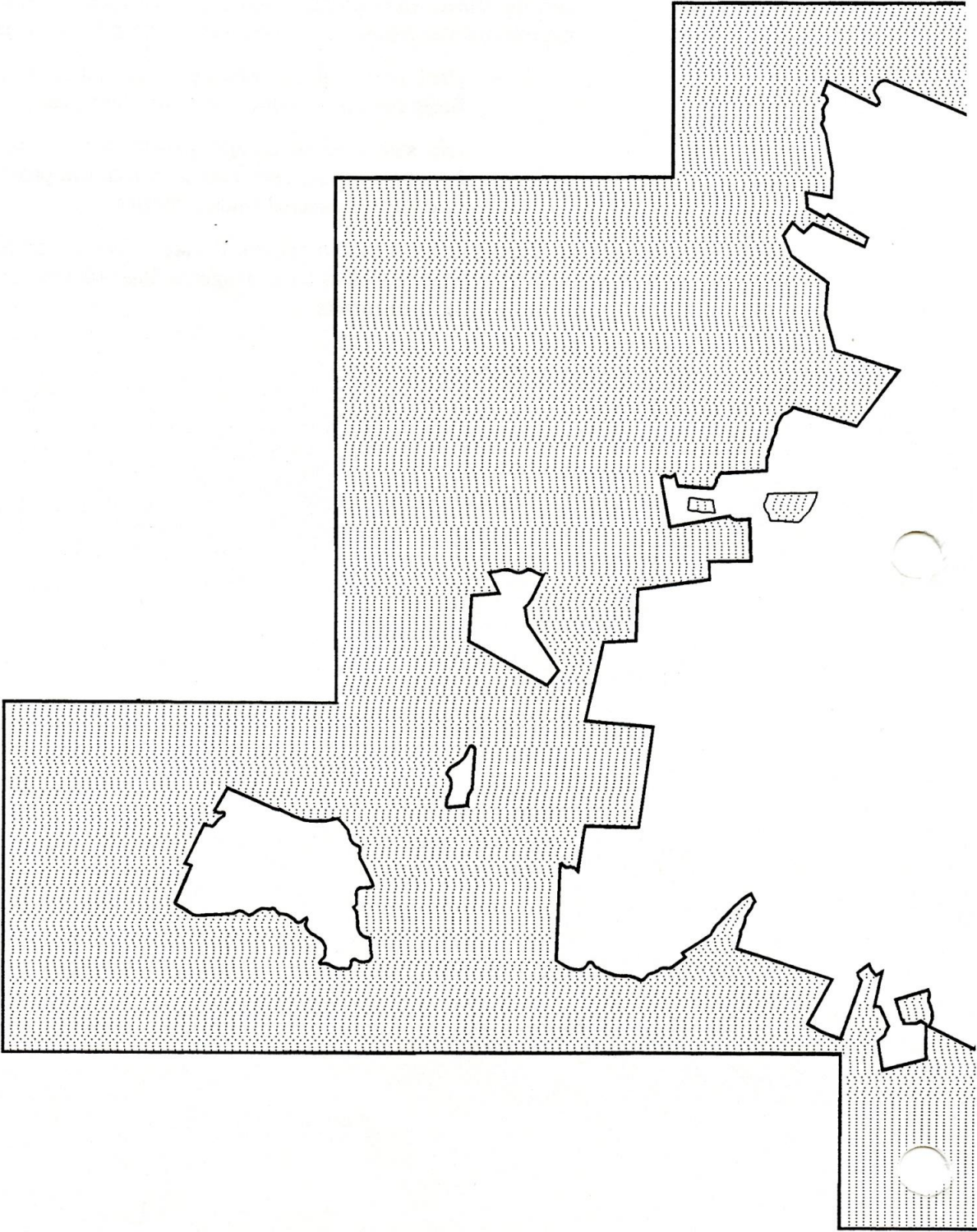
Conduct a capacity study for Puente Roto

Improve the parking layout at Puente Roto.

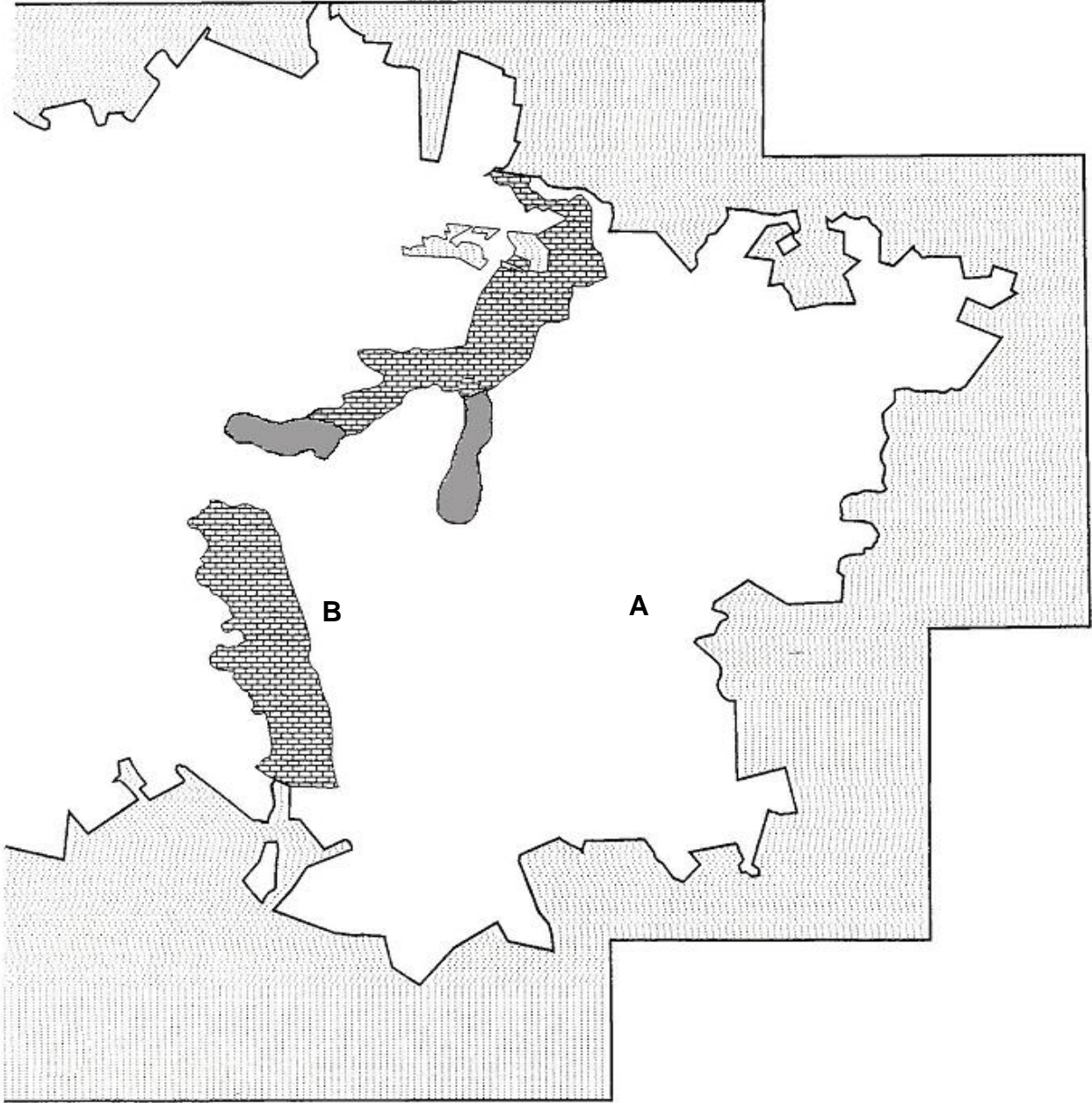
Continue to provide garbage collection and periodic clean-up along the river banks.

Conduct a capacity study for the La Mina Falls area

**FIGURE 4-10. MANAGEMENT AREA 9 - WILD/SCENIC/RECREATION RIVER CORRIDORS (Revised)**  
**GRAFICA 4-10. ZONA DE MANEJO 9 - CORREDORES DE RÍOS SILVESTRES/PANORÁMICOS/RECREACIONALES**



**Revised Management Area 9** (includes the Wild river segment of Rio Mameyes (A) and extend Recreation segment of Rio de la Mina (B))



**WSR Corridor Boundaries**

The CNF National Wild and Scenic River Corridor Boundary consists of the lands within approximately ¼ mile on either side of the banks of the Rio Mameyes, Rio de la Mina and Rio Icacos. It contains an average of less than 320 acres per mile. There is no fully surveyed boundary.

The US Forest Service has responsibility for administering the WSR Corridors under the Wild and Scenic Rivers Act to ensure protection of water quality, free-flowing character, and protection and enhancement of the outstandingly remarkable values.



#### **IV. Criteria for Implementation Priorities**

This section contains the criteria to guide subsequent site-specific agency decisions and a description of the types of probable management actions, including the objectives/intent of an action that may occur within the WSR corridors.

Because the amounts and types of funds are not always predictable and it is necessary to adjust priorities from year to year, it is not possible to set rigorous priorities for expenditures over the long term.

Criteria have been established to help determine prioritization and allocation of funding and staff time. Priority of actions will be addressed in the following order:

1. Monitor water quality along the three rivers to include Quebradas Juan Diego and La Coca
2. Program doing a LAC study for recreation segments of the rivers
3. Improvements or actions within the corridor that meet the direction of the CRMP
4. Improvements or actions within the Watershed that enhance the corridor and meet the direction of the CRMP

Priority actions are listed in Appendix C. The list can be updated as needed without amending the Comprehensive River Management Plan or the Caribbean Forest Plan.



## V. Monitoring

This section has three purposes: to determine the extent to which the plan is being implemented (See Appendix F); to help the US Forest Service understand how management of the river corridors is affecting free –flowing condition, water quality and outstandingly remarkable values; and to help identify conditions needing corrective actions to protect and enhance river values. Monitoring will be defined on two scales -- long-term trends and effectiveness of specific activities.

For each river item to be monitored, one or more indicators are selected that will allow managers to keep attuned to changes in the ecosystem or social setting. For each indicator, a measured technique is set. This is the value that determines the amount of change that is either desired or that will be accepted before river management objectives are no longer being met. In this manner, indicators and thresholds provide managers with information to determine if the resource values and opportunities they are managing are actually being provided. The standards serve as triggers that cause predetermined management actions to be implemented when the limit is being reached.

For each monitoring item and standard, a “Threshold of Acceptable Change” column lists the likely action that would be triggered if a particular threshold is reached. Monitoring methods provide an example of how the indicator might be measured, but these sample methods can and should be changed as better means become available. Additional monitoring is identified in this section that provides resource inventories or baseline data that is necessary to establish thresholds. The CRMP implementation will include the final development of these thresholds where none yet exist.

## Modified Forest Plan Monitoring

<b>Table 5-1. Monitoring the Desired Future of the Forest</b>				
<b>Monitoring Item and Desired Future</b>	<b>Indicators of Desired Future</b>	<b>Item Measured Measurement Technique</b>	<b>Threshold of Acceptable Change</b>	<b>Monitoring/ Reporting Period</b>
<b>Wild, Scenic and Recreation Rivers</b>				
Scenic	Projects, activities, modifications do not alter landforms, vegetation, water or site character within the river corridor.	Meet establish VQO as stated in the Forest Plan. Should implement the SMS when amending the Forest Plan.	Proposed actions meet established VQO's.	Monitor continuously; report annually
Recreation	Quality and Quantity of experience	<p>ROS setting parameters for minimization of user conflicts and crowding.</p> <p>Indirect actions such as education, information, and signing efforts.</p> <p>Direct actions such as enforcement, use restrictions and capacity limits.</p>	<p>ROS and SMS parameters are met.</p> <p>Site degradation and vandalism is minimal.</p>	<p>Periodic user satisfaction sampling at least every 5 years.</p> <p>Conduct site condition surveys to establish trends of impact and effectiveness of rehabilitation.</p>
Fish and Wildlife	<p>Water Quality.</p> <p>Fisheries Resource Condition</p>	<p>Meet EPA and State standards required to support beneficial uses.</p> <p>Meet LRMP direction for maintenance of viable populations of</p>	<p>Meet EPA and State standards required to support beneficial uses are met.</p> <p>Habitat of native species including but not limited to the Goby and River</p>	<p>Water quality baseline monitoring to include macro-invertebrates, water temperature, dissolved oxygen, pH, total dissolved solids and fecal coliform.</p> <p>Long term fish population monitoring and River Shrimp population monitoring.</p>

		management indicator species, and other state, federal and local regulations pertaining to the viability of aquatic species.	Shrimp is maintained	
Historic and Cultural	Cultural Site Integrity	Compliance with Sections 106 and 110 of the National Historic Preservation Act for all land disturbing activities and use.	All historic structures and resource sites to remain in a safe and stable condition.	Annual Monitoring
Botanical	Integrity of Plant Communities	Maintain native populations and plant community diversity.	Prevent unacceptable levels of disturbance along WSR's.  Restore habitats, plant population and communities.	Inventory, map, and monitor plant communities within the WSR's watershed on an annual basis.
<p>Abbreviations:  I = Implementation monitoring  E = Effectiveness monitoring  V = Validation monitoring</p>				



## **Appendix A: Detailed Resource Descriptions of the River Corridors**

### **Physiography**

The corridors lie within two physiographic watersheds. The streams begin at the upper elevations of the Forest at over 2,000 feet. The Rio Mameyes and Rio de la Mina flow to the north and the Rio Icacos flow to the south. The Rio Mameyes has a steep drop of 1730 feet to 230 feet elevation at the Forest northern boundary. The Rio Icacos has a gentler drop of 682 feet to 450 elevation elevation at the Forest southern boundary.

The three rivers are bounded by steep, rugged slopes throughout their lengths, except for a segment of the Rio Icacos which are relatively flat with a moderate slope and sandy base. The flood plains are narrow at the rivers headwaters. From there they become wider and gentler down stream. The floodplain becomes very wide and gentle once the streams leave the Forest boundary.

### **Geology And Minerals**

The Caribbean Islands were formed over 200 million years ago from submarine volcanic eruptions whose magma solidified to produce the dense igneous rock that was subsequently folded and faulted by the resulting compressional forces. These rocks formed the cores of what are now the Greater Antilles islands. In what became the island of Puerto Rico this core formed the Cordillera Central (central mountain corridor), and, at the island's northeast corner the Luquillo Mountains, where the Caribbean National Forest is located. These mountains have sharp jagged peaks and steep angled slopes with deeply notched valleys created by stream erosion.

Drainage off the slopes is almost entirely to the north or south. The composition of the bedrock is primarily volcanic with some intrusive igneous rock. The soil of the area is primarily composed of inceptisols. These young soils are susceptible to excessive erosion rates due to the rugged mountain relief. Landslides and earth slips are frequent, limiting soil horizons to terrace along rivers. Fertility of the soils is transitory, produced by forest leaf fall, with the rainfall continually



leaching out the mineral content. There are no reserved or outstanding mineral rights on NFS lands. These conditions are common among the three rivers.

### **Soils**

The Forest soils are made of quaternary unconsolidated alluvial deposits (sands, gravels, silts and clays) occurring along major water courses. Most nutrients necessary for plant growth are in the top 4 inches of the Forest's soils, as is typical of tropical rain forest. Most Forest soils are comprised of high percentages of clay (45-80%). Sandy textured soils are associated with the area of quartz diorite parent rock on the Forest's south side where the Rio Icacos is located. Intense rains and steep slopes make the Forest's soils highly erodible when vegetative cover is removed. The sandy diorite-derived soils lack cohesion, so they are particularly susceptible to erosion.

Montane wetlands occur on slopes where soils are shallow and poorly drained. Evapotranspiration is low, and water does not drain rapidly. As a result, soils above 2,000 feet (600 meters) elevation are generally saturated with water, even on exposed slopes. The extreme wetness of the soils gives rise to bog conditions, including growth of sphagnum moss, superficial plant roots and accumulation of incompletely decomposed organic matter. The Picacho-Utuado complex, 5 to 35 % slopes, is on hills and footslopes in mountain river valleys. This complex is characterized by dissected low hills and drainageways between steep side slopes and the adjacent alluvial lands. This unit receives water from the adjacent upper areas and from frequent rainfall.

<b>Icacos River</b>	<b>Mapping Unit</b>	<b>Description</b>
Scenic	Icacos Loam	Floodplain soils at middle elevations.
Scenic	Picacho-Utado Complex, 35 to 80% slopes	Mountain side soils at middle and upper elevations.
Scenic	Picacho-Utuado Complex, 5 to 30% slopes	Hills and foot slopes soils located in river valleys at middle and high elevations.
Scenic	Picacho-Ciales Complex, 5 to 35% slopes	Ridge top soils at middle elevations.
Scenic	Yunque cobbly clay, 40 to 80% slopes, extremely stony	Mountain canyons and side slopes soils.
Scenic	Zarzal very cobbly clay, 40 to 80% slopes	Mountain side slope soils lower elevations.

<b>La Mina River</b>	<b>Mapping Unit</b>	<b>Description</b>
Scenic	Picacho-Ciales Complex, 5 to 35% slopes	Ridge top soils at middle elevations.
Scenic	Yunque-Los Guineos-Moteado Complex, 5 to 30% slopes	Summit, ridgetops, and mountain side slopes at upper and middle elevations.
Scenic, Recreation	Yunque-Moteado Complex, 20 to 65% slopes	Mountain side slopes soils at middle and upper elevations.
Scenic	Guayabota-Yunque Complex, 30 to 60% slopes	Mountain side slopes soils at middle elevations.
Recreation	Palm-Yunque complex, 35 to 85% slopes, extremely stony	Mountain side slopes soils at upper elevations.
Recreation	Guayabota-Yunque complex, 30 to 60% slopes	Mountain side slopes soils at middle elevations.

<b>Mameyes River</b>	<b>Mapping Unit</b>	<b>Description</b>
Scenic	Zarzal – Cristal Complex, 20 to 60% slopes	Mountain side soils dominant at lower elevations.
Scenic, Recreation	Cristal-Zarzal Complex, 5 to 40% slopes	Mountain side soils dominant at lower elevations.
Scenic, Recreation	Zarzal very cobbly clay, 40 to 80% slopes	Mountain side soils dominant at lower elevations.

## **Stream Flow and Water Quality**

Water flowing from the Forest is abundant and of high quality, and provides many benefits. The Forest furnishes water for municipal and domestic uses, electrical power generation, and recreation. Water provides fish and wildlife habitat, and supports a lush tropical forest. The WSR segments of the three rivers are free-flowing with no artificial dams, channel diversions or other flow regulating structures. Because the entire watersheds are free flowing, stream-flow can fluctuate significantly with seasonal rainfall. Heavy rains occur throughout the year, but on average May is the wettest month and March the driest. Higher elevations, where the headwaters of the three WSR are located, have about 250 rainy days annually.

<b>River</b>	<b>Average Stream Flows (cubic feet/second)</b>	<b>Resource Maintenance Flow Claimed (cubic feet/second)</b>	<b>Annual Quantity Claimed (acre feet)</b>	<b>Water Use during 1976</b>	<b>Year Water Use Began</b>
Rio Icacos	61.8	8.6	9200	Maintenance of Ecosystems	1903
Rio Icacos	61.8	14.0	10,100	Research	1939
Rio Mameyes and La Mina	82.0	14.0	18,000	Recreation	1903-1962
Rio Mameyes and La Mina	82.0	28.3	21,000	Research	1949
Rio Mameyes and La Mina	82.0	35.0	25,500	Research	1939-1962

The Forest's streams are considered high quality waters that constitute an exceptional resource (EQB, 1990). Generally, the water meets or exceeds local water quality standards. Fecal coliform limits are being exceeded at Puente Roto (Rio Mameyes recreation segment) a heavily used undeveloped water play sites on PR 988.

Field data collection was conducted to establish a water quality baseline on Puente Roto. The baseline parameters can be used to monitor water quality during and after construction of any improvements at the site which may include picnic shelters, bathrooms, and parking. The PR Department of Natural Resources is aware of the river designation. Their Rangers assist in providing support when water quality and water fauna is affected. Because the rivers are in Forest lands there is limited interest in developing partnerships with stakeholders outside the forest boundary. There is an interest to make the lower portion of the Rio Mameyes a WSR and is being pursued by camping association.

<b>Water Quality Data at Puente Roto Crossing. (Rio Mameyes Recreation Segment)</b>	
Quality Indicator	Baseline Data
Solids and other matter	Free of deleterious matter
Color	Free
Odor	Free
Turbidity	Clear
Temperature	25.47, No thermal discharge
Oil and Grease	No thermal discharge
PH	8.69, alkalinity
Dissolved oxygen	7.58
Conductivity	113.10
Salinity	0.03
stage	1.80
Carbon Dioxide	4 ppm
Chlorides	44 ppm
Nitrate	Less than 0.2 ppm
Phosphate	Less than 0.2 ppm
Silica	20 ppm
Sulfide	Less than 0.2 ppm

The Forest roads are characterized by a high landslide frequency. Landslides and water play recreation are the main contributors of sediment to the Forest's streams. The FS has been working in the stabilization of exposed areas caused by landslides. No restoration work is done on interior slides (slides located more than 100 feet away from roads or trails). Landslides are sources of non-point pollution (Section 319 of the Clean Water Act). Landslide restoration in certain cases requires use of mechanized equipment and special techniques. This work

is necessary to reduce erosion and subsequently contamination of these waters. Any project work in river bed or bank must also be consistent with Section 7(a).

Other non-point source pollutants are the bridges, trails and debris which have an effect on the water quality, recreation, wildlife and water consumption. Periods of high forest visitation could increase the variety and amount of pollutants such as oil, grease and chemicals caused by the automobiles (EPA, 2000). In terms of the water play, the FS goal is to improve recreation opportunities by working on the identification of the most visited areas. Rio de la Mina has two developed recreation areas that are in the scenic segment of Rio de la Mina. These are the Sierra Palm and Palo Colorado Recreation Area. This river also has two trails that come to a high visitation water play area called La Mina Falls; these trails are Big Tree and La Mina Trail. Also, Quebrada Juan Diego, tributary of Rio de la Mina, is a high visited area for nature viewing and water play. These three areas should be monitored because of its high recreational use. Changes should be monitored over time to help set levels of protection in water quality standards. Monitoring will also identify problem areas that are emerging or that need additional regulatory and non-regulatory actions to support water quality management decisions such as non-point source management. Presently only sampling from one site but with plans to expand to La Coca and Juan Diego.

Residential and commercial developments affect the water quality and quantity as point-source pollutants outside the Forest which are beyond the Rio Mameyes Recreation boundary. There are frequent sewer drains into the lower portion of the Rio Mameyes. This condition affects water chemistry off-forest. The condition can have a negative impact on aquatic species migration in designated segments of Rio Mameyes.

Another point of pollution are the ranches, farms and golf courses which contribute fertilizer and other waste to the lower portions of the Rio Mameyes which is well beyond the recreation segment of the rivers. Runoff from this ranch could contribute with unacceptable levels of bacteria, hormones, animal wastes, pesticides, herbicides, and fertilizers, as well as large amounts of sediment due to the proximity of the river. It must be remembered that rivers contain living creatures and plants, many of them microscopic but very important members of the foodweb, can be killed by pesticides and herbicides. When part of the foodweb is eradicated by these chemicals, the animals that depend on them starve or fail to reproduce. Fertilizers cause their own problems: they enrich rivers, causing the growth of algae, removing oxygen from the water and blocking light. This situation requires attention in terms of the whole watershed health in terms of protecting the different ecosystems.

## **Fish And Wildlife**

The fauna of the Caribbean National Forest (CNF) is one of most distinguishable communities in the National Forest System. Species from this National Forest exhibit traits unique only to tropical ecosystems. Both aquatic and terrestrial

animal species on the Forest have many distinct characteristics that have evolved through interactions that promote specialization. Tropical rain forests have the greatest diversity of species of all communities (*Campbell, 1993*). The range of species includes over 127 terrestrial vertebrates and 17 freshwater species.

One of the most important ecological terms created to describe the environmental elements of a community is biodiversity. Biodiversity has been defined as “the variety of life in an area, including the variety of genes, species, plant and animal communities, ecosystems, and the interactions of these elements (*USDA Forest Service (b), 1997*). The CNF boast a spectacular degree of biodiversity in comparison to other National Forests. The Forest boasts a spectacular degree of biodiversity in comparison to other National Forests.

Complex ecological processes that enable multiple species to exist are supported by healthy terrestrial ecosystems and waterways. Within this network of species and biotic interactions some species are grouped together into meaningful management categories developed by land management agencies. Certain species that are in danger of extinction are categorized according to the severity of their status. Those classes are proposed, endangered, threatened and sensitive collectively known as “PETS”. In the National Environmental Policy Act (NEPA) process all four mentioned categories are address in a Biological Evaluation (BE). In this project area, which is the 3 river corridors, .four endangered fauna species were addressed to ensure no adverse affects are committed to them or a significant part of their habitat. The PR Parrot was not among the four. The parrot habitat is not located within the forests WSR corridors. Requests for official determinations were sent by the U.S. Fish and Wildlife Service (USFWS). Refer to the BE for the proposed plan for management of the wild and scenic rivers of the CNF.

### **Threatened and Endangered Species**

PETS (proposed, endangered, threatened and sensitive species) are managed cooperatively with the Puerto Rico Department of the Environment and Natural Resources, the U.S Forest Service and the U.S. Department of Interior Fish and Wildlife Service. There are 51 known PETS species within the Forest. The following is a description of the PETS and their habitats in the three rivers:

#### **Rio Mameyes and Rio de la Mina**

The Rio Mameyes provides important habitat for the Puerto Rican Parrot and Puerto Rican Boa, both endangered species. The endangered Broad-winged and Sharp-shinned Hawks, are known to occasionally use the area. No species of sensitive Coqui are known to occur, but the numerous waterfalls associated

with this system could potentially support population of the web-footed Coqui. Suitable habitat also exists for the sensitive Red Fruit Bat.

### **Rio Icacos**

The Rio Icacos valley is not currently occupied by the Puerto Rican Parrot, but was historically an important use area, and is designated as “essential habitat” for the species’ recovery. The Rio Icacos is known to be inhabited by the Puerto Rican Boa. The Rio Icacos valley is occasionally visited by the endangered Broad-Winged Hawk, and possibly by the endangered Sharp-shinned Hawk. The sensitive Burrow Coqui is known to occur in the upper headwater areas. Suitable habitats exist for the sensitive Mottled and Web-footed Coquis and for the sensitive Red Fruit Bat.

Although there are no aquatic PETS species designated on the Forest, the topography associated with the Rio Icacos valley makes it a unique aquatic ecosystem. Whereas most Forest streams over steepen in their upper reach, the upper Rio Icacos is a sinuous, low-gradient, slow moving stream characterized by fine substrates. It is one of only two such streams on the Forest.

The Forest Plan establishes 12 animal Management Indicator Species (MIS) for the Forest: In the “Species Location” Table below there is a list of these species with general locations where each species may be found.

<b>Common Name</b>	<b>Scientific Name</b>	<b>Forest Range</b>
Puerto Rican Parrot	<i>Amazona vittata</i>	Forest interior
Sharp-shinned Hawk	<i>Accipiter striatus venator</i>	Forest-wide
Broad-winged Hawk	<i>Buteo platypterus brunnescens</i>	Forest-wide
Elfin Woods Warbler	<i>Dendroica angelae</i>	Cloud Forest region
Black-throated Blue Warbler	<i>Dendroica caerulescens</i>	Forest-wide
Tree-hole coqui	<i>Eleutherodactylus hedricki</i>	Mid-elevation sites
Warty Coqui	<i>Eleutherodactylus locustus</i>	Low to Mid-elevation sites
Burrow Coqui	<i>Eleutherodactylus unicolor</i>	Mid to high elevation sites
Yellow-bearded Anole	<i>Anolis gundlachi</i>	Forest wide
Goby	<i>Sicydium plumieri</i>	All Forest rivers
Mountain Mullet	<i>Agonostomus monticola</i>	Two major Forest rivers
River Shrimp	<i>Macrobrachium carcinus</i>	All Forest rivers

The majority of these MIS can be found in the forest WSR corridors with the exception of the PR Parrot and the Sharp shinned Hawk.

### **Vegetation**

The tropical moist forests of Puerto Rico are characterized by their great diversity of plants, although somewhat less so than in continental tropical forest. More tree species occur on the CNF than in all the other 155 National Forest combined; and none of these species occur on any other National Forest.

The Forest contains 5 ecological life zones: subtropical wet forest, subtropical rain forest, lower montane wet forest, lower montane rain forest, and a small area of subtropical moist forest. Its vegetation includes four major forest types: Tabonuco, Palo Colorado, Sierra Palm and Cloud Forest. Nearly one-third of the Forest's tree species are endemic to Puerto Rico and 10% are endemic to the Forest itself.

### **Rio Mameyes**



Due to steep slopes, no significant flood plains occur on the propose segments of the river. There are approximately 73 acres of riparian wetlands along those segments. No endangered plant species are known to occur along the Mameyes River. Three sensitive plant species, *Laplacea portoricensis*, *Ternstroemia heptasepala*, and *Xylosma schwaneckeanum*, are known to occur in the area. The unique *Pterocarpus* forest occurs within the river corridor. Stands of this buttres-rooted tree are uncommon not only on the island but throughout the Caribbean. (source: Final EIS for the Revised Land and Resource Management Plan, Caribbean National forest and Luquillo Experimental Forest, Puerto Rico, 1997)

### **Rio de La Mina**

Because of steep gradients and dense network of ephemeral channels, no significant flood plains are found in the proposed segment. Approximately 33 acres of riparian stable wetlands occur along the proposed segment. One endangered plant species, *Callicarpa ampla* is known to occur along this segment. Five Sensitive plant species are known to occur within the proposed corridor: *Conostegia hotteana*, *Marlierea sintenisii*, *Psidium sintenisii*, *Ternstroemia heptasepala* and *Xylosma schwaneckeanum*. (source: Final EIS for the Revised Land and Resource Management Plan, Caribbean National forest and Luquillo Experimental Forest, Puerto Rico, 1997)

### **Rio Icacos**

There are 63 acres of flood plain conditions along the upper valley and approximately 37 acres of riparian wetlands along the proposed segment of the Rio Icacos. Endangered plants known to occur in the area are *Callicarpa ampla*, *Ilex sintenisii*, *Ternstroemia luquillensis*, and *Ternstroemia subsessilis*. The corridor provides unique habitats in which 15 species of Sensitive Plants are known to occur: *Brunfelsia portoricensis*, *Brachionidium cilolatum*, *Cordia wagnerorum*, *Eugenia eggersii*, *Laplacea portoricensis*, *Lindsaea stricta* var. *jamesoniiformis*, *Lepanthes dodiana*, *Lycopodium tenuicaule*, *Lycopodium wilsonii*, *Marlierea sintenisii*, *Myrica holdrigeana*, *Ravenia urbanii*, *Solanum woodburyi*, *Ternstroemia heptasepala* and *Xylosma schwaneckeanum*. The location and distribution of these sensitive plants has been mapped and periodically monitored. (source: Final EIS for the Revised Land and Resource Management Plan, Caribbean National forest and Luquillo Experimental Forest, Puerto Rico, 1997).

### **Scenery**

The scenic quality of each of the rivers is distinct and unique. Scenery is one of the river's outstandingly remarkable values. The rivers offer a unique ban of riparian life, an outstanding variety of landforms and vegetative patterns and

distinct water and geologic features. The effect related to scenery will be assessed within the WSR corridor.

Under the US Forest Service Scenery Management System the river systems are classified as a Distinctive Class A Landscape. Factors that influence this classification include land forms, vegetation patterns, water characteristics, topography of the land and foreground and background scenic views. Its not just the scenic views closes to the viewer but the panoramic view that appear periodically along the rivers. The current Forest Plan scenic values reflect the desire to maintain a high level of scenic integrity.

The headwaters of the Rio Icacos, Rio Mameyes and Rio de La Mina all occur in the upper elevations of the Forest in or near the Cloud Forest. The Rio Mameyes, Rio de La Mina and Rio Icacos have outstanding remarkable scenic values. The scenic qualities of landforms, vegetation, and streams within the WSR corridor are unique. The landforms are very steep with lush tropical vegetation. There is a variety of large boulders in the streams and along the banks. The Sierra Palm is the dominate Palm species at the headwaters of the three rivers. As the rivers meander down stream large native tree species begin to appear. There is a wide range of different shades of green which is generated by the vast amount of trees varieties that are found in the CNF. Water flows vary from the headwaters where the water flow is hardly noticeable. As the streams become rivers, the amount of water increases and the flow becomes faster as the terrain becomes very steep. Water cascades down along the large boulders which create pools and small waterfalls. Views of the river corridor can be seen from along the edges of forest roads, from within the watershed area, from the riverbank, and from within the river itself. The steep nature of the topography in the forest and the denseness of trees types and sizes makes panoramic viewing of the rivers very challenging. Do to the denseness of the vegetation there are no user created trails. There are some user created accesses to the rivers. The dense vegetation and its quick growth limits the width of the trails at certain points. It is because of this that the trails only accommodate hikers only.

### **Human Modifications**

Human modifications in the stream channel are identified as small vehicular and trail bridges. The entire length of the Rio Mameyes and Rio Icacos are free flowing with no artificial dams, channel diversions or other flow regulating structures. The Rio de la Mina has two water retention structures at Palo Colorado Recreation Area which are known as Baño Grande and Baño de Oro. These facilities were swimming pool areas constructed in the 1930's. The river flows under PR 191 at Km. 12.2 at the Palo Colorado Recreation Area

The Baño de Oro Trail (Trail #25) crosses Rio de la Mina about 100 meters below the rivers headwaters. Rio de la Mina has two trails that follow parallel to the river. In the Palo Colorado Recreation Area is Rio de la Mina Trail (Trail #12) which is in the Recreation Segment of the river. In the Scenic Segment of Rio de

la Mina, La Mina Trail (Trail #24) a historic trail built in the 1930's also runs parallel to the river. The Rio Mameyes passes under the PR 988 at Punte Roto, a developed recreation area with parking a trash cans and a trash bin. Access is provided to the rivers at these locations, otherwise, no substantial evidence of human activity is observed along the riverbanks.

An up-to-date inventory of in-stream structures will be compiled upon implementation of this CRMP and maintained thereafter. Existing cultural features are described in general terms in this document. The inventory of cultural and historic features on federal lands in the River Corridors will be updated over time.

### **Access**

The majority of the river corridors are accessible by road or trail. PR 191 is closed to traffic at Km.13.3 do to a major landslide at Km.19.3 in the late 1960's. Along this road is the Scenic Segment of the Rio Icacos. Vehicular use of this road is by authorized personnel. The road is also used by hikers and for dispersed camping. The Rio de la Mina is accessible by several trails that cross or run parallel to the river. The Palo Colorado Recreation Area is located within the recreation segment of the river. Rio Mameyes also has some trails that run parallel to the river. Its headwaters are near FR # 27 known as East Peak Road. There is only one major road crossing of the Rio Mameyes and it occurs on PR 988 at Puente Roto, which is an undeveloped recreation site.

### **Recreational Activities**

Viewing nature and wildlife, visiting recreation areas and historic sites (CCC projects) and hiking along the nature trails are the primary recreational uses in the Forest. Picnicking and primitive camping are also favorite recreation activities that occur in the forest. Water play along the rivers is very popular year round specially during the hot summer months. The Palo Colorado Recreation Area receives the heaviest recreation use. The heavy use is year-round and usually occurs during the long weekends and holidays of the summer months. During the week this area is at an average use level and is seldom crowded. This site has trails, picnic shelters, bathrooms, visitor information services, interpretive hikes and parking area.

Rio de la Mina runs through the picnic area and people enjoy getting into the river at this location. At the end of the recreation segment of Rio de la Mina is located La Mina Falls which is at the end of Big Tree Trail. This site is also heavily visited year round but mostly on weekends and holidays.

A different condition exist at Puente Roto which is a user created dispersed recreation site adjacent to the Rio Mameyes. Recreation activity at this location is very improvised because there is not a defined parking area and there is no facilities on site.

There is no boating or rafting on the rivers because they are too shallow and there are large boulders found through out the rivers. It is almost impossible to get any type of boat, raft, canoe or floating devise into the rivers because of the limited access space and steepness of the terrain near the recreation segments of the rivers. Fishing and hunting is not allowed in the Forest. The Forest is a passive recreation site where the natural setting is the dominate element and people come to enjoy and be a part of the lush and passive tropical rain forest setting.

### **Historic And Cultural Resources**

Typical heritage resources that might be encountered near the rivers include prehistoric petroglyphs, Spanish-era gold mines and coffee plantation sites, Civilian Conservation Corps (CCC) constructions, and historic farmsteads. The three river corridors each contain unique heritage resources. The Rio Icacos corridor has Civilian Conservation Corps projects and sites dating from the 1930s, including trails, work camps, PR Hwy, 191 as well as an earlier hydroelectric dam and penstock beyond the south end of the corridor. The Rio Icacos also has pre-Columbian petroglyphs located downstream from the river corridor, and the potential for others within exist. There is one rock shelter within the Rio Icacos corridor, which has Spanish Colonial ceramics in association with flaked stone tools.

The Rio de la Mina probably derives its name from a mid-1800s Spanish Colonial period mining complex located within the Scenic section, or from a possibly earlier mining complex further upstream within the Recreation section of the river. A series of homestead sites of the former community of Florida are located within the Scenic sector. La Mina Trail (Trail #24) and most of the facilities in the Palo Colorado Recreation area including Baño de Oro and Baño Grande Bath House and Pools, Palo Colorado Picnic Area, several trails, highway PR191, and the now the defunct El Yunque Pavilion – all were constructed by the CCC in the 1930's; they are located within the Recreation sector of the Rio de la Mina corridor.

The Rio Mameyes also has homestead sites dating to the 1930's or earlier within the Scenic sector of the corridor. There is at least one abandoned house site within the Wild section of the upper Rio Mameyes, and several others within the Recreation sector.

All three river corridors have high potential for as yet undiscovered heritage resources, particularly prehistoric petroglyph sites, Spanish Colonial period gold mines, 1900's homesteads, and additional features from the CCC years.

## **Appendix B: Applicable Laws, Regulations, and Plans**

This is a summary of most applicable laws, regulations, and plans that affect the management of the CNF National Wild and Scenic River Corridors. These may change over time or some direction may be added or eliminated.

### **Section 7 of the Wild & Scenic Rivers Act**

Section 7 is one of the most important and powerful parts of the 1968 Wild and Scenic Rivers Act (WSRA). This key provision directs federal agencies to protect the free-flowing condition and other values of designated rivers and congressionally authorized study rivers. Through the language of Section 7 of the WSRA, Congress expressed the clear intent to protect river values from the harmful effects of federal water resources projects.

More specifically, the WSRA prohibits the Federal Energy Regulatory Commission (FERC) from licensing the construction of hydroelectric facilities on rivers that have been designated as components of the National System. Further, the WSRA prohibits other federal agencies from assisting in the construction of any water resources project that would have a direct and adverse effect on a designated river. The WSRA also includes a standard that governs federal water resources projects below or above a designated river. Determinations under Section 7(a) or 7(b) of the WSRA as to the severity of the impacts of federal water resource projects are made by the river-administering agency; in the case of the Rio de la Mina, Rio Mameyes and Rio Icacos, the administering agency is the US Forest Service (USFS).

The USFS has developed definitions for “water resources projects” that are accepted by the other wild and scenic river administering agencies. Water resources projects include any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the federal Power Act, or other construction of developments, which would affect the free-flowing characteristics of a wild and scenic river. In addition to projects licensed by the FERC, water resources projects may also include: dams; water diversion projects; fisheries habitat and watershed restoration or enhancement projects; bridges and other roadway construction or reconstruction projects; bank stabilization projects; channelization projects; levee construction; recreation facilities such as boat ramps and fishing piers; and, activities that require a 404 permit from the Army Corps of Engineers (ACOE). It is important to note that Section 7 review is limited solely to federal water resources projects.

## **Section 404 of the Clean Water Act**

Section 404 of the Clean Water Act requires the ACOE to regulate disposal of dredged or fill material in “waters of the United States”—a much broader term than the “navigable waters” of Section 10 jurisdiction. Section 404 covers traditionally navigable waters, tributary streams, and wetlands. Most major activities on these lands would require a permit from the ACOE. As defined by the river-administering agencies, ACOE permits are considered to be “federal assistance” under Section 7 of the WSRA. As such, ACOE permit applications for activities in wild and scenic rivers are subject to the provisions of Section 7. A permit from the ACOE will require a Section 7 determination by the river-administering agency when the proposal occurs in a designated river and is a water resources project, i.e., affects the river’s free-flowing condition. The ACOE process requires a written determination from the river-administering agency for such projects.

Most major actions within the river corridor that could alter the free-flowing character of the river, or negatively impact the Outstandingly Remarkable Values, would require a permit from the ACOE, which would trigger a review by the river-administering agency for compliance with Section 7 of the WSRA.

## **Section 10 and Section 404 Permits and Fish and Wildlife**

While the ACOE is ultimately responsible for issuance of permits under Section 10 and Section 404, the Fish and Wildlife Coordination Act requires that the ACOE consult with the US Fish and Wildlife Service (USFWS) and state fish and wildlife agencies about possible adverse impacts to aquatic life from waterway development. The National Marine Fisheries Service (NMFS) is also involved in this permit review, to ensure that fish and wildlife are considered equally with other factors when determining the suitability of waterway projects. The USFWS also makes broad-ranging recommendations on mitigation needed to compensate for unavoidable adverse impacts. While recommendations of these agencies have significant influence on permit decisions, the ACOE has final authority.

The ACOE is also required to consult with the USFWS if an endangered species may be impacted by an activity. The USFWS prepares a separate biological opinion, and the activity may not be authorized unless it is determined that the project is not likely to jeopardize the continued existence of the species or result in the destruction of the habitat of the species.

## **Endangered Species Act**

As mentioned in the threatened and endangered species section, PETS (proposed, endangered, threatened and sensitive species) are managed cooperatively with the PR Department of Natural Resources and the Environment.

Under the Endangered Species Act, the federal government must develop restoration plans for listed species and must take no actions to further endanger these species. This, in theory, should preclude federal actions, which would harm these Outstandingly Remarkable resources, and should provide for further habitat protection, which is consistent with wild and scenic river designation.

## **Appendix C: List Of Implementation Priorities**

Section IV of this CRMP establishes the criteria used to guide subsequent site-specific agency projects within the corridor. This appendix identifies an initial list of potential projects. Because the amounts and types of funds are not always predictable, it is not possible to set rigorous priorities for expenditures over the long term and it is necessary to adjust priorities from year to year. This initial list of actions can be updated as needed without amending the CRMP.

### **Priorities**

Priority of Actions will be addressed in the following order:

- Monitor water quality along the three rivers to include Quebradas Juan Diego and La Coca
- Program doing a LAC study for recreation segments of the rivers.
- Improvements or actions within the corridor that meet the direction of the CRMP
- Improvements or actions within the Watershed that enhance the corridor and meet the direction of the CRMP

### **On-going Actions**

- Develop baseline inventories for:
  - Cultural Features/Sites
  - Water Quality
  - Exotic Species
- Consider designation of campsites in some areas
- Enhance vista opportunities

### **Short-term Priority Actions**

- Develop interpretation/information at La Mina Falls, Puente Roto and other places ....(consider kiosks, etc)
- Implement "Pack-it-in & Pack-it-out" and "Leave No Trace" programs to meet goals of CRMP
- Monitor water quality along the three rivers.
- Delineate and improve parking area at Rio Mameyes Puente Roto site to meet goals of CRMP
- Conduct a LAC study for La Mina Falls and Puente Roto

### **Long-term Priority Actions**

- Provide a variety of interpretation to include biological and cultural themes
- Outfitter permit system for Rio de la Mina Trail



## Appendix D: Existing CNF Forest Plan - Wild and Scenic Rivers

Pages 4-47 to 4-50 of the 1997 Revised Land and Resource Management Plan for the Caribbean National Forest

### Wild and Scenic Rivers (Forest Wide Management Direction)

<b>Desired Future Condition</b>	River segments recommended for designation as Wild, Scenic or Recreation have been formally designated by Congress. Management plans which emphasize protection of the rivers and their outstandingly remarkable values are developed and implemented.
<b>Goals</b>	Manage recommended river segments to preserve their outstanding remarkable values that make them eligible. (See also Management Area 9)

Table 4-3. Wild, Scenic and Recreation River Recommendations		
River	Classifications	Length Miles
Río Mameyes	Wild	2.1 miles
	Scenic	1.4 miles
	Recreation	0.9 miles
Río La Mina	Scenic	1.2 miles
	Recreation	0.9 miles
Río Icacos	Scenic	2.3 miles

Manage these rivers in such a manner as to protect and enhance the values for which they were found eligible for designation.

Wild segments will be kept free of impoundments, accessible only by trail. Maintain shorelines in an essentially primitive condition (free of structures and modifications of the waterway such as rip-rapping and channelization). Maintain current water quality.

Scenic segments will remain free of impoundments, have largely primitive shorelines, and be accessible only at certain points by trails.

Recreation segments may be paralleled by roads, have some development along shorelines, and have low intensity impoundments or diversion works, provided the waterway and its surroundings are generally natural in appearance.

## Standards and Guidelines

- S 1. Develop management plans with specific management requirements for designated rivers after designation. Pattern specific directions after the generic management direction in Chapter 8.2 of the Land and Resource Management Planning Handbook (FSH 1902.12). Pending designation and the subsequent development of a river management plan(s), the following management direction will be implemented to ensure protection of the qualities that make the rivers eligible.

### Wild Rivers

#### ***Timber***

- S 1. Cutting of trees is not permitted except when needed in association with a primitive recreation experience (such as clearing for trails and protection of users) or to protect the environment (such as control of fire).

#### ***Water Supply***

- S 2. All water supply dams and diversions are prohibited.

#### ***Hydroelectric Power***

- S 3. No development of hydroelectric power facilities is permitted.

#### ***Flood and Erosion Control***

- S 4. No flood control dams, levees, or erosion control work is allowed.

#### ***Road Construction***

- S 5. No roads or other provisions for overland motorized travel are permitted within 1/4 mile of the riverbank.

#### ***Recreation Development***

- S 6. Major public-use areas, such as large picnic areas, interpretive centers, or administrative headquarters are located outside the Wild Rivers area. Recreation developments are limited to trails and unobtrusive bridges and signs, and improvements necessary for resource protection.

#### ***Structures***

- S 7. A few existing structures could be allowed assuming such structures are not incompatible with the essentially primitive and natural values of the river and its corridor. New structures are not allowed except in rare instances to achieve management objectives (e.g. structures and activities associated with fisheries enhancement programs could be allowed).

## Scenic Rivers

- |                                  |      |  |
|----------------------------------|------|--|
| <b>Timber</b>                    | S 1. | Timber demonstration is located at least 1/4 mile away from rivers suitable for Scenic River designation. Vegetation treatments for wildlife habitat improvement is allowed provided that such practices are carried on in such a way that there is not substantial adverse effect on the river and its immediate environment. The river should be maintained in its near natural environment. |
| <b>Water Supply</b>              | S 2. | All water supply dams and major diversions, that would have a direct and adverse effect on the values for which the river area is included in the National System, are prohibited. Modest diversions are allowed only if there would be no direct and adverse effect on river values.  |
| <b>Hydroelectric Power</b>       | S 3. | No development of hydroelectric power facilities is allowed.   |
| <b>Flood and Erosion Control</b> | S 4. | Flood control dams and levees are prohibited. Erosion control treatments can be implemented if they do not detract from river values.  |
| <b>Road Construction</b>         | S 5. | Roads should generally not be visible from the rivers suitable for Scenic River designation. No new road construction is permitted within 1/4 miles of such rivers.  |
| <b>Recreation Development</b>    | S 6. | Larger scale public use facilities, such as large picnic areas, public information centers, and administrative headquarters are well screened from rivers suitable for Scenic River designation. Modest and unobtrusive recreation facilities are permitted.   |
| <b>Structures</b>                | S 7. | New structures that would have a direct and adverse effect on river values are not allowed.  |

## Recreation Rivers

- |                                  |      |   |
|----------------------------------|------|---|
| <b>Timber</b>                    | S 1. | Timber demonstration is located at least <sup>1</sup> / <sub>4</sub> mile from rivers suitable for Recreation River Designation. Vegetation treatments for wildlife habitat improvement are allowed provided that such practices are carried on in such a way that there is not substantial adverse effect on the river and its immediate environment. Woody debris is allowed to remain along the river bed and its banks. |
| <b>Water Supply</b>              | S 2. | Low dams, diversion works, rip rap, and other minor structures are allowed provided the waterway remains generally natural in appearance.   |
| <b>Hydroelectric Power</b>       | S 3. | No development of hydroelectric power facilities is allowed.  |
| <b>Flood and Erosion Control</b> | S 4. | Flood control dams and levees are prohibited. Erosion control treatments can be implemented if they do not detract from river values.   |
| <b>Road Construction</b>         | S 5. | Paralleling roads could occur on one side of the river. There can be several bridges crossings and numerous river access points. New road construction is limited to access and parking for developed recreation sites.   |
| <b>Recreation Development</b>    | S 6. | Picnic areas and trails constructed may be in close proximity to the river.   |
| <b>Structures</b>                | S 7. | New structures are allowed for recreation use.  |

## Appendix E: Existing CNF Forest Plan - Management Area 9

Page 4-104 of the Revised Land and Resource Management Plan for the Caribbean National Forest

---

### Management Area 9 – Wild, Scenic and Recreation River Corridors

#### Desired Future Condition

This management area is established to provide increased protection for river segments recommended for Wild, Scenic or Recreation River designation, where these rivers are outside other highly protective management areas (Wilderness and Research Natural Areas).

These rivers and their corridors continue to exhibit the outstandingly remarkable characteristics that made them eligible for Scenic or Recreation River designation.

#### Goals

The Río Icacos remains free of impoundments above the existing hydroelectric facilities. Improve water quality of the Icacos by reducing sedimentation from landslides and PR 191.

Improve recreation opportunities and water quality on the Río Mameyes by providing recreation facilities at Puente Roto.

Provide opportunities for treatment vs. control research to the extent such use does not detract from Scenic or Recreation River qualities. Recognize that the Rio Icacos corridor includes forest and soil types not available for experimental use elsewhere on the Forest.

#### Standards and Guidelines

##### Río Icacos

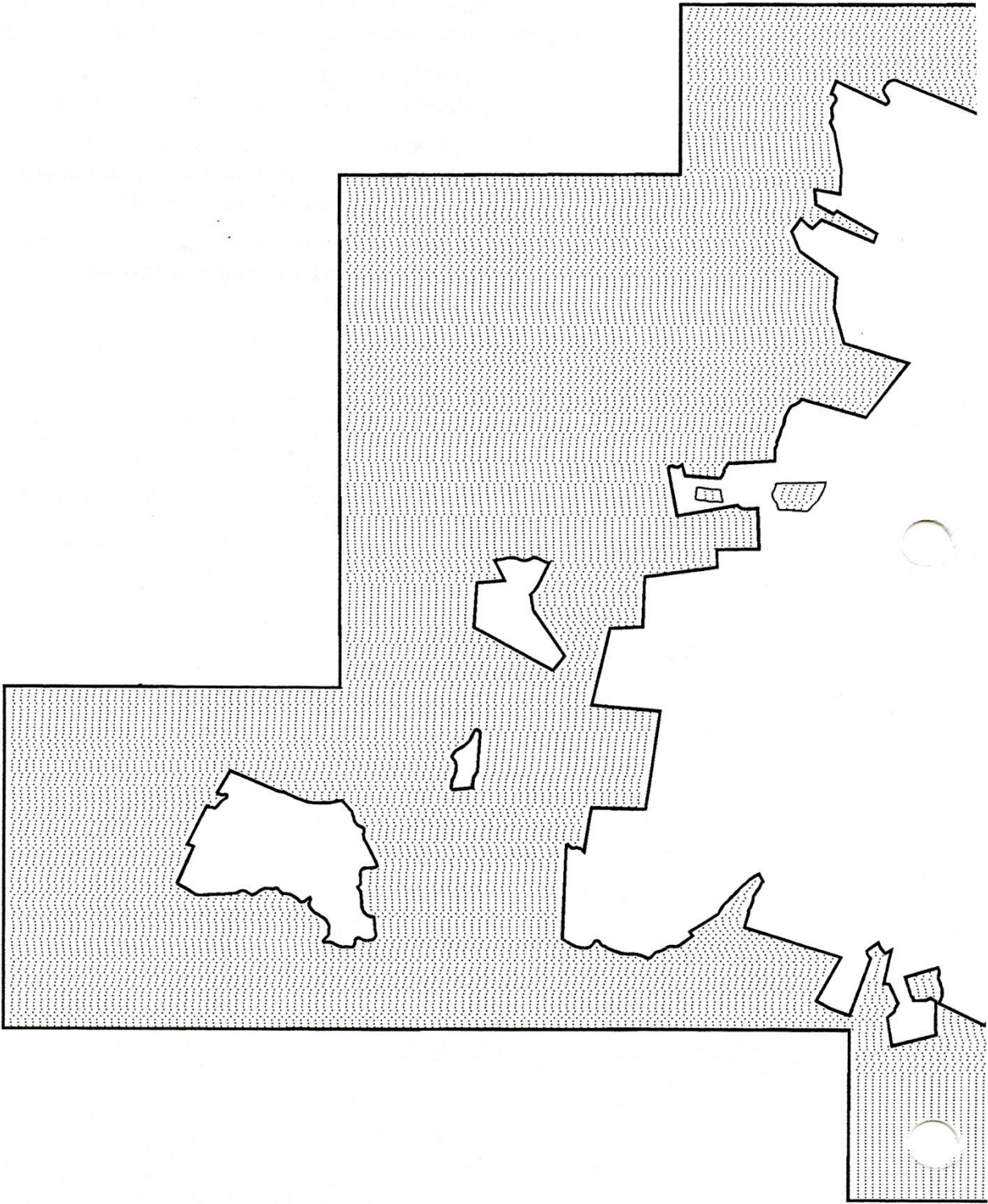
- S** 1. Maintain ditches and culverts on the section of PR 191 closed to public traffic so as to reduce the incidence of concentration of water flow onto slopes prone to landslides.
  
- S** 2. Stabilize areas of exposed soil caused by landslides as described in

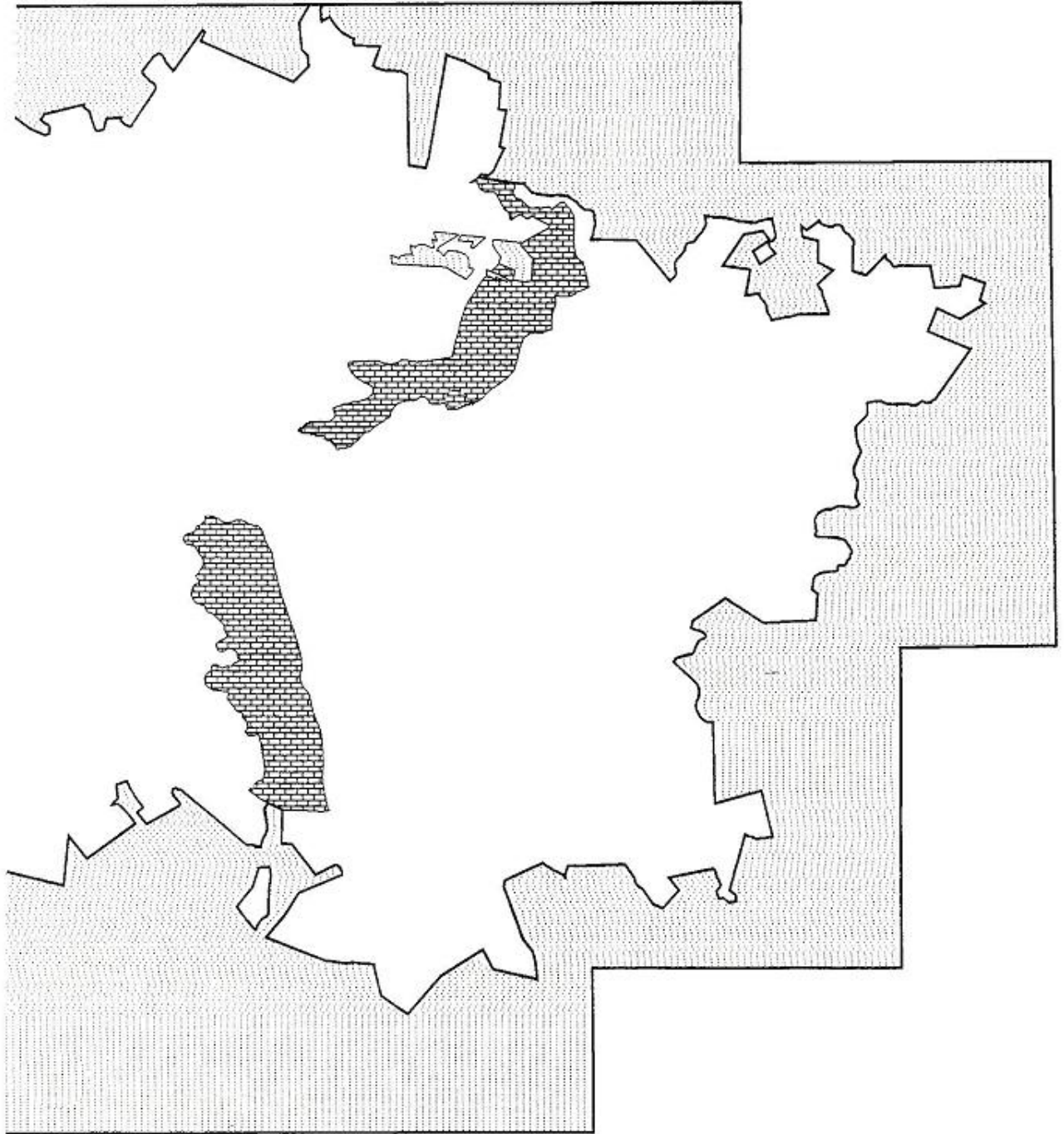
the watershed protection standards and guidelines.

**Río Mameyes**

- G** 1. Complete project design and NEPA analysis for a picnic area at Puente Roto. Reduce water quality impacts and improve recreation experience by providing improved parking, trails, garbage collection and toilets, to the extent funding permits.

**FIGURE 4-10. MANAGEMENT AREA 9 - WILD/SCENIC/RECREATION RIVER CORRIDORS**  
**GRAFICA 4-10. ZONA DE MANEJO 9 - CORREDORES DE RÍOS SILVESTRES/PANORÁMICOS/RECREACIONALES**







## Appendix F: Existing CNF Forest Plan Monitoring

Page 5-22 of the Revised Land and Resource Management Plan for the Caribbean National Forest

<b>Table 5-1. Monitoring the Desired Future of the Forest*</b>				
<b>Monitoring Item and Desired Future</b>	<b>Indicators of Desired Future</b>	<b>Item Measured Measurement Technique</b>	<b>Threshold of Acceptable Change</b>	<b>Monitoring/ Reporting Period</b>
<b>Wild, Scenic and Recreation Rivers</b>				
Designated Wild, Scenic and Recreation river segments are managed to retain their qualifying attributes.	Development does not change characteristics of river segments to below standards for designated class.	Proposed management practices within wild, scenic and recreation corridors are evaluated as part of project planning process.  (E)  Visual confirmation that VQO of preservation is met for segments eligible for Wild and scenic designations, and VQO of retention is met for segments eligible for Recreation designation. (E)	VQO's not met.	Monitor continuously; report annually.  Same as above.
Abbreviations: I = Implementation monitoring E = Effectiveness monitoring V = Validation monitoring				

\* Monitoring Indicators, Standards, and Actions Table on page 31-32 would be part of the Monitoring guidelines to be implemented in the Forest Plan.

## Appendix G: List of Preparers

### Interdisciplinary Team

**Jose R. Ortega – ID Team Leader, Recreation Program Leader.** He has a Bachelors Degree in Landscape Architecture from Kansas State University and has 19 years of experience with the Forest Service. He has worked as the Forest Landscape Architect and has participated in numerous Forest recreation projects and ID Teams.

**Pedro Rios – Ecosystems Team Leader.** He has a Bachelors Degree in Agriculture from the University of Puerto Rico at Mayaguez and a Masters Degree in Forestry from North Carolina State University. He has over 20 years of experience with the Forest Service.

**Felipe Cano – Forest Biologist.** He has a Bachelors Degree in Wildlife Sciences from the University of Arizona and has 8 years of experience with the Forest Service. He has worked for the Forest Service in Arkansas, Tennessee and Utah.

**Jeff Walker – Archeologist.** He has Ph.D. in Anthropology from Washington State University and has over 20 years of experience with the Forest Service. He has also worked for the Forest Service in Oregon and Idaho as an Archeologist; has extensive experience in Cultural Resource Management and was State Archeologist for the Puerto Rico State Historic Preservation Office. His area of expertise is lithic technology of the Caribbean.

**Luis A. Rivera – Forester.** He has a Masters Degree in Biology Education from the University of Puerto Rico, Rio Piedras Campus and a Master Degree in Forestry from Yale University at New Heaven, Connecticut. Has over 20 years of experience with the Forest Service in the Caribbean National Forest.

**Fernando Perez – Hydrology Trainee.** He has a Bachelors Degree in Natural Sciences from the University of PR, Cayey campus. He has 2 years of experience with the Forest Service on the Caribbean National Forest.

**Blanca Ruiz – Interpretive & Conservation Education Program Manager.** She has a Masters Degree in Planning; a Master's Degree in Social Work and a Bachelor's Degree in Education, all from the University of Puerto Rico, Río Piedras. She has worked for the DNER of Puerto Rico. She has also worked as an Assistant Professor in the Graduate School of Social Work of the University of Puerto Rico and as a private consultant in planning and social research. She has worked for the last 14 years with the Caribbean National Forest.

### **Technical Assistance and Support**

Manuel Ortiz – CNF Customer Service and Property Team Leader

Carolyn Pabon – CNF Planning and Administrative Team Leader

Carolyn Krupp – CNF Special Uses and Lands

Angel Tosca – CNF Office Automations Clerk

Aurea Moragon – CNF Web Site Manager

Deborah Caffin – R8 Wilderness and Dispersed Recreation Specialist

Jackie Diedrich – National Wild and Scenic Rivers Specialist

Paul Arndt – R8 Regional Planner

Myrna Tirado – CNF Information Receptionist

### **Public Involvement**

Public involvement for the CNF Comprehensive River Management Plan began with a public notice and a scoping letter dated April 11, 2005. The letter was mailed to state and federal agencies, Mayors of the municipalities that border the Forest and environmental groups.

The scoping letter was made available to the general public on the Forest internet Web site at [www.fs.fed.us/r8/caribbean](http://www.fs.fed.us/r8/caribbean) . Information was updated as the EA process progressed.