

SUMMARY

Rock Creek Park was established on September 27, 1890 as the fourth federal park created by Congress. The main unit of Rock Creek Park, known as Reservation 339, was created for the scenic and recreational enjoyment of the people of the United States. When the park was established, it was on the edge of the growing city of Washington D.C., and was already a favorite area for rural retreat. The park would “provide for the preservation from injury or spoilation of all timber, animals, or curiosities within said park, and their retention in their natural condition, as nearly as possible.” Since its establishment in 1890, additional properties were added to Rock Creek Park and today the park is composed of 99 separate reservations, also referred to as units, located throughout Washington, D.C. The largest of the 99 reservations is Rock Creek Park (Reservation 339), which consists of 1,754 acres of Rock Creek and the surrounding valley from the Maryland state line south to the National Zoo. Other park units include the Rock Creek and Potomac Parkway (Reservation 360), Glover-Archbold Park (Reservation 351 and 450), Fort Reno (Reservation 470 and 515), Fort Totten (Reservation 544), and Meridian Hill Park (Reservation 327), to name a few.

The purpose of the Wireless Telecommunication Facility Plan / Environmental Assessment (plan/EA) is to provide all administered units of Rock Creek Park with a consistent framework for protecting park resources during the consideration of “right-of-way permit” applications and other inquiries submitted to the park for the construction, operation, and maintenance of wireless telecommunication facilities (WTF). The scope of this plan is limited to addressing WTF related to the provision of wireless telecommunications services, such as cellular phones. This plan is narrowly tailored so as to respond to the legal authorities governing placement of WTF on parkland, which contain some significant differences from those for these other technologies and therefore, other types of technologies, such as WiFi, radio, and television, are not addressed.

A WTF plan/EA is needed at this time to:

- Meet the conditions of the 2003 *Rock Creek Park Telecommunication Facilities EA Finding of No Significant Impact* (FONSI), which states the National Park Service (NPS) will develop and adopt a telecommunication facilities plan to assist the park in future decision-making regarding potential WTF permit applications.
- Provide a consistent and coordinated process for considering right-of-way permit applications for WTF use throughout Rock Creek Park administered units and assist the park with the protection of natural and cultural resources, human health, visitor safety, and visitor experience.
- Satisfy the National Capital Planning Commission (NCPC) requirement that a plan for evaluating right-of-way applications for WTF in Rock Creek Park be in place before the NCPC considers any renewals of the existing WTF in the park.

OBJECTIVES IN TAKING ACTION

Objectives were developed for the WTF plan/EA for all units of Rock Creek Park in accordance with NPS Directors Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001). Under Directors Order #12, an objective is a statement of goals to meet the purpose and need for action. The objectives of a plan must be achieved to a large degree for the action to be considered a success (NPS 2001). All alternatives selected for detailed analysis must meet project objectives to a large degree, and resolve the purpose of and need for action. Objectives must be grounded in the park’s enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and

guidance provided by the park's general management plan (GMP), strategic plan, and/or other management guidance. The objectives of the WTF plan/EA are provided below.

Management Methodology

- Provide the foundation for decision-making regarding the issuance of right-of-way permits for the provision of WTF within Rock Creek Park administered units.
- Establish criteria for determining where WTF would or would not be appropriate in Rock Creek Park.
- Provide guidance on how the park can meet the requirements set out in the Telecommunications Act of 1996, the 1995 Presidential Memorandum, and government-wide procedures, and relevant NPS laws, regulations, and policies as they relate to the processing of applications and the authorization of citing, installation, operation, and maintenance of WTF.
- Determine management measures for the installation, operation, and maintenance of WTF that can be implemented to protect the park's cultural and natural resources.
- Serve and maintain the management prescriptions and goals outlined in the Rock Creek Park and the Rock Creek and Potomac Parkway Final GMP and Record of Decision (ROD) as they relate to the installation, operation, and maintenance of WTF. This plan states that only telecommunication structures that do not jeopardize the park's mission and resources may be permitted within the park.

Wildlife And Wildlife Habitat

- Incorporate best available research related to the construction, operation, and maintenance of WTF and the effect on wildlife and wildlife habitat, specifically migratory birds.
- Specify wildlife and wildlife habitat resource conditions to be protected and maintained at all Rock Creek Park administered units as related to the installation, operation, and maintenance of WTF.

Cultural Resources

- Specify cultural resource conditions to be protected and maintained at all Rock Creek Park administered units as related to the installation, operation, and maintenance of WTF.
- Protect those features contributing to the historic designed landscape of all Rock Creek Park administered units.

Health and Safety

- Ensure public safety within the park.
- Protect the health and safety of park employees and visitors from exposure to radiofrequency emissions from WTF.

Land Use

- Communicate and coordinate with adjacent property owners, existing land use plans and policies affecting the area, federal commissions such as the NCPC and the Commission of Fine Arts (CFA), and other local entities and authorities during the development and implementation of a WTF plan/EA.

BACKGROUND AND SUMMARY OF WIRELESS TELECOMMUNICATION FACILITIES IN ROCK CREEK PARK

The Telecommunications Act of 1996 was enacted “to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies” [Public Law No. 104-104, 110 Stat. 56 (1996)]. The Telecommunications Act of 1996 addresses, among many other important subjects, some of the technical problems that have arisen from the increasing popularity of mobile communications. President Clinton’s memorandum of August 10, 1995, entitled “Facilitating Access to Federal Property for the Siting of Mobile Services,” directs federal agencies to develop procedures necessary to facilitate access to federal property for the siting of mobile services antennas.

Section 704(c) of the Telecommunications Act of 1996 and its regulations, and the GSA Bulletin FMR 2007-B2 (which replaced FRMR D-242), Placement of Commercial Antennas on Federal Property, make federal property, including parkland, available for placement of telecommunications equipment by duly authorized providers absent unavoidable conflicts with the department or agency’s mission, or the current or planned use of the property, or access to that property. The specific NPS guidance and procedures are contained in Director’s Order #53, Special Park Uses, and its accompanying reference manual, Resource Manual 53 (RM-53). The NPS general authority to issue right-of-way permits for power and communications facilities is in 16 USC § 5, with the regulations at 36 Code of Federal Regulations (CFR) Part 14.

With the number of wireless telecommunication devices in the U.S. on the rise, there is an increasing demand for more infrastructure to support this service. The increasing demand for service can be seen by the estimated number of wireless subscribers growing from 44,042,992 in 1996, to 233,040,781 ten years later in 2006 (CITA 2006).

There are two WTF currently located in Rock Creek Park. On April 15, 1998, Bell Atlantic Mobile, Inc. (now Verizon Wireless) submitted separate applications to the NPS for right-of-way permits to construct, operate, and maintain two WTFs within Rock Creek Park, Washington, D.C. The proposed facilities included a monopole, antennas, and supporting infrastructure to be constructed within the Rock Creek Park tennis center complex on the east side of the park and in the park’s maintenance yard on the west side. As a result of the permit application, pursuant to the National Environmental Policy Act (NEPA), an environmental assessment (EA) was prepared by the NPS, National Capital Region to analyze the potential impacts of the proposed facilities on the resources of Rock Creek Park (NPS 1999a).

The NPS initially concluded in an EA that the facilities would not have significant impact on the quality of the human environment and, on March 2, 1999, the NPS issued this finding, which was revised on April 7, 1999. Following a series of meetings before the Commission of Fine Arts and the NCPC, the NPS issued a right-of-way permit on November 8, 1999, to Bell Atlantic Mobile, Inc., authorizing the construction of the monopole-mounted wireless telecommunication antennas and supporting infrastructure at the Rock Creek Park tennis center and the maintenance yard. The facilities went into service on March 15 and 17, 2000 and remain in operation today.

The Audubon Naturalist Society of the Central Atlantic States, along with private individuals, filed suit in 2000 challenging the NPS decision to grant Bell Atlantic Mobile, Inc. the right-of-way permits. The plaintiffs claimed that the NPS violated NEPA by relying on a legally insufficient EA, which led the NPS to erroneously issue a FONSI and grant the permits. On July 2, 2002, the U.S. District Court for the District of Columbia found the EA was insufficient and required the NPS to complete a new EA for the facilities. The EA was revised and a revised FONSI was signed on June 16, 2003.

The 2003 FONSI allowed the wireless telecommunications facilities to remain in the park with additional mitigation applied to protect park resources and values. The selected alternative allows for the continued operation and maintenance of the two facilities, respectively, as currently permitted, but requires the NPS to:

1. Develop and adopt a WTF plan to assist the park in future decision-making regarding potential WTF permit applications. The planning process is to include public scoping and comment, analysis of a range of alternatives for future placement of facilities, and a decision document.
2. Seek funds to develop and adopt a program to monitor the impact of the existing WTF on migratory birds. This monitoring program was developed in cooperation with the U.S. Fish and Wildlife Service, other agencies, and interested parties, and is currently in the second year of a three-year study. Should the monitoring program disclose effects to migratory birds from the monopole towers or appurtenant structures, the NPS will conduct additional coordination with the U.S. Fish and Wildlife Service to determine necessary steps to address the issue.

The right-of-way permits for the existing WTF at Rock Creek Park were renewed in October 2005. During this renewal process, the NCPC approved the renewal of the two WTF, but stated that, among other things, a plan for future WTF siting in the park needed to be complete before the NCPC would consider another renewal.

ALTERNATIVES CONSIDERED

This EA evaluates three alternatives for a WTF plan/EA for all Rock Creek Park units. A summary of the alternatives follows.

ELEMENTS COMMON TO ALL ALTERNATIVES

The following elements would be common to all alternatives, including the no-action alternative:

- All applications would be subject to compliance with the applicable laws, regulations, policies, and guidelines outlined in “Chapter 1: Purpose of and Need for Action.” This includes following the application process set out in RM-53, and complying with the NCPC and CFA review processes.
- Co-location on the two existing monopoles would be evaluated as detailed in the existing permits. These permits state, “The Permittee will allow any future wireless telecommunications provider approved by the NPS to co-locate on the Permittee’s antenna monopoles so long as such co-location does not interfere with the Permittee’s existing use of the Property.” The permit requires those wishing to co-locate to submit an application with the NPS and complete the application process outlined in RM-53, including completion of the NEPA and the National Historic Preservation Act (NHPA) processes to ensure no unacceptable impacts to park resources would occur.
- The term “coverage” refers to the desired level of service in an area that provides what is termed as “in-car” coverage. Although an area may currently have coverage for pedestrians, if it does not provide in-car coverage, it is considered to have a coverage gap. Under this level, users on foot and in a car would have service, but those in buildings may not.
- The use of the term “infrastructure” refers to the utilities required to support a WTF. In the case of WTF, infrastructure would include buried electric lines to provide power to the facility and

buried fiberoptic cable to provide the wireless service. All associated cables for WTF (electrical, telephone, and fiber optic) must be buried and cannot be above ground.

- The use of the term “associated structures” refers to the support structure that holds the antenna, the equipment building and its contents, and any other structure required for the operation of the WTF.
- No fencing would be permitted around WTF and their associated structures in order to minimize impacts to the cultural landscapes and historic districts located throughout Rock Creek Park units. Part of the legislative purpose of Rock Creek Park is to “preserve and perpetuate for this and future generations the ecological resources of the Rock Creek valley within the park in as natural a condition as possible, the archeological and historic resources in the park, and the scenic beauty of the park.” Because an integral part of the park’s mission is related to the aesthetic value and scenic beauty of the park, allowing fencing around WTF would be contrary to the park’s mission.
- Applications must include an analysis of locations outside the park that could provide similar levels of service.
- Permits would be granted only for WTF using the newest technology, following the intent of all applicable authorities to facilitate the build out of new WTF service, and conforming to the NPS Management Policies 2006 direction to require the “best technology available.” Under Section 8.6.4.3, “traditional” towers, such as monopole or lattice structures, should be approved only after all other options have been explored. The management policies further state that consideration should be given first to co-locating new facilities, constructing new towers that are camouflaged to blend with their surroundings, and installing micro-sites.
- WTF would be subject to the USFWS guidance on siting such facilities, and would not be permitted in a breeding bird census area, an area of sensitive habitat, or in a place that would impact historic resources. Applications may be subject to additional requirements based on the ongoing study, “The Effect of Cell Towers on Birds and Bats at Rock Creek Park.” Should the study find impacts related to WTF located in migratory flyways, WTF would no longer be permitted to site in these areas.
- WTF right-of-way permits would not be granted for certain areas of the park because of desired conditions stated in the park’s GMP and other applicable management documents. These areas are identified in each unit’s relevant planning documents (detailed below), and the reasons prohibiting WTF in them, include:
 - **Forest Zone** (managed under the GMP for Rock Creek Park and Potomac Parkway): In accordance with the GMP, no new roads or utilities would be established in these areas, making them inaccessible for the construction, operation, and maintenance of WTF. Siting of WTF in the Forest Zone could result in loss and fragmentation of forest habitat, adverse impacts to habitat for sensitive species, introduction of non-native species, adverse impacts to visitor use within the Forest Zone, the potential for adverse impact to archeological resources, and adverse impacts to the trail circulation system, a contributing resource on the National Register nomination. The Forest Zone includes the seeps and springs in Rock Creek Park that are home to sensitive and threatened amphipod species. Any development in this area could be detrimental to these species. See also NPS Management Policies 2006, Section 8.6.4.3, “...ensuring that facilities and their supporting infrastructure...are not located in scenic, historic, and/or sensitive areas integral to the park’s mission”; Section 4.1, “the NPS will strive to understand, maintain, restore, and protect the inherent integrity of the natural resources, processes, systems and values of the parks while providing meaningful and appropriate opportunities to enjoy them.”

- **Park Road Zone** (managed under the GMP for Rock Creek Park and Potomac Parkway): The Park Road Zone includes all paved roads, other than Beach Drive and the Rock Creek and Potomac Parkway, that are owned and maintained by the NPS and are open to automobile use by the public. The zone is a narrow corridor that includes the road surface, shoulders, and associated pullouts, parking areas, and paved trails. These corridors provide scenic driving, as well as pedestrian and bicyclist access, to park recreational and interpretive facilities. These roads run through the Forest Zone, and many have been identified as cultural resources. The GMP states that all roads, recreational trails, and associated facilities are managed to complement the natural setting and historic road design. Because these roads are directly adjacent to areas designated as Forest Zone and are required to be managed to retain their cultural resource importance under the GMP, WTF would not be permitted in this zone for the same reasons as detailed for the Forest Zone.
- **Fort Circle Parks** (managed under the Fort Circle Parks GMP): Facilities may be sited in the park areas that connect the fort sites under all alternatives; however, if these areas can be seen from the forts, the applicant must show that the facilities would not have a negative impact on the historic property. No facilities are to be placed within the fort sites. The forts are listed on the National Register of Historic Places and placement of facilities at these sites would be contradictory to NPS *Management Policies 2006* and the NHPA. The Fort Circle Parks were established to conserve the linkage of urban green spaces that contribute to the character and scenic values of the Nation's Capital. Placement of WTF in these units would impact the character and scenic value that these parks were established to protect. Although WTF could be sited in some units of Rock Creek Park with cultural resources under all alternatives, the size and location of the Fort Circle Parks would make any facility difficult to conceal, resulting in a greater potential for impacts to these protected resources in these parks than other Rock Creek Park units. Further, the Fort Circle Parks GMP sets out desired visitor experiences at these sites, which influences future land uses. These desired experiences include interacting with cultural and natural resources in ways that do not damage or derogate those resources and provide safe, satisfying experiences; learning about or simply enjoying the diversity of the sites' natural resources; and appreciating the vulnerability of the sites' natural and cultural resources to human activities inside and outside park boundaries. Granting permits for WTF at the fort sites would therefore also be in conflict with planned uses of the land.
- **Dumbarton Oaks** (site uses determined by the Cultural Landscape Report: Dumbarton Oaks): Dumbarton Oaks is listed on the National Register of Historic Places; therefore, siting WTF within Dumbarton Oaks would be contrary to NPS *Management Policies 2006*, which calls for the protection of cultural resources, and the NHPA. In accordance with Section 8.4.6.3 of the NPS *Management Policies 2006*, WTF should not be sited in scenic, historic, and/or sensitive areas integral to the park's mission. Areas that are listed on the National Register are considered to be scenic, historic, and sensitive. Management of this park unit is guided by the Cultural Landscape Report: Dumbarton Oaks (2000). This report states that the landscape of Dumbarton Oaks retains a high degree of integrity. This park unit consists of only 27 acres, and the placement of any non-contributing structure, such as a WTF, would have adverse impacts. In such a small area, a WTF could not be concealed to address any potential impact and would, in effect, alter the historic character of the site. Placement of WTF at Dumbarton Oaks would alter the characteristics of this landscape and the features that make it eligible for listing on the National Register. Since these aspects of the unit would be impacted, presenting an

unavoidable conflict with the parks mission and planned uses, applications for WTF would not be granted in this Rock Creek Park unit.

- Montrose Park (site uses determined by the Cultural Landscape Report: Montrose Park): Montrose park is listed on the National Register; therefore siting WTF within Montrose Park would be contrary to *NPS Management Policies 2006*, which calls for the protection of cultural resources, and the NHPA. Uses in this Rock Creek Park unit are guided by the Montrose Park Cultural Landscape Report (NPS 2004). This report calls for the preservation and maintenance of all existing historic features, reestablishment of several missing historic elements, retention of some existing non-historic features, and removing the non-original second tennis court. A series of actions are suggested that would improve and maintain this historic site. This park area is relatively small compared to the main unit of Rock Creek Park (324 acres compared to 1,822 acres), and any type of non-contributing structure, such as a WTF, would be expected to have a greater impact to the cultural resources at Montrose Park, even when concealed. Montrose Park is a National Register listed site with a document that guides the future land uses of the park unit. These land uses call for the restoration of historic features, and consideration of WTF in this unit would be considered an unavoidable conflict with the park's mission and planned land uses of this site.
- Applicants would be required to conform to the physical requirements for WTF facilities, such as height and lighting, directed by applicable authorities, as well as Federal Communication Commission regulations regarding radiofrequency emissions.

Alternative A: No-Action Alternative

Under the no-action alternative, right-of-way permit applications for WTF within any unit of Rock Creek Park would continue to be evaluated by the NPS in accordance with applicable authorities and RM-53. Requests for WTF siting in all areas of the park would be reviewed in the context of the park's GMP to determine if WTF siting would be acceptable in the requested area of the park. The park would continue to consider WTF applications without a more structured process or plan for the evaluation of such requests than is currently in place.

Alternative B: Zone Management

Under alternative B, the park would review and evaluate applications for WTF following RM-53, as described under the no-action alternative. Alternative B would add additional considerations to the process by identifying zones or areas of the park where WTF would be considered an appropriate use. In areas where a WTF may be considered appropriate, applications for a right-of-way permit to construct and operate a WTF could be sited and would be subject to certain permit terms and conditions specific to the area or zone proposed for the facility. Consideration of WTF and permit terms and conditions would be based on the GMP or the individual management document for each park unit and would include elements such as the design and location requirements for a proposed facility.

Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Under alternative C, the park would focus their efforts on coverage gaps in the park, while providing for protection of sensitive resources. This alternative would identify areas where coverage gaps for wireless telecommunication service exist (where gap is defined as no coverage or coverage below an "in-car" level), and encourage applicants to site in this area provided no conflicts with the park mission and

resources exist. In these areas where known coverage gaps exist, specific permit terms and conditions would be included to ensure protection of sensitive resources. These areas are located mainly along Beach Drive in the main unit of Rock Creek Park. Applications would be evaluated for other areas of the park using the permit terms and conditions detailed in alternative B for each zone or park unit.

Other alternatives considered but not analyzed further are described in “Chapter 2: Alternatives.”

IDENTIFICATION OF THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The NPS has identified alternative C as the “environmentally preferred alternative” in this EA because it best meets the definition established by the U.S. Council on Environmental Quality. Simply put, “this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves and enhances historic, cultural, and natural resources” (NPS 2004d, 2004e). There is no requirement that the environmentally preferred alternative and the preferred alternative be the same.

ENVIRONMENTAL CONSEQUENCES

The three alternatives were assessed in accordance with NPS Director’s Order 12, Conservation Planning, Environmental Impact Analysis and Decision-Making. The Director’s Order 12 Handbook requires that impacts to park resources be analyzed in terms of their context, duration, and intensity. It is crucial for the public and decision-makers to understand the implications of those impacts in the short and long term, cumulatively, and within context, based on an understanding and interpretation by resource professionals and specialists.

To determine impacts, methodologies were identified to assess the impacts that would occur with the implementation of the three alternatives. Thresholds for adverse impacts were established for each impact topic to help understand the severity and magnitude of changes in resource conditions.

Each action alternative (alternative B and alternative C) was compared to a baseline to determine the context, duration, and intensity of resource impacts. The baseline, for purposes of impact analysis, is the continuation of current management, or the no-action alternative (alternative A). The table below summarizes the results of the impact analysis for the impact topics that were assessed in “Chapter 4: Environmental Consequences.”

No park resources or values would be impaired by implementing any of the alternatives being considered and no unacceptable impacts would occur.

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Flora and Fauna	Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term minor adverse impacts to flora or fauna are expected in alternative A as a result of habitat disturbance and loss during the construction, operation, and maintenance of potential future WTF throughout the park. Long-term negligible adverse impacts would be expected for co-located facilities on existing sites. Long-term moderate adverse cumulative effects would be expected for alternative A. Impairment to flora and fauna would not occur.	Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term minor adverse impacts are expected from ground and noise disturbance during construction, operation, and maintenance of WTF; however, impacts are expected to be less than those described in alternative A, as zone/area specific permit terms and conditions would require certain types of technologies that would promote less disturbance of habitat. Long-term minor adverse cumulative impacts would occur for alternative B. Impairment to flora and fauna would not occur.	Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term negligible adverse impacts are expected from construction, operation, and maintenance of WTF as siting would be encouraged in areas of the park with coverage gaps, and specific terms and conditions would be applied to applications in these areas. For siting requests in areas that do not have coverage gaps, these applications would be evaluated by zone as described in alternative B, with long-term, minor, adverse impacts for facilities sited in these areas. Long-term negligible adverse cumulative impacts would occur for alternative C. Impairment to flora and fauna would not occur.
Sensitive Species	Long-term beneficial impacts to sensitive species are expected from prohibiting facilities in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas. Short- and long-term negligible to minor adverse impacts to sensitive species are expected as a result of implementing alternative A. However, it is likely that only negligible impacts would occur as all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to WTF, which would limit any	Impacts for alternative B would be the same as those in alternative A.	Long-term beneficial impacts to sensitive species are expected from prohibiting facilities in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas and from encouraging future sitings in areas with known coverage gaps. Long-term negligible adverse impacts would occur from encouraging siting in this one area and the associated permit terms and conditions for WTF. Further, all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to

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Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
	direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse impacts are expected for co-located facilities on existing WTF, as no sensitive species habitat is present around these WTF. Long-term negligible adverse cumulative effects would occur for alternative A. Impairment to sensitive species would not occur.		WTF, which would limit any direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse cumulative impacts would occur for alternative C. Impairment to sensitive species would not occur.
Avian Species	In the no-action alternative there would be long-term beneficial impacts from not siting WTF in the main areas of avian habitat, prohibitions on fencing, and the potential for co-location on existing WTF, which all reduce the potential for habitat fragmentation. Long-term minor to moderate adverse impacts to avian species could occur from habitat loss and increased collision risk, depending on the number of WTF sited in the park. A lack of a clear height restriction, outside the USFWS guidelines, for future WTF for alternative A would result in long-term moderate adverse impacts. During construction of new WTF, short-term minor adverse impacts would be expected to occur from the temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of	In alternative B there would be long-term beneficial impacts from not siting WTF in main areas of avian habitat, prohibitions on fencing, additional design requirements that could result in shorter facilities, and the potential for co-location on existing facilities as these actions reduce the potential for habitat fragmentation. Long-term negligible to minor adverse impacts would occur in those areas of the park where WTF would be granted due to the potential for habitat loss and bird collisions with WTF facilities. During construction of new WTF, short-term minor adverse impacts would be expected to occur from the temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, minor to moderate, and	In alternative C there would be long-term beneficial impacts from not siting WTF in main areas of avian habitat, encouraging siting in a specific area of the park where coverage gaps exist, prohibitions on fencing, specific design requirements that would result in shorter facilities, restriction on disturbance in the Forest Zone, and the potential for co-location on existing facilities as these actions reduce the potential for habitat fragmentation. Long-term negligible adverse impacts would occur in those areas of the park where WTF would be granted due to the potential for habitat loss and bird collisions with WTF facilities in these areas that are not considered the main areas of habitat for avian species. During construction of new WTF, short-term negligible to minor adverse impacts would be expected to occur from temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse.

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
	future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, minor to moderate, and adverse. In the no-action alternative, impairment to avian species would not occur.	adverse. In alternative B, impairment to avian species would not occur.	However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, negligible to moderate, and adverse. In alternative C, impairment or impacts to avian species would not occur.
Air Quality	Alternative A would have short-term minor adverse impacts to air quality during construction of new WTF, with long-term negligible adverse impacts during operation of the facilities. The construction, operation, and maintenance of potential future WTF is not expected to have a regional impact and would be in accordance with all provisions set forth in the SIP. Cumulative impacts for alternative A would be long-term minor adverse. Impairment to air resources and quality would not occur.	Impacts for alternative B would be the same as in alternative A.	Impacts for alternative C would be the same as in alternative A.
Soundscapes	Due to the potentially sensitive nature of some areas of the park, long-term adverse impacts to soundscapes from alternative A would range from minor to moderate, based on the location of the facility. During construction, short-term minor to moderate adverse impacts would be expected due to the use of heavy equipment. Cumulative impacts for alternative A would long-term moderate adverse. Impairment to park soundscapes would not occur.	Due to the potentially sensitive nature of some areas of the park, short- and long-term adverse impacts to soundscapes from alternative B would range from minor to moderate, based on the location of the facility. The requirement for certain types of technologies in certain zones and areas of the park would result in these impacts mainly being minor. Cumulative impacts for alternative B would long-term minor to moderate adverse. Impairment to park soundscapes would not occur.	Applicants for WTF would be encouraged to site in areas with coverage gaps, which have levels of high ambient noise, resulting in short-term minor adverse and long-term negligible adverse impacts. In those areas of the park where there are no coverage gaps, there would be short- and long-term minor to moderate impacts, depending on how sensitive the resources in the zone or area are to noise. Cumulative impacts for alternative C would be long-term negligible adverse. Impairment to park soundscapes would not occur.

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Historic Resources	<p>The potential siting of new WTF within historic resources listed or eligible for the National Register under the proposed application process described in alternative A would have minor long-term adverse impacts (no adverse effect under NHPA Section 106) on historic resources as the park's management documents would prevent WTF from siting in areas with sensitive cultural resources. Cumulative impacts would be long-term minor and adverse (no adverse effect under NHPA Section 106). Impairment to historic resources would not occur for alternative A.</p>	<p>The potential siting of new WTF within historic resources listed or eligible for the National Register under the proposed application process outlined in alternative B would have long-term minor adverse impacts (no adverse effect under NHPA Section 106) on historic resources, with the set permit terms and conditions providing beneficial impacts. Cumulative impacts would also be long-term minor and adverse (no adverse effect under NHPA Section 106). Impairment to historic resources would not occur for alternative B.</p>	<p>Installation of one or more WTF along Beach Drive or in other areas of Rock Creek Park subject to specific permit terms and conditions that would utilize the newest and disguised technology and conditions regarding size and height of the facilities would have negligible to minor long-term adverse impacts (no adverse effect under NHPA Section 106) on the Rock Creek Park Historic District for alternative C depending on the number of WTF established in any one area. Cumulative impacts from the combination of these impacts with those from past, present, and future actions would remain negligible to minor long-term adverse impacts (no adverse effect under NHPA Section 106). Impairment to historic resources would not occur for alternative C.</p>
Cultural Landscapes	<p>Potential siting of new WTF within cultural landscapes listed or eligible for the National Register under the proposed application process outlined in alternative A would have long-term minor adverse impacts (no adverse effect under NHPA Section 106) on the park's cultural landscapes. Cumulative impacts would also be long-term, minor, and adverse (no adverse effect under NHPA Section 106). Impairment to cultural landscapes would not occur for alternative A.</p>	<p>The potential siting of new WTF within cultural landscapes listed or eligible for the National Register under the proposed application process outlined in alternative B would have long-term minor adverse impacts (no adverse effect under NHPA Section 106) on the park's cultural landscapes, with the established permit terms and conditions in each zone lessening these impacts. Cumulative impacts would also be long-term, minor, and adverse (no adverse effect under NHPA Section 106). Impairment to cultural landscapes would not occur for alternative B.</p>	<p>Siting one or more WTF along Beach Drive, where siting would be encouraged, or in other existing coverage gap areas would be subject to specific permit terms and conditions that would utilize the newest and disguised technology, as well as permit conditions regarding size and height of the facilities, would have long-term negligible to minor adverse impacts (no adverse effect under NHPA Section 106) on the park's cultural landscapes for alternative C. The permit terms and conditions specific to areas with coverage gaps would provide further protection for cultural landscapes in those areas.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
			Cumulative impacts from the combination of these impacts with those from past, present, and future actions would remain long-term negligible to minor adverse impacts (no adverse effect under NHPA Section 106). Impairment to cultural landscapes would not occur for alternative C.
Archeological Resources	In alternative A, limiting the placement of WTF pursuant to the applicable authorities would result in long-term negligible impact on archeological resources of the park as the resources in the zones and areas would be protected. In areas where WTF would be sited, applicants would be required to comply with NEPA and NHPA Section 106, which would include testing to identify and evaluate the eligibility of potential site pursuant to Section 106. Due to the excavations associated with the identification and evaluation of potential National Register-eligible archeological sites within proposed new WTF sites, including antenna support structures, alternative A would potentially have long-term minor to moderate impacts (no adverse effect under NHPA Section 106) on archeological resources. Cumulative impacts would be long-term minor to moderate adverse (no adverse effect under NHPA Section 106). Impairment to archeological resources would not occur for alternative A.	Management zones or areas that provide specific permit terms and conditions would result in long-term negligible impact on archeological resources of the park as the resources in the zones and areas would be protected, with minor to moderate adverse impacts occurring from necessary excavations. Alternative B would potentially have long-term minor to moderate adverse impacts (no adverse effect under NHPA Section 106) to archeological resources due to these ground disturbances. Cumulative impacts would also be long-term minor to moderate adverse (no adverse effect). Impairment to archaeological resources would not occur for alternative B.	Impacts to the archeological resources in the units of Rock Creek Park resulting from alternative C would be long-term and range from negligible to moderate adverse impacts (no adverse effect under NHPA Section 106). Cumulative impacts would also be long-term and range from negligible to moderate (no adverse effect under Section 106). Impairment to archaeological resources would not occur for alternative C.

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Visitor Use and Experience	In the no-action alternative, there would be long-term negligible to moderate adverse impacts as various user groups are impacted differently from the noise, visual, and physical presence of WTF in various units of Rock Creek Park. In general, those visitors seeking solitude would be impacted moderately, while those who are engaging in activities such as commuting or pleasure driving would be impacted negligibly. Cumulative impacts for the no-action alternative would be long-term, minor, and adverse.	In alternative B, impacts to visitor use and experience would mainly be long-term minor adverse as WTF would be subject to specific permit terms and conditions that would likely result in WTF that are less intrusive on the visitor experience. These impacts would increase to long-term moderate adverse in low intensity visitor use areas where WTF would be more intrusive on the visitor experience.	In alternative C, encouraging applicants to site WTF where coverage gaps exist along Beach Drive would be expected to have long-term negligible impact to visitor use and experience as this area hosts mostly high intensity visitor uses including commuting and pleasure driving. These types of uses would not be expected to be impacted as much by the visual presence or the noise associated with WTF a more passive uses, such as hiking. These uses may also benefit from having cellular coverage. In all other units of Rock Creek Park, impacts would mainly be long-term minor adverse in higher intensity use areas as WTF would be subject to specific permit terms and conditions that would likely result in WTF that are less intrusive on the visitor experience. These impacts would increase to long-term moderate adverse in low intensity visitor use areas where WTF would be more intrusive on the visitor experience. Cumulative impacts for alternative C would be long-term, negligible, and adverse.
Socioeconomic Resources	In the no-action alternative, impacts to property values, including home values in the areas surrounding the park, would be long-term negligible adverse, with long-term beneficial impacts to public finance. Long-term negligible beneficial cumulative impacts would occur.	In alternative B, impacts to property values, including home values in the areas surrounding the park, would be long-term negligible adverse with potential long-term negligible impacts occurring from the requirement for concealed facilities and equipment buildings. Long-term beneficial impacts to public finance would also be expected. Cumulative impacts	In alternative C, impacts to property values, including home values in the areas surrounding the park, would be long-term negligible adverse. In areas with coverage gaps where facility siting would be encouraged, there would be potential long-term beneficial impacts occurring from the requirement for concealed facilities and equipment buildings, and the

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
		would be long-term and beneficial.	potential for concentration of WTF in areas that are not surrounded by residential properties. Long-term beneficial impacts to public finance would also be expected. Cumulative impacts would be long-term and beneficial.
Human Health and Safety	Impacts would be long-term beneficial from increased coverage and the ability to reach emergency services, and long-term negligible adverse from any change in the number of accidents related to cellular phone use while driving. There would no impacts from radiofrequency emissions as any new WTF would be required to comply with FCC regulations. Cumulative impacts for the no-action alternative would be long-term and beneficial.	Impacts for alternative B would be the same as those in alternative A.	Impacts for alternative C would be the same as those in alternative A.
Park Management and Operations	The lack of pre-determined areas and associated permit terms and conditions for WTF would result in longer application process and have long-term minor adverse impacts. Cumulative impacts to park operations and management for the no-action alternative would be long-term minor to moderate adverse.	Because a more formalized process would be created with set areas for consideration, as well as potential permit terms and conditions, the application process for WTF would be more efficient, resulting in long-term beneficial impacts. Cumulative impacts would be long-term, negligible, and adverse.	Because a more formalized process would be created with set areas for consideration, as well as potential permit terms and conditions, the application process for WTF would be more efficient, resulting in long-term beneficial impacts. Cumulative impacts would be long-term, negligible, and adverse.

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APPENDIXES

- A: Annual Report: The Effects of Cell Towers on Birds and Bats at Rock Creek Park, Washington D.C.
- B: Evaluation of Coverage and Alternate Sites for the Two Verizon Wireless Towers located in Rock Creek Park
- C: Avian Species Identified During Breeding Bird Surveys as Potential Breeding Species
- D Air Quality Applicability Analysis

PURPOSE OF AND NEED FOR ACTION

INTRODUCTION

This chapter describes why the National Park Service (NPS) is taking action at this time to evaluate a range of alternatives and management actions for wireless telecommunication facilities (WTF) at Rock Creek Park. This WTF Plan / Environmental Assessment (plan/EA) presents two action alternatives for managing the evaluation of right-of-way permit applications for siting WTF within the park and assesses the impacts that could result from continuing current management (the no-action alternative) or implementing either action alternative. Upon conclusion of this WTF plan/EA and decision-making process, one of the three alternatives will become the WTF plan and guide future actions for management of WTF in the park. The scope of this plan is limited to addressing WTF related to the provision of wireless telecommunications services, such as cellular phones. This plan is narrowly tailored to respond to the legal authorities governing placement of WTF on parkland, which contain significant differences from those authorities applicable to other technologies, such as WiFi, radio, and television, which are not addressed in this plan.

PURPOSE OF AND NEED FOR ACTION

The “Purpose of the Plan” explains what the WTF plan/EA intends to accomplish. The “Need for Action” outlines why action is necessary at this time.

Purpose of the Plan

The purpose of taking action at this time is to provide all administered units of Rock Creek Park with a consistent framework for protecting park resources during the consideration of “right-of-way permit” applications and other inquiries submitted to the park for the construction, operation, and maintenance of WTF. Such a framework is needed because government agencies, including the NPS, are required to consider applications for siting WTF on their lands.

Need for Action

A WTF plan/EA is needed to:

- Meet the conditions of the *2003 Rock Creek Park Telecommunication Facilities EA Finding of No Significant Impact (FONSI)*, which states the NPS will develop and adopt a telecommunication facilities plan to assist the park in future decision-making regarding potential WTF permit applications.
- Provide a consistent and coordinated process for considering right-of-way permit applications for WTF use throughout Rock Creek Park administered units and assist the park with the protection of natural and cultural resources, human health, visitor safety, and visitor experience.
- Satisfy the National Capital Planning Commission (NCPC) requirement that a plan for evaluating right-of-way applications for WTF in Rock Creek Park be in place before the NCPC considers any renewals of the existing WTF in the park.

OBJECTIVES IN TAKING ACTION

Objectives were developed for the WTF plan/EA for all units of Rock Creek Park in accordance with NPS Directors Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001). Under Directors Order #12, an objective is a statement of goals to meet the purpose and need

for action. The objectives of a plan must be achieved to a large degree for the action to be considered a success (NPS 2001). All action alternatives selected for detailed analysis must meet project objectives to a large degree, and resolve the purpose of and need for action. Objectives must be grounded in the park's enabling legislation, purpose, significance, and mission goals, and must be compatible with direction and guidance provided in the park's general management plans, strategic plan, and/or other management guidance. The objectives for the WTF plan/EA are provided below.

Management Methodology

- Provide the foundation for decision-making regarding the issuance of right-of-way permits for the provision of WTF within Rock Creek Park administered units.
- Establish criteria for determining where WTF would or would not be appropriate in Rock Creek Park.
- Provide guidance on how the park can meet the requirements set out in the Telecommunications Act of 1996, the 1995 Presidential Memorandum, and government-wide procedures, and relevant NPS laws, regulations, and policies as they relate to the processing of applications and the authorization of citing, installation, operation, and maintenance of WTF.
- Determine management measures for the installation, operation, and maintenance of WTF that can be implemented to protect the park's cultural and natural resources.
- Serve and maintain the management prescriptions and goals outlined in the Rock Creek Park and the Rock Creek and Potomac Parkway General Management Plan (GMP) and Record of Decision (ROD) as they relate to the installation, operation, and maintenance of WTF. This plan states that only telecommunication structures that do not jeopardize the park's mission and resources may be permitted within the park.

Wildlife and Wildlife Habitat

- Incorporate best available research related to the construction, operation, and maintenance of WTF and the effect on wildlife and wildlife habitat, specifically migratory birds.
- Specify wildlife and wildlife habitat resource conditions to be protected and maintained at all Rock Creek Park administered units as related to the installation, operation, and maintenance of WTF.

Cultural Resources

- Specify cultural resource conditions to be protected and maintained at all Rock Creek Park administered units as related to the installation, operation, and maintenance of WTF.
- Protect those features contributing to the historic designed landscape of all Rock Creek Park administered units.

Health and Safety

- Ensure public safety within the park.
- Protect the health and safety of park employees and visitors from exposure to radiofrequency emissions from WTF.

Land Use

- Communicate and coordinate with adjacent property owners, existing land use plans and policies affecting the area, federal commissions such as the NCPC and the Commission of Fine Arts (CFA), and other local entities and authorities during the development and implementation of a WTF plan/EA.

PROJECT SITE LOCATION

As an administrative unit of the national park system, Rock Creek Park is composed of 99 areas known as reservations, or units, located in Washington, D.C. (see figure 1). The largest of the 99 reservations, Reservation 339, was established by Congress on September 27, 1890, and consists of 1,754 acres that include Rock Creek and the surrounding valley from the Maryland state line south to the National Zoo. Beyond Reservation 339, Rock Creek Park administers areas such as the Rock Creek and Potomac Parkway (Reservation 360), Glover-Archbold Park (Reservation 351 and 450), Fort Reno (Reservation 470 and 515), Fort Totten (Reservation 544), and Meridian Hill Park (Reservation 327).

The focus of the WTF plan/EA is to develop strategies for the decision-making process for siting WTF in and around the 99 units administered by Rock Creek Park in Washington, D.C. Units included in this study are shown in table 1.

TABLE 1: ROCK CREEK PARK NAMED ADMINISTERED UNITS

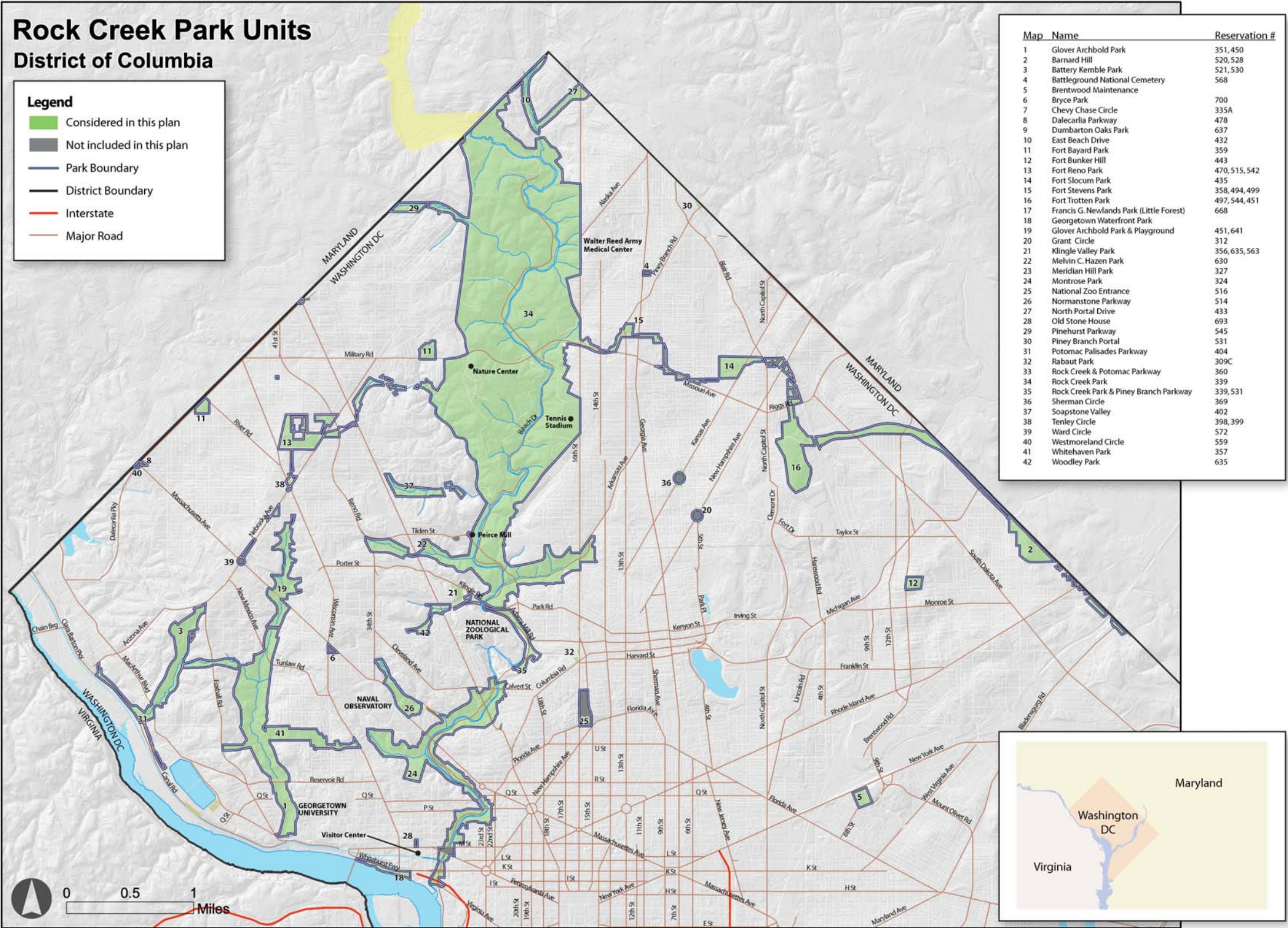
Unit Name	Reservation Number	Approx. Acreage	Enabling Legislation
Rock Creek Park and tributary park extensions	339		
Pinehurst Parkway	339, 545		
Melvin Hazen Park	630		
Klingle Valley	356, 635, 563	1,822	26 Stat 492 September 27, 1890
Soapstone Valley Park	402		
Normanstone Parkway	514		
North Portal Parkway	433		
Beach Parkway	432		
Rock Creek and Potomac Parkway	360	171	Public Buildings Act of March 4, 1913
Fort Circle Parks			
Fort Reno	470, 515, 542	62	
Fort Stevens	358, 494, 499	24	
Battery Kemble	521, 530	57	
Fort Bayard	359	4	Capper-Cramton Act, May 29, 1930
Fort Slocum	435	18	
Fort Totten	497, 544, 451	129	
Fort Bunker Hill	443	6	
Fort DeRussy			
Barnard Hill	520, 528	29	Capper-Cramton Act, May 29, 1930
Dumbarton Oaks Park	637	27	Deeded to government from private donors
Meridian Hill Park	327	12	36 Stat 1310 March 4, 1911
Montrose Park	324	16	1911 District appropriations act provision (36 Stat 1005), transfer from District of Columbia or other
Glover-Archbold Park, Glover Parkway & Children's Playground	351 (A-K), 450 (A-B), 451, 641	287	Land donations, authorized June 6, 1924 (43 Stat 464) and February 25, 1925 (43 Stat 978)

PURPOSE OF AND NEED FOR ACTION

Unit Name	Reservation Number	Approx. Acreage	Enabling Legislation
Triangle Parks (irregular parcels) [not shown on figure 1]	302, 303, 303B, 309 (A-B, G), 312 (A, I), 313B, 330 (B-C), 345, 346, 397, 448, 436, 438, 447, 468, 565, 573, 587, 614, 643, 667, 686	5.07	Transfer from District of Columbia or other
Traffic Circles Grant Circle Chevy Chase Circle Sherman Circle Tenley Circle Westmoreland Circle Ward Circle	303A 312 335A 369 398, 399 559 572	0.16 1.84 0.71 2.32 0.16 0.76 0.69	Transfer from District of Columbia or other
Curb Parking – Ashmeade PI between Connecticut Ave & Kalorama Rd NW, Jenifer & 41 st Sts at Belt Rd NW, Western Ave & Patterson St NW	303D, 326C, 335, 361	0.44	Transfer from District of Columbia or other
Center Parking – Tilden St & Linnean Ave NW, Rock Creek Dr between Edgevale Terr & Normanstone Dr NW	308A, 338	1.20	Transfer from District of Columbia or other
Rabaut Park	309C	0.57	Transfer from District of Columbia or other
Whitehaven Parkway	357	51.25	--
Reservoir Playground	469 (combine with 404)	0.00	NA
National Zoological Park Entrance – Harvard St NW	516	1.0	Capper-Cramton Act, May 29, 1930
Park – Garfield St, between Fulton St & Foxhall Rd NW	529	14.0	Capper-Cramton Act, May 29, 1930
Piney Branch Portal	531	0.77	Transfer from District of Columbia or other
Park – north side of National Zoological Park & Adams Mill Rd NW	563	1.77	Transfer from District of Columbia or other U.S. agency
Battleground National Cemetery	568	1	Transfer from U.S. agencies
Melvin C. Hazen Park	630	43	Capper-Cramton Act, May 29, 1930
Woodley Park	635	3	Capper-Cramton Act, May 29, 1930 and transfer from District of Columbia or other
Francis G. Newlands Park (Little Forest)	668	9	Dedication/donation from private party
Park – Pennsylvania Ave btw 28 th & M Sts NW	691	0.07	Transfer from District of Columbia or other
Old Stone House	693	0.42	Purchased by Department of the Interior, NPS, or NCR, legislation approved September 25, 1950
Bryce Park	700	0.58	Capper-Cramton Act, May 29, 1930

Parklands not covered by specific legislation were established under the general authority of the National Capital Park Commission, approved June 6, 1924 (43 Stat 463). Source: NPS 2002b.

FIGURE 1: VICINITY MAP



BACKGROUND

The *Telecommunications Act of 1996* was enacted “to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies” [Public Law No. 104-104, 110 Stat. 56 (1996)]. The *Telecommunications Act of 1996* addresses, among many other important subjects, some of the technical problems that have arisen from the increasing popularity of mobile communications. President Clinton’s preceding memorandum of August 10, 1995, entitled “Facilitating Access to Federal Property for the Siting of Mobile Services,” directs federal agencies to develop procedures necessary to facilitate access to federal property for the siting of mobile services antennas. Section 704(c) of the *Telecommunications Act of 1996* and its regulations, and the GSA Bulletin 2007-B2 Placement of Commercial Antennas on Federal Property (which replaced D-246) make federal property, including parkland, available for placement of telecommunications equipment by duly authorized providers absent unavoidable conflicts with the department or agency’s mission, or the current or planned use of the property, or access to that property. The specific NPS guidance and procedures are contained in Director’s Order #53: Special Park Uses and its accompanying reference manual, NPS Reference Manual 53 (RM-53). The NPS general authority to issue right-of-way permits for power and communications facilities is in 16 USC § 5, with the regulations at 36 Code of Federal Regulations (CFR) Part 14.

With the number of wireless telecommunication devices in the U.S. on the rise, there is an increasing demand for more infrastructure to support this service. The increasing demand for service can be seen by the estimated number of wireless subscribers growing from 44,042,992 in 1996, to 233,040,781 ten years later in 2006 (CTIA 2006). Rock Creek Park currently has two WTF located within its boundary that, in part, contributed to the need for this WTF plan/EA.

SUMMARY OF WIRELESS TELECOMMUNICATION FACILITIES

Telecommunications is the transmission, emission or reception of radio signals, digital images, sound bytes or other information via wires, cables, and space, through radio frequencies, satellites, microwaves, or other electromagnetic systems. Telecommunications includes the transmission of voice, video, data, and broadband using wireless or satellite technologies. Although telecommunications encompasses all of these aspects, the scope of this plan will address telecommunications related to WTF for wireless telephone service. Wireless telecommunications, also known as wireless telephony, includes mobile phones, pagers, and two-way enhanced radio systems, and relies on the combination of land lines, fiber, and an extensive network of elevated antennas, typically found on communication towers, to transmit voice and data information. This technology is known as the first and second generation (1G and 2G) of wireless deployment (CityScape Consultants, Inc., S. Rabold, pers. comm., April 2, 2004).

The first generation of wireless telecommunications, known as 1G, operated on an analog system in the 800 megahertz (MHz) range. This technology only carries one conversation per channel, limiting the number of users. Wireless telecommunications continued operating with 1G technology through the 1980s, when digital technology appeared and led to second generation, or 2G, wireless technology. The 2G technology used digital circuit switching that allowed multiple conversations on the same channel and greatly increased capacity (Silicon Press 2007).

Currently in the United States, wireless telecommunications are using 3G technology. This technology allows both universal access and portability across different device types with a faster communications speed than the 2G systems (Silicon Press 2007). Third, fourth, and fifth generations (3G, 4G, and 5G) of wireless telecommunications include the ability to provide instant access to e-mail, the internet, radio, videos, TV, pod-casting, mobile commerce, and Global Positioning System (GPS), in one hand-held,

palm pilot type wireless telephone unit. Successful use of this technology requires the deployment of a significant amount of additional infrastructure, i.e., elevated antennas on above ground structures such as towers, bridges, water tanks, roof-tops, signage, electrical transmission towers, and light poles.

Types of Wireless Telecommunication Facilities

WTF can vary greatly, depending on the type of technology used, and this technology is rapidly evolving. Fixed facilities used for wireless telecommunications are referred to as cellular base stations, cell stations, PCS (“Personal Communications Service”) stations or telephone transmission towers. These base stations consist of antennas and electronic equipment. Because the antennas need to be high in the air, they are often located on towers, poles, water tanks, rooftops, or other support structures. Typical heights for freestanding base stations can be anywhere between 50 and 200 feet (FDA 2003).

A WTF consists of four parts: the support structure, the equipment building, the antennas, and the utilities. Most support structures are made of aluminum, steel, stainless steel, wood, plastic or composite materials. Carbon and alloy steels offer high toughness; however, steel structures need to be painted or coated to prevent rust or corrosion. Stainless steel is highly corrosion resistant, but often too expensive for use in large support structures. Plastic products and fiber reinforced polymers (FRP) provide alternatives to metal materials (GlobalSpec 2007). There are four main types of facilities, which include mainly tower structures:

1. Lattice Tower – A lattice tower is typically three-sided with a triangular base and is often used in heavy loading conditions.
2. Monopole Tower – This is a tower that is a single pole. The heights of these structures generally do not exceed 200 feet. Antennas are mounted on the exterior of the tower.
3. Guyed Tower – These facilities are supported by guy wires anchored into the ground. Most radio and television towers are guyed towers. These structures can reach more than 300 feet in height.
4. Stealth Tower or Other Type of Facility – These facilities are poles, towers, or other structures that are designed to look like something else such as a tree or a sign. Many municipalities require these types of towers in their zoning regulations. They are generally more expensive than the other types of towers to install because of added materials needed to disguise the appearance of the facility, also known as a “stealth” facility.

While the above types of facilities represent the range available to the wireless industry, the types of structures permitted on NPS lands are limited by applicable authorities. For example, the U.S. Fish and Wildlife Service (USFWS) guidelines for siting WTF precludes the use of guyed towers and the NPS *Management Policies 2006* directs parks to give preference to co-location or camouflaged facilities before approval of monopole or lattice structures. In addition to free standing support structures, antennas can also be placed on existing structures such as rooftops and signs.

The above support structures (or base stations) are used to house an antenna. An antenna is a structure or device that is used to radiate or receive electromagnetic waves. Generally a support structure will house multiple antennas from each carrier. There can be as few as three or as many as 18 antennas per carrier on a tower. In urban and suburban areas, wireless providers commonly use panel or sector antennas for their base stations. These antennas consist of rectangular panels, about 1 foot wide by 4 feet tall. The antennas are usually arranged in three groups of three antennas each. One antenna in each group is used to transmit signals to wireless phones, and the other two antennas in each group are used to receive signals from wireless phones (FDA 2003).

FIGURE 2: EXISTING SUPPORT STRUCTURE AND ANTENNA AT THE ROCK CREEK PARK TENNIS CENTER



Figure 2 shows the existing WTF at the Rock Creek Park tennis center, which is a monopole with circular “can” shaped antenna at the top. Figure 3 shows the large range of forms that WTF support structures and antenna can take, including examples of “stealth” or concealed facilities.

WTF include operating equipment, which is often called the Base Transmitter Station or BTS, or an equipment shelter. The electronic equipment associated with these facilities can be housed in either an equipment room within a pre-existing building, in a specially constructed outdoor equipment shelter, and/or in specialty cabinets designed by cellular providers or equipment vendors. Equipment cabinets range in size and capacity from one small cabinet that can be the size of a 2-foot by 2-foot square to the size of a refrigerator. Multiple cabinets may be required if a company decides to expand the capacity of a site, or there may be multiple cabinets associated with one structure that houses multiple providers’ antennas (Harvard 1997). Equipment cabinets may be concealed so as not to diminish the aesthetics of the landscape.

Equipment shelters for a WTF typically include (Harvard 1997) the following:

- environmental control (air conditioning and heating units)
- electrical power supply (DC battery packs and /or AC power and/or a power generator)
- a connection to local telephone lines (either a T-1 or E-1 line, similar to a regular phone line, or a microwave antenna placed near the main antennas)
- back-up power supply
- radio transceivers
- data interface which mediates between the telephone company and radios
- noise filters

- coaxial cables connecting the antennas to the equipment room/cabinet.

Figure 4 shows the existing equipment building for the WTF at the Rock Creek Park tennis center. Figure 5 illustrates other types of equipment cabinets that would need to be housed in a weather proof building if located outdoors.

FIGURE 3: ANTENNA AND SUPPORT STRUCTURE EXAMPLES



FIGURE 4: EXISTING EQUIPMENT SHELTER AT THE ROCK CREEK PARK TENNIS CENTER



FIGURE 5: TYPICAL EQUIPMENT CABINETS FOUND INSIDE EQUIPMENT SHELTERS



Source: Harvard 1997

SUMMARY OF WIRELESS TELECOMMUNICATION FACILITIES IN ROCK CREEK PARK

Utility services and infrastructure have long been located in NPS units, either to provide service within parks or because geographic or other considerations necessitate the use of park lands to provide service to users outside a park. Title 16, United States Code, Section 5, Section 79 and other authorities authorize the NPS to issue right-of-way permits subject to all terms and conditions necessary to protect park resources and values. At least 35 national parks have wireless telecommunication equipment (including cellular, radio, microwave, and television support facilities) installed within their boundaries, some with more than one site (L. Dickinson, NPS, pers. comm., L. Gillham, NPS, Mar. 16, 2007).

In some parks equipment has been installed on existing towers, buildings, and structures. These include not only Rock Creek Park but facilities in other National Capital Region parks such as administered units of George Washington Memorial Parkway, Catoctin Mountain Park, and Wolf Trap National Park for the Performing Arts. Other parks across the country with WTF include Big Cypress National Preserve, Yellowstone National Park, and Golden Gate National Recreation Area. NPS policy and guidance on issuing right-of-way permits is found in the applicable authorities including *NPS Management Policies 2006*, Director's Order #53 and RM-53, Special Park Uses, USFWS Guidelines on Siting Telecommunication Facilities, and 36 CFR Part 14. These NPS reference documents provide detailed instructions to NPS staff regarding how to process, approve, or deny applications for such right-of-way permits. The process includes not only the consideration of right-of-way applications, but also careful consideration of the *National Environmental Policy Act* (NEPA), *National Historic Preservation Act* (NHPA), and *Endangered Species Act* (ESA) compliance.

There are two WTF currently located in Rock Creek Park. On April 15, 1998, Bell Atlantic Mobile, Inc. (now Verizon Wireless) submitted separate applications to the NPS for right-of-way permits to construct, operate, and maintain two WTF within Rock Creek Park, Washington, D.C. The proposed facilities included a monopole, antennas, and supporting infrastructure to be constructed within the Rock Creek Park tennis center complex on the east side of the park and a monopole, antennas, and supporting infrastructure to be constructed within the park's maintenance yard on the west side. As a result of the permit application, pursuant to the *Telecommunications Act of 1996* and NEPA, an EA was prepared by the NPS, National Capital Region to analyze the potential impacts of the proposed facilities on the resources of Rock Creek Park (NPS 1999).

After completing the EA, the NPS initially concluded that the WTF would not have a significant impact on the quality of the human environment and, on March 2, 1999, the NPS issued this finding through a Finding of No Significant Impact (FONSI), which was revised on April 7, 1999. Following a series of meetings before the CFA and the NCPC, the NPS issued a right-of-way permit on November 8, 1999 to Bell Atlantic Mobile, Inc., authorizing the construction of the monopole-mounted wireless telecommunication antennas and supporting infrastructure at the Rock Creek Park tennis center and the park's maintenance yard. Bell Atlantic Mobile, Inc. placed the WTF at the tennis center and the maintenance yard into service on March 15 and 17, 2000. These WTF remain in operation today.

The Audubon Naturalist Society of the Central Atlantic States, along with private individuals, filed suit challenging the NPS decision to grant Bell Atlantic Mobile, Inc. the right-of-way permits. The plaintiffs claimed that the NPS violated NEPA by relying on a legally insufficient EA, which led the NPS to erroneously issue a FONSI and grant the permits. On July 2, 2002, the U.S. District Court for the District of Columbia found that the EA was insufficient in its analysis of impacts on migratory birds and viewsheds and required the NPS to complete a new EA for the facilities. As a result, the EA was revised and a revised FONSI was signed on June 16, 2003.

The 2003 FONSI allowed the WTF to remain in Rock Creek Park with additional mitigation applied to protect park resources and values. The preferred alternative allows for the continued operation and maintenance of the two WTF at the maintenance yard and the tennis center, respectively, as currently permitted, but requires the NPS to:

- Develop and adopt a WTF plan to assist the park in future decision-making regarding potential WTF permit applications. The planning process is to include public scoping and comment, analysis of a range of alternatives for future placement of facilities, and a decision document.
- Seek funds to develop and adopt a program to monitor the impact of the existing WTF on migratory birds. This monitoring program was developed in cooperation with the USFWS, other agencies, and interested parties, and is currently in the second year of a three-year study. Should the monitoring program disclose effects to migratory birds from the monopole towers or appurtenant structures, the NPS will coordinate with the U.S. Fish and Wildlife Service to determine the necessary steps to address the issue.

Presently, the two facilities permitted within Rock Creek Park (Reservation 339) include a 100-foot monopole-mounted wireless telecommunication antenna and supporting infrastructure at the Rock Creek Park tennis center and a 130-foot monopole and supporting infrastructure at the park's maintenance yard. The right-of-way permits for the existing WTF at Rock Creek Park were renewed in October 2005. During this renewal process, the NCPC approved the renewal of the two WTF, but stated that, among other things, a plan for future WTF siting in the park needed to be complete before the NCPC would consider another renewal. While there are no formal applications for WTF in the park pending for other providers, pre-application meetings with some providers have been held. Co-location at the existing facilities may be permitted under the right-of-way permit (RW 3450-99-003) for the two sites that states: "The permittee will allow any future wireless provider approved by the NPS to co-locate on the Permittee's antenna so long as such co-location does not interfere with the Permittee's existing use of the property." Any potential co-locator must get approval from the NPS. The NPS determines through the NEPA process if the co-location would result in unacceptable impacts to park resources.

SCOPING PROCESS AND PUBLIC PARTICIPATION

NEPA regulations require an "early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (Council on Environmental Quality [CEQ] NEPA Regulations Section 1501.7). To determine the scope of issues to be analyzed in depth in this WTF plan/EA, meetings were conducted with park staff and other parties associated with preparing this document, including public scoping meetings.

PUBLIC SCOPING MEETINGS

On April 24 and 25, 2007, two public scoping meetings were held to solicit public input, focusing on issues and potential alternative elements. Public participation is vital to the NPS NEPA planning process, and public scoping is an early and open process used to determine the scope of issues and alternatives to be addressed in this WTF plan/EA. Both meetings were held at the Rock Creek Park Nature Center in Washington, D.C. from 6:00 pm to 9:00 pm, and included an open house, presentation by the NPS, and an opportunity for public comment in a formal hearing style. A total of 11 people attended the two public scoping meetings.

To keep the public involved and informed following the public scoping meetings, individuals were given the option to receive notification of the availability of this document by either e-mail or mail, and

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the option to either download a copy or have a hardcopy mailed to them. Individuals were also given the option not to be placed on the mailing list, and an option to keep their name and address private.

The comment period on public scoping began on April 9, 2007, with the release of the public scoping brochure for this WTF plan/EA. The NPS provided the public with a 35-day opportunity to participate in public scoping through the mail or on-line on the Planning, Environment and Public Comment (PEPC) website, with a May 13, 2007, deadline for comments.

Though comments were varied, most comments focused on facility design, the use of existing cell towers by multiple providers, and the impacts of facility construction on avian wellbeing. Comments also focused on telecommunication coverage gaps and the need for greater public participation. The public was invited to submit comments on the scope of the planning process and potential alternatives. It was explained that comments received should focus on this WTF plan/EA, but may also be applicable to longer term use of the park.

In response to public input and issues expressed during the scoping process, the interdisciplinary planning team revised the conceptual alternatives presented at the meetings and developed those alternatives analyzed in this WTF plan/EA.

As a result of this scoping effort (see “Chapter 5: Consultation and Coordination” for additional information), several issues and impact topics were identified that require further analysis in this WTF plan/EA.

Issues and Impact Topics

Issues describe problems or concerns associated with current impacts from environmental conditions or current operations, as well as problems that may arise from the implementation of any of the alternatives. Park staff identified potential issues associated with this WTF plan/EA during internal scoping meetings, the public identified potential issues during public scoping, and state and federal agencies identified potential issues through correspondence.

Wildlife and Wildlife Habitats including Sensitive Species and Avian Species

Impacts from WTF construction, operation, and maintenance activities on flora and fauna – The construction, operation, and maintenance of WTF could disturb wildlife through disruption and loss of habitat for facility placement and access. Impacts could also occur to vegetation that provides habitat in the park through direct loss during siting and through compaction of soils that inhibits vegetation growth. These impacts could include forest fragmentation or the creation of new edge habitats that create new habitat for non-native and invasive plant species, which would impact local plant species.

Impacts from WTF construction, operation, and maintenance activities on migratory birds and other avian species – The construction, operation, and maintenance of WTF could impact migratory, resident, and neotropical bird species (including raptors) in the park. Facilities sited in a migratory flyway could increase the potential for bird collisions with the structures and create a diversion in migratory routes.

Impacts from WTF construction, operation, and maintenance activities on wildlife health due to radiofrequency exposure – The operation of WTF may have long-term health impacts on park wildlife due to radiofrequency emissions from the facilities.

Impacts from WTF construction, operation, and maintenance activities on locally sensitive wildlife – The construction, operation, and maintenance of WTF could impact locally sensitive wildlife by direct

removal during siting of the facility or impacts during operation of the facility, such as loss of habitat due to noise and disturbance.

Air Quality

Impacts from WTF construction, operation, and maintenance activities on regional air quality – Rock Creek Park is located in an area classified by the U.S. Environmental Protection Agency as moderate non-attainment for ozone. Pollutant emissions resulting from the construction, operation, and maintenance of WTF within the park could create increases in emissions that could impact local residents and park visitors.

Soundscapes

Impacts from WTF construction, operation, and maintenance activities on noise levels and soundscapes in the park – The construction, operation, and maintenance of WTF within the park could create noise emissions from vehicle traffic during construction and operation and the running of generators and cooling fans. These noise emissions could impact local residents, park visitors, wildlife, and wildlife habitats.

Cultural Resources

Impacts from WTF construction, operation, and maintenance activities on historic structures – The construction, operation, and maintenance of WTF could impact historic structures listed or eligible for listing on the National Register of Historic Places (NRHP or National Register) within the park. Many units of Rock Creek Park are listed on the NRHP as historic districts. The construction and operation of WTF could have an adverse effect on the historic qualities of these park units that make them eligible for listing on the National Register. These facilities could also affect the historical accuracy of a given site or structure by creating conditions that differ from the historical context, which would further impact historical structures in Rock Creek Park units.

Impacts from WTF construction, operation, and maintenance activities on archeological resources – The construction, operation, and maintenance of WTF could disturb archeological resources within the park during any ground disturbing activity.

Impacts from WTF construction, operation, and maintenance activities on viewsheds inside and outside the park – The presence of WTF could impact the integrity of viewsheds both inside and outside Rock Creek Park units by introducing visual elements into the viewshed that do not contribute to, and may detract from, the natural and cultural viewshed.

Visitor Use and Experience

Impacts from WTF construction, operation, and maintenance activities on visitor use and enjoyment – The construction, operation, and maintenance of WTF could impact a variety of users within Rock Creek Park units. Park users in all units could experience some degradation in their park experience due to the presence of the facilities. Location of WTF within the park may change access to visitation opportunities or introduce a new visual and audible element that impacts the visitor experience.

Socioeconomic Resources

Impacts from WTF construction, operation, and maintenance activities on socioeconomics including property values and public finance – The construction, operation, and maintenance of WTF as a result of

this WTF plan/EA could impact property values in the communities neighboring Rock Creek Park units, and could impact public finance through the right-of-way permit fees paid by the facility owners.

Health and Safety

Impacts to visitor safety resulting from increased telecommunication coverage – The construction, operation, and maintenance of WTF could increase the level of coverage in all Rock Creek Park units. An increase in service could increase the ease and reliability of park users being able to contact emergency services from their wireless phones. However, increased coverage would also increase the ability of park users driving through park units to use their cellular phones while driving, and could result in an increase in traffic accidents.

Impacts to visitor and park staff safety from radiofrequency emissions – The operation and maintenance of WTF in Rock Creek Park units could impact visitor and park staff safety through exposure to radiofrequency emissions from the facilities.

Park Operations and Management

Impacts to park operations and management from processing applications – The siting of WTF in Rock Creek Park units requires staff resources to review applications for this use. An increase or decrease in the number of applications, or a change in the way applications are processed, would impact park staff resources, specifically staff time devoted to the application processes.

Impact Topics Considered but Dismissed from Further Analysis

The following impact topics were eliminated from further analysis and consideration following discussions with the park staff.

Geology, Topography, and Soils. The construction, operation, and maintenance of WTF within the park could create an increase in soil disturbance, leading to increased rates of erosion. However, because of the size and extent of possible WTF sites, this increase in erosion would not be expected to exceed negligible levels. Compaction to soil resources could occur during construction of the facilities, but would also be expected to be negligible due to the size of the facilities and the short 90-day construction timeframe.

Water Resources (Surface Waters, Wetlands, and Floodplains). The construction, operation, and maintenance of WTF within the park could create an increase in soil disturbance, leading to increased rates of erosion. However, the amount of erosion that could reach and impact surface waters would be expected to be negligible because construction, operation, and maintenance would occur in a limited area on a site-specific basis. Because of existing laws and regulations, these facilities would not be permitted to be constructed within a wetland or floodplain, resulting in negligible impacts to these water resources.

Streamflow Characteristics. Actions related to implementation of this WTF plan/EA would not affect streamflow characteristics. The proposed actions would not occur in areas that would impact streamflow.

Marine or Estuarine Resources. There are no marine or estuarine resources in any of the Rock Creek Park units; thus, they would not be impacted by the development and implementation of a WTF plan/EA.

Unique or Important Fish or Fish Habitat. There are no known unique fish or fish habitat listed as occurring in the park. Recently, 33 miles of Rock Creek in Maryland and the District of Columbia have been restored to provide anadromous fish habitat. The construction, operation, and maintenance of WTF

are not expected to impact this newly restored habitat as this habitat is considered sensitive and under any alternative, siting would not be permitted in the areas.

Federally Listed Threatened or Endangered Species. Rock Creek Park units are home to one federally listed threatened species, the Hay's Spring amphipod. This species is found in inland aquatic habitats associated with small springs or seep like areas. In the main unit of Rock Creek Park, these areas of habitat are associated with the Forest Zone or Park Road Zone, as designated under the General Management Plan. As detailed in "Elements Common to All Alternatives" (see "Chapter 2: Alternatives"), applications for WTF would not be granted in these two zones under any alternative. Therefore, since applications would not be granted in areas where the Hay's Spring amphipod is present under any alternative, there would be no impacts to federally listed species.

Prime or Unique Farmland. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses. Unique farmland is land other than prime farmland that is used for the production of high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, fruits, and vegetables. Prime or unique farmland is protected under the *Farmland Protection Policy Act of 1981* to minimize the extent to which federal programs contribute to the unnecessary or irreversible conversion of farmland to nonagricultural uses. There are no prime or unique farmlands within Rock Creek Park units.

Environmental Justice. No known impacts to low-income or minority populations would occur from the implementation of a wireless telecommunication facility plan for Rock Creek Park units. Any potential for increased siting requests in low-income or minority neighborhoods as a result of the plan would be considered under cumulative impacts.

Geohazards. No known geohazards are present within Rock Creek Park units that could be impacted by the implementation of this WTF plan/EA.

Unique Ecosystems, Biosphere Reserves, World Heritage Sites. There are no known biosphere reserves, World Heritage sites, or unique ecosystems listed in any Rock Creek Park unit.

Ethnographic Resources. Ethnographic resources are defined by the NPS as any "site, structure, object, landscape, or natural resource feature assigned traditional, legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (Director's Order #28: Cultural Resource Management Guideline: 181). There are no known ethnographic resources in the areas where permits for WTF would be granted under the alternatives.

Museum Collections. Management of WTF would not affect, alter, or cause harm to any structures or buildings where museum collections are stored.

Paleontological Resources. No known paleontological resources occur within the park.

Traffic and Transportation. This WTF plan/EA would not affect transportation or roadways within or around Rock Creek Park units in terms of traffic volume or congestion. Issues related to the potential for an increase in automobile accidents from cell phone use are addressed under Human Health and Safety.

Energy Resources. There are no such resources identified in Rock Creek Park units.

RELATED LAWS, POLICIES, PLANS, AND ACTIONS

The following laws, policies, and plans by the NPS, the District of Columbia, or other agencies with neighboring land or relevant management authority are described in this section to show the constraints this WTF plan/EA must operate under and the goals and policies that it must meet.

NPS GUIDING LAWS, REGULATIONS, AND POLICIES

Three overarching environmental protection laws and policies guide the NPS in conducting NEPA analysis — NEPA and its implementing regulations, the *National Parks Omnibus Management Act of 1998* (NPOMA), and the *NPS Organic Act*.

5. NEPA is implemented through regulations of the CEQ (40 CFR Parts 1500–1508). The NPS has in turn adopted procedures to comply with the act and the CEQ regulations, as found in NPS Director’s Order #12, Conservation Planning, Environmental Impact Analysis, and Decision-making (2001), and its accompanying handbook, and the Department of the Interior regulations implementing NEPA (Department Manual 12).
6. NPOMA (16 USC § 5901 et seq.) underscores NEPA in that both are fundamental to NPS park management decisions. Both acts provide direction for articulating and connecting the ultimate resource management decision to the analysis of impacts, using appropriate technical and scientific information. Both also recognize that such data may not be readily available, and they provide options for resource impact analysis should this be the case.
7. NPOMA directs the NPS to obtain scientific and technical information for analysis. The NPS handbook for Director’s Order #12 states that if “such information cannot be obtained due to excessive cost or technical impossibility, the proposed alternative for decision will be modified to eliminate the action causing the unknown or uncertain impact or other alternatives will be selected” (sec. 4.4).

Section 4.5 of Director’s Order #12 adds to this guidance by stating, “when it is not possible to modify alternatives to eliminate an activity with unknown or uncertain potential impacts, and such information is essential to making a well-reasoned decision, the NPS will follow the provisions of the regulations of CEQ (40 CFR Part 1502.22).” In summary, the NPS must state in an environmental assessment or impact statement (1) whether such information is incomplete or unavailable; (2) the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment; (3) a summary of existing credible scientific adverse impacts relevant to evaluating the reasonably foreseeable significant adverse impacts; and (4) an evaluation of such impacts based on theoretical approaches or research methods generally accepted in the scientific community.

8. The 1916 NPS *Organic Act* (16 USC § 1) commits the NPS to making informed decisions that perpetuate the conservation and protection of park resources unimpaired for the benefit and enjoyment of future generations. In the *Organic Act*, Congress directed the U.S. Department of the Interior and the NPS to manage units of the national park system “to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations” (16 USC § 1). Congress reiterated this mandate in the *Redwood National Park Expansion Act of 1978* by stating that NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established,

except as may have been or shall be directly and specifically provided by Congress” (16 USC § 1a-1).

The *Organic Act* and its amendments afford the NPS latitude when making resource decisions about visitor recreation and resource preservation. Despite this discretion, courts consistently interpret the *Organic Act* and its amendments to elevate resource conservation above visitor recreation. See *Michigan United Conservation Clubs v. Lujan*, 949 F.2d 202, 206 (6th Cir. 1991) (holding that in enacting the *Organic Act* “Congress placed specific emphasis on conservation”); *National Rifle Ass’n of America v. Potter*, 628 F. Supp. 903, 909 (D.D.C. 1986) (stating that “in the *Organic Act* Congress speaks of but a single purpose, namely, conservation”). By these acts Congress “empowered [the NPS] with the authority to determine what uses of park resources are proper and what proportion of the parks resources are available for each use” (*Bicycle Trails Council of Marin v. Babbitt*, 82 F.3d 1445, 1453 [9th Cir. 1996]). The *NPS Management Policies 2006* also recognize that resource conservation takes precedence over visitor recreation. The policy dictates “when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant” (NPS 2006, sec. 1.4.3).

Because conservation remains predominant, the NPS seeks to avoid or to minimize adverse impacts on park resources and values. Yet, the NPS has discretion to allow negative impacts when necessary and appropriate to fulfill the purposes of the park, as long as the impact does not constitute an impairment (NPS 2006, sec. 1.4.3).

While some actions and activities cause impacts, the NPS cannot allow an adverse impact that constitutes resource impairment (NPS 2006, sec. 1.4.3). The *Organic Act* prohibits actions that permanently impair park resources unless a law directly and specifically allows for the action (16 USC § 1a-1). An action constitutes an impairment when its impacts “harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006, sec. 1.4.5). To determine impairment, the NPS must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006, sec. 1.4.5). This WTF plan/EA, therefore, analyzes the effects of the management alternatives on park resources and values and determines if these effects would cause impairment.

NPS Management Policies 2006 require an analysis of potential effects to determine whether or not actions would impair park resources (NPS 2006). The fundamental purpose of the national park system is to conserve park resources and values for the use and enjoyment of future generations. NPS managers have the discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. That discretion to allow certain impacts within the park is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible manager, would harm the integrity of park resources or values. An impairment is a subset of major adverse impacts that has an effect on a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park,
- Key to the natural or cultural integrity of the park, or

- Identified as a goal in the park’s general management plan or other relevant NPS planning documents.

Other applicable NPS guiding laws, regulations, and policies include the following.

Redwood National Park Act of 1978, as Amended

All national park system units are to be managed and protected as parks, whether established as a recreation area, historic site, or any other designation. This act states that the NPS must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.”

Code of Federal Regulations, Revised July 2000

Title 36, Chapter 1 provides the regulations “for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the National Park Service.” It states that “the National Park Service has the authority to manage the wildlife in the parks in fulfillment of the *Organic Act* without the consent of the state and by methods contrary to state law” (16 USC § 3). Regulations specific to the National Capital Region which includes Rock Creek Park are in 36 CFR Part 7.96, and those specific to issuing right-of-way permits for WTF are provided in 36 CFR Part 14, and described below under the authorities specific to WTF.

SPECIFIC AUTHORITIES AND GUIDANCE FOR SPECIAL PARK USES INCLUDING RIGHT-OF-WAY PERMITS FOR WIRELESS TELECOMMUNICATION FACILITIES

Telecommunications Act of 1996, P.L. No. 104-104, 110 Stat. 56 § 704(c), 47 USCA § 332 note

The *Telecommunications Act of 1996* was enacted “to promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies” [Public Law No. 104-104, 110 Stat. 56 (1996)]. Section 704(c) of the *Telecommunications Act of 1996* and its regulations make federal property, including parkland, available for placement of telecommunications equipment by duly authorized providers absent unavoidable conflicts with the department or agency’s mission, or the current or planned use of the property, or access to that property. Due to the requirements that federal agencies must follow, WTF applications are treated differently than most other applications made for special park uses.

Presidential Memorandum: Facilitating Access to Federal Property for the Siting of Mobile Service Antennas (1995), 60 FR 42023, 40 USC § 581, note, 1995

The Presidential Memorandum of August 10, 1995, “Facilitating Access to Federal Property for the Siting of Mobile Services Antennas,” directs the heads of all departments and agencies to facilitate appropriate access to federal property for the purpose of siting mobile services antennas, as long as such siting is in accordance with federal, state, and local laws and regulations, environmental and aesthetic concerns, preservation of historic buildings and monuments, protection of natural and cultural resources, and protection of national park and wilderness values.

Federal Communications Commission (FCC) environmental regulations, 47 CFR Part 1.1307, delegate the environmental responsibilities of the FCC to their licensees and other applicants, as follows:

- Lists eight areas or situations that are considered environmentally sensitive and requiring preparation of an EA prior to construction.
- Requires an EA if the antenna transmitter would cause exposure of workers or the general public to levels of radiofrequency radiation in excess of certain guidelines...
- Allows “an interested person” to petition the [FCC] to require environmental consideration in its decision-making process where such analysis would not otherwise be required by the rules...
- Allows the [agency] responsible for processing an action which may otherwise be excluded from an EA, to require environmental consideration of that action upon its own motion.
- Unless otherwise prohibited by or inconsistent with federal law, agencies shall charge fees based on market value for siting antennas on federal property, and may use competitive procedures if not all applicants can be accommodated.

GSA Bulletin FMR 2007-B2, Placement of Commercial Antennas on Federal Property, 72 FR 11881, March 14, 2007

FMR 2007-B2 is the General Services Administration (GSA)-issued government-wide procedures for the placement of commercial antennas on federal property in order to implement the 1995 Presidential Memorandum and Section 704(c) of the *Telecommunications Act of 1996*. This 2007 bulletin replaces FPMR-242. The bulletin directs federal agencies to evaluate siting requests and determine if there would be unavoidable conflicts with the department’s or agency’s mission, or current or planned use of the property or access to that property. In evaluating siting requests, agencies should include consideration of the requirements of the federal agency managing the facility. Actions to be taken by federal agencies under these guidelines include determining the impact to their properties, review of internal agency rules, dissemination of antenna guidelines, timely response to siting requests, maintaining open communications, and establishing points of contact. These guidelines also address the need to consult with the NCPC for projects in the Washington, D.C. area, such as Rock Creek Park managed units.

These guidelines also direct federal agencies to take into consideration environmental and historic preservation issues during siting, that should include, but not be limited to the following:

- Public health and safety;
- Aesthetics;
- Effects of historic districts, sites, buildings, monuments, structures, or other objects pursuant to the NHPA and implementing regulations;
- Protection of natural and cultural resources;
- Compliance with the appropriate level of review and documentation as necessary under NEPA and implementing regulations or each federal department and agency responsible for antenna siting; and
- Compliance with the FCC guidelines for radiofrequency exposure.

When looking at siting requests, the GSA bulletin requires the following:

- Requests for the use of property, rights-of-way, and easements by duly authorized telecommunication service providers should be granted unless there are unavoidable conflicts

with the department's or agency's mission or current or planned use of the property or access to the property. A denial of a siting request based on these criteria should be fully explained in writing.

- Executive departments and agencies shall retain discretion to reject inappropriate siting requests and assure adequate protection of public property.
- All procedures and mechanisms adopted by executive departments and agencies regarding access to federal property should be clear and simple to facilitate the efficient build out of the national wireless communications infrastructure.
- The telecommunications service provider is responsible for any reasonable costs to federal agencies associated with providing access to antenna sites.
- Agencies are authorized to charge reasonable fees for antenna sites on federal property and they should be based on fair market value.
- Executive departments and agencies will make antenna sites available on a fair, reasonable, and nondiscriminatory basis. Co-location of antennas should be encouraged where there are multiple antenna siting requests for the same location. In cases where this is not feasible and space availability precludes accommodating all antenna siting applicants, competitive procedures may be used.
- The siting of telecommunication service provider antennas should not be given priority over other authorized uses of federal building or lands.

16 USC § 5, Rights of Way and 36 CFR Part 14, Rights of Way

These sections of the United States Code and the Code of Federal Regulations address the management of right-of-way permits on NPS lands. These are revocable permits, and not leases or any other estate or interest in land. These regulations contain terms and conditions for rights-of-way on NPS lands such as:

- Compliance with state and federal laws applicable to the project for which the right-of-way was approved.
- To clear and to keep clear the lands within the right-of-way to the extent and in the manner directed by the Superintendent; and to dispose of all vegetative and other material cut, uprooted, or otherwise accumulated during the construction and maintenance of the project in such manner as to decrease the fire hazard.
- Take soil and resource conservation and protection measures including weed control.
- Build and repair roads, fences, and trails as may be destroyed or injured by construction work and to build and maintain necessary and suitable crossings for all roads and trails that intersect the works constructed, maintained, or operated under the right-of-way.
- Payment to the United States for the full value for all damages to the land or other property arising from the occupancy or use of lands under the right-of-way.
- Upon revocation or termination of the right-of-way permit, unless the requirement is waived in writing, so far as it is reasonably possible to do so, restore the land to its original condition to the entire satisfaction of the Superintendent.
- The allowance of the right-of-way shall be subject to the express condition that it will not unduly interfere with the management and administration of these lands by the United States.

NPS Management Policies 2006

This is the basic NPS-wide policy document, adherence to which is mandatory unless specifically waived or modified by the NPS Director or certain Departmental officials, including the Secretary. Several sections from the *NPS Management Policies 2006* (NPS 2006) are particularly relevant to processing applications for WTF at Rock Creek Park, as described below. Some of these provisions that are contained in the following NPS policy documents echo those contained in the *Telecommunications Act of 1996*, the 1995 Presidential Memorandum, and the GSA-issued government-wide procedures. Actions under this WTF plan/EA are in part guided by Section 8.6.4.3 of the *NPS Management Policies 2006*, which directs parks to consider requests to site non-NPS telecommunication facilities on NPS lands in accordance with the *Telecommunications Act of 1996*. The policy notes that this act authorized, but does not mandate a presumption that such requests will be granted absent an unavoidable conflict with the agency mission, or the current or planned use of the property or access to that property (This presumption is instead contained in the government wide procedures). The NPS policies require that:

- Superintendents will accept an application for a telecommunication site only from a FCC licensee or from an agency regulated by the Department of Commerce through the National Telecommunications and Information Administration.
- The manner in which the park will manage the technology and related facilities should be addressed in an appropriate NEPA document.
- When considering whether to approve, deny, or renew permits, the Superintendent will:
- Hold preliminary meetings with telecommunication facility applicants to discuss pending applications and policy and procedural issues (such as the application process, impact analysis, estimated cost recovery charges and fees) and other NPS concerns. Similar meetings should be held during the decision-making process, as necessary, particularly if the superintendent is considering denying the application;
 - Conduct NEPA and NHPA analysis expeditiously and consistent with all applicable statutes and Director's Order #12, and within timetables established pursuant to Director's Order #53;
 - Consider the potential benefit of having telephone access to emergency law enforcement and public safety services; and
 - Consider whether the proposal would cause unavoidable conflict with the park's mission, in which case the permit will be denied.
- Superintendents will evaluate the entire footprint of the new facilities when considering applications (e.g., all utilities related to the facility).
- Superintendents will avoid or minimize potential impacts of current and future telecommunication facilities by ensuring that the facilities and their supporting infrastructure:
 - Are located where they would have the least impact on park resources and values;
 - Are not located in the scenic, historic, and/or sensitive areas integral to the park's mission; and
 - Include maximum potential for future co-location.
- Superintendents will require the best technology available.
- Superintendents should consider making use of available interpretive media to caution park users of the limited or nonexistent cellular service and their personal responsibility to plan accordingly.

- When construction of telecommunication facilities on non-park land might adversely impact park resources and values, superintendents will actively participate in the applicable planning and regulatory process and seek to prevent or mitigate the adverse impacts.

NPS Director's Order #53 (2000)

This director's order, entitled Special Park Uses, establishes that a special park use is a short-term activity that takes place in a park area and (1) provides a benefit to an individual, group or organization, rather than the public at large; (2) requires written authorization and some degree of management control from the NPS in order to protect park resources and the public interest; (3) is not prohibited by law or regulation; and (4) is neither initiated, sponsored, nor conducted by the NPS. In relation to applications for WTF in NPS park units, Director's Order #53 directs the NPS to comply with the *Telecommunications Act of 1996* as follows:

- Encourage preliminary meetings with telecommunications industry companies [PCS providers] who wish to discuss pending or proposed applications for sites in the park to explain park concerns and understand industry timeframes.
- Encourage meetings with the applicants during the post application decision process as necessary, but especially if the manager is considering denying the application. Such meetings should take place prior to written notification of denial.
- Consider the safety of the visiting public when reviewing telecommunications site applications, including the potential benefit of having telephone access to emergency law enforcement and public safety services.
- Ensure that, when an application is submitted, the park replies in writing within 10 business days with an initial response on the application, and that response will be 'yes' (probably a known categorical exclusion requiring very minor additional information to be submitted), 'no' (with reasons in writing), or 'maybe' (with additional information to be submitted).
- Ensure that, to the extent possible, the timeline and detailed steps enumerated in RM-53 are followed and the permit is issued or denied.
- Ensure that compliance actions and reviews will be conducted expeditiously and consistent with all applicable statutes.

The NPS general authority to issue right-of-way permits for uses such as WTF is found in 16 USC § 5, and NPS regulations at 36 CFR Part 14. RM-53 provides the NPS process for consideration and placement of these facilities on park land.

NPS Reference Manual #53 (2000)

RM-53, the accompanying reference document for NPS Director's Order #53, provides direction to the NPS in the processing and evaluation of applications for right-of-way permits on NPS managed lands. Appendix 5, Exhibit 6 of RM-53 provides guidance specific to applications for siting WTF on NPS property. The procedures set out in the manual are described in "Chapter 2: Alternatives" of this WTF plan/EA (in the description of actions common to all alternatives) and include requirements for pre-application, such as a pre-application meeting with the park, and procedures once an application is received. These procedures provide a 120-day timeline for the park to process applications for WTF. In addition to these procedures, RM-53 sets out the following guidelines:

- Superintendents who have or expect to receive multiple requests for WTF sites will encourage co-location where possible.

- Right-of-way permits will only be issued for those requests for which there are no practicable alternatives and will not result in a derogation of the resources, values, and purposes for which the park was established.
- Superintendents will only accept applications for a WTF site from a FCC licensee authorized to provide the service.
- The public will be given the opportunity to participate fully and comment on applications for right-of-way permits to construct WTF sites on park property.
- Superintendents may wish to quickly identify critical resource areas, operational needs, and existing infrastructure. This is a completely optional process. Such an effort is intended only to provide basic, preliminary information so as to expeditiously inform the park manager about potentially suitable WTF sites, or areas where WTF may not be approved. This process is not conducted in lieu of coordinated NEPA and NHPA compliance.
- The superintendent assures proper compliance (for instance, NEPA, NHPA etc.) is accomplished for each WTF application. Compliance may be performed by park staff or contractor; the applicant is responsible for payment of all compliance costs regardless of who performs them.
- Parks may use standard procedures to determine the land and/or facility use fee for WTF sites.
- Parks will encourage meetings with WTF applicants at any time during the decision-making process as necessary, particularly if the park is considering denying the application. In such instances, the applicant will be given an opportunity to discuss the pending application and the park's concerns before a final decision is made.
- Parks will consider the safety of the visiting public as a factor for reviewing WTF applications. Public safety, in this context, refers to telephonic access to emergency law enforcement and public safety services.
- To the extent possible, where an EA may be sufficient to satisfy NEPA compliance, parks should seek to complete the environmental review process within 120 days of receipt of application. To the extent possible, if an EA reveals a need for an environmental impact statement (EIS), this additional process should be completed within 12 to 18 months of receipt of application. If for some reason, delays occur or are expected to occur in either the EA or EIS process, the park should inform the applicant of the probable delay, the reason(s) for it, and discuss an expected time frame for completion.

U.S. Fish and Wildlife Service Guidelines on Siting Telecommunications Facilities (2000)

These guidelines, released by the USFWS in 2000, address the potential for significant impacts on migratory birds from the construction of WTF. The USFWS guidelines are applicable to the review of proposed tower siting and/or the evaluation of towers on migratory birds. Although drafted by the USFWS, the following guidelines are also considered in NPS decisions on WTF right-of-way permits. These guidelines include:

1. Encourage co-location where possible.
2. If co-location is not feasible and a new tower or towers are to be constructed, communications service providers should be strongly encouraged to construct towers no more than 199 feet above ground level (AGL), using construction techniques which do not require guy wires (e.g., use a lattice structure, self-supporting steel structure, etc.). Such towers should be unlighted if Federal Aviation Administration (FAA) regulations permit.

3. If constructing multiple towers, providers should consider the cumulative impacts of all of those towers to migratory birds and threatened and endangered species as well as the impacts of each individual tower.
4. If at all possible, new towers should be sited within existing “antenna farms” (clusters of towers). Towers should not be sited in or near wetlands, other known bird concentration areas (e.g., state or federal refuges, staging areas, and rookeries) in known migratory or daily movement flyways, or in habitat of threatened or endangered species. Towers should not be sited in areas with a high incidence of fog, mist, and low ceilings.
5. If taller towers (greater than 199 feet AGL) requiring lights for aviation safety must be constructed, the minimum amount of pilot warning and obstruction avoidance lighting required by the FAA should be used. Unless otherwise required by the FAA, only white (preferable) or red strobe lights should be used at night, and these should be the minimum number, minimum intensity, and minimum number of flashes per minute (longest duration between flashes) allowable by the FAA. The use of solid red or pulsating red warning lights at night should be avoided. Current research indicates that solid or pulsating (beacon) red lights attract night-migrating birds at a much higher rate than white strobe lights. Red strobe lights have not yet been studied.
6. Tower designs using guy wires for support which are proposed to be located in known raptor or waterbird concentration areas or daily movement routes, or in major diurnal migratory bird movement routes or stopover sites, should have daytime visual markers on the wires to prevent collisions by these diurnally moving species.
7. Towers and associated facilities should be sited, designed and constructed so as to avoid or minimize habitat loss within and adjacent to the tower “footprint.” However, a larger tower footprint is preferable to the use of guy wires in construction. Road access and fencing should be minimized to reduce or prevent habitat fragmentation and disturbance, and to reduce above ground obstacles to birds in flight.
8. If significant numbers of breeding, feeding, or roosting birds are known to habitually use the proposed tower construction area, relocation to an alternative site should be recommended. If this is not an option, seasonal restrictions on construction may be advisable in order to avoid disturbance during periods of high bird activity.
9. New towers should structurally and electrically accommodate the applicant/licensee’s antennas and comparable antennas for at least two additional users (minimum of three users for each tower structure), unless this design would require the addition of lights or guy wires to an otherwise unlighted and/or unguyed tower.
10. Security lighting for on-ground facilities and equipment should be down-shielded to keep light within the boundaries of the site.
11. If a tower is constructed or proposed for construction, service personnel or researchers from the Communications Tower Working Group should be allowed access to the site to evaluate bird use.
12. Towers no longer in use or determined to be obsolete should be removed within 12 months of cessation of use.

National Capital Planning Commission Guidelines and Submission Requirements for Antennas on Federal Property in the National Capital Region

The NCPC serves as the central federal planning agency for federal activities and interests in the National Capital Region. Its authorities are mainly in 40 USC 8701-8737, and also appear in the D.C. Code. Federal government projects in the region that will alter the exterior appearance of a site must be presented to the NCPC for comment, review, and, in some cases, approval. Pursuant to 40 USC § 8722(b), NCPC considers WTF applications prior to NPS issuance of these right-of-way permits. This NCPC role is also listed in the GSA-issued government-wide procedures. NCPC review of WTF is conducted in accordance with its guidance, Guidelines and Submission Requirements for Antennas on Federal Property in the National Capital Region, which was first published in 1988 and last amended in 2001.

The NCPC guidelines direct federal agencies to evaluate the proposal based on applicable criteria, and assess the effects of the proposal pursuant to NEPA and the NHPA. If the federal agency determines that the proposal meets applicable criteria, the agency shall submit the proposal to the NCPC for review, prior to signing a lease or permitting the installation of the telecommunication facility.

Under the NCPC's Guidelines, an installation will normally be permitted for five years. This period may be increased to 10 years at the NCPC's discretion where the proposed antenna(s) will not have an adverse impact on the Monumental Core and the surrounding lands, designated historic buildings or districts, or nearby residential areas; provided that the NCPC is satisfied that the wireless telecommunication technology proposed is not likely to be replaced in the next 10 years by new technology that could either reduce the visibility or radiofrequency levels of the proposed equipment.

Criteria applied to WTF proposals by the NCPC would include:

- Proposals for installation of antennas on federal property shall be consistent with the applicable policies and implementation strategies contained in the federal elements of the *Comprehensive Plan for the National Capital* (NCPC 2004).
- The location of towers, antennas, or similar structures in or adjacent to the federal park system should be discouraged, to the extent possible.
- In rare instances where antennas or towers must be located within a federal park or open space, they shall conform to the *Commission's Guidelines for Antennas on Federal Property in the National Capital Region* as well as the following:
 - Every effort should be made to avoid locating antennas and tower structures within the viewsheds of established natural and cultural landscapes and open spaces.
 - Innovative designs that reduce the visibility of antennas and towers in a natural setting should be encouraged.
- Federal and local agencies should, to the extent practical, identify appropriate locations for the siting of antennas and towers through their master plans and comprehensive plans.
- All antennas and their support structures including towers, monopoles, and equipment shelters erected within the District of Columbia shall be consistent with the provisions of the *Height of Buildings Act of 1910*.
- To the extent possible, federal agencies should anticipate the need for antennas on all new buildings and design such buildings to screen the needed antennas in a manner appropriate to the

building's design. Antenna requirements should also be considered and included as part of federal agency master plans.

- Installations in the National Capital Region should be designed and installed in a manner that minimizes or eliminates the visibility of the antenna and all support structures from adjacent properties. Where appropriate to the character of a building, retrofitting to screen antennas not accommodated in original building designs, and plans should be provided.
- Because of the numerous variables regarding power and frequency levels for each installation, radiofrequency impacts should be evaluated on a site-specific basis, taking into account any existing nearby emission sources in compliance with guidelines established by the FCC.
- Rooftop antennas should be installed at the lowest possible elevation above the roof line, set back from the edge of the building at a distance at least equal to the antenna's height above the roof, and screened as appropriate from any public views in cases in which screening designs compatible with the architectural character of the building can be developed.
- Ground level antennas should be sited in locations that minimize public views, installed at the lowest possible elevation above grade, as screened to the extent practicable by landscaping and screening elements that reduce visual impacts as well as radiofrequency radiation.
- The screening plan should respond to public safety concerns by restricting public access near ground-mounted and roof-mounted antennas.
- Materials used in the construction of antennas and their mounting should not be bright, shiny, or reflective and should be of a color that blends with the building's materials or landscape.
- Any masts or towers should be non-combustible, corrosion resistant or protected, and protected against electrolytic action.
- No commercial advertising shall be allowed on an antenna support structure.
- No signals, lights, or illumination shall be permitted on antennas or support structures unless required by the FCC, the FAA, or other federal government agency.
- The NCPC shall receive written notification upon the removal of all antennas that no longer need to be located on federal property or upon the completion of their approval period.

Commission of Fine Arts Authority Under the Shipstead-Luce and Old Georgetown Acts

The CFA was established by Congress in 1910 as an independent agency to advise the federal and District of Columbia governments on matters of art and architecture that affect the appearance of the Nation's Capital. Its primary authority is in 40 USC 9101-9104, and there are also provisions in the D.C. Code. The CFA's primary role is to advise on proposed public building projects, but it also reviews private buildings adjacent to public buildings and grounds of major importance, including Rock Creek Park (under the *Shipstead-Luce Act*) and projects in the Historic District of Georgetown (under the *Old Georgetown Act*).

The *Shipstead-Luce Act*, 40 USC § 8104(b), gives the CFA the authority to review the designs of private construction projects within certain areas of the capital. This review process provides the NPS with the opportunity to comment on any WTF sitings located adjacent to the park boundaries through coordination with the CFA, although NPS does not have approval authority through this process.

OTHER APPLICABLE FEDERAL LAWS, EXECUTIVE ORDERS, REGULATIONS, AND POLICIES

The NPS is also required to comply with the following laws, executive orders, regulations, and policies in developing this WTF plan/EA.

Endangered Species Act of 1973, as Amended

This act requires all federal agencies to consult with the Secretary of the Interior on all projects and proposals with the potential to impact federally endangered or threatened plants and animals.

National Historic Preservation Act of 1966, as Amended

Section 106 of this act requires federal agencies to consider the effects of their undertakings on properties listed or potentially eligible for listing on the National Register. All actions affecting the park's cultural resources must comply with this law, which is implemented through 36 CFR Part 800.

Historic Sites Act of 1935

This act declares as national policy the preservation for public use of historic sites, buildings, objects, and properties of national significance. It authorizes the Secretary of the Interior and the NPS to restore, reconstruct, rehabilitate, preserve, and maintain historic or prehistoric sites, buildings, objects, and properties of national historical or archaeological significance.

Federal Noxious Weed Act, 1975

The *Federal Noxious Weed Act* (7 USC §§ 2801-2814, January 3, 1975, as amended 1988 and 1994) provides for the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.

Executive Order #13186 – Responsibilities of Federal Agencies to Protect Migratory Birds (2001)

Migratory birds are of great ecological and economic value to this country and to other countries. They contribute to biological diversity and bring tremendous enjoyment to millions of Americans who study, watch, feed, or hunt these birds throughout the United States and other countries. The United States has recognized the critical importance of this shared resource by ratifying international, bilateral conventions for the conservation of migratory birds. Such conventions include the Convention for the Protection of Migratory Birds with Great Britain on behalf of Canada 1916, the Convention for the Protection of Migratory Birds and Game Mammals-Mexico 1936, the Convention for the Protection of Birds and Their Environment-Japan 1972, and the Convention for the Conservation of Migratory Birds and Their Environment-Union of Soviet Socialist Republics 1978. These migratory bird conventions impose substantive obligations on the United States for the conservation of migratory birds and their habitats, and through the *Migratory Bird Treaty Act*, the United States has implemented these migratory bird conventions with respect to the United States. This executive order directs executive departments and agencies to take certain actions to further implement the act. The WTF plan/EA will consider this executive order and the potential impacts of the alternatives to migratory birds.

Executive Order #13112 – Invasive Species (1999)

This executive order requires the NPS to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Executive Order #11593 – Protection and Enhancement of the Cultural Environment (1971)

This executive order directs the NPS to support the preservation of cultural properties and to identify and nominate to the National Register cultural properties within the park and to “exercise caution . . . to assure that any NPS-owned property that might qualify for nomination is not inadvertently transferred, sold, demolished, or substantially altered.”

Director’s Order #28 – Cultural Resource Management (1998)

NPS Director’s Order #28 directs the NPS to protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principals contained in the NPS *Management Policies 2006*. This director’s order is carried out through the NPS 28 Cultural Resource Management Guideline that provides the fundamental concepts of cultural resource management for the NPS.

ROCK CREEK PARK SPECIFIC GUIDANCE AND POLICY

National park system units are established by Congress to fulfill specified purposes. A park’s purpose is the fundamental building block for its decisions to conserve resources while providing for the “enjoyment of future generations.” Rock Creek Park, as an administrative unit of the national park system, is composed of 99 separate areas, known as reservations, located in the northern part of Washington, D.C. (NPS 2002a). The park legislation and planning documents vary for each unit of the park. The following provides the enabling legislation for the three largest units managed by Rock Creek Park—Rock Creek Park, Rock Creek and Potomac Parkway, and the Fort Circle Parks.

Purpose and Significance of Rock Creek Park Units

Rock Creek Park (Reservation 339)

Establishment — Congress established Rock Creek Park, one of the first national park areas, on September 27, 1890, as a unique natural park containing significant historic and archeological resources, and providing a great variety of recreational opportunities for visitors and residents of the Washington, D.C. metropolitan area (Pub. L. 51-297, 26 Stat. 482), with management of Rock Creek Park becoming the responsibility of the NPS in 1933. As its enabling legislation states, Rock Creek Park was “perpetually dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people of the United States.”

Purpose — The 1890 enabling legislation for Rock Creek Park states that:

- The area is to be “perpetually dedicated and set apart as a public park or pleasure ground for the benefit and enjoyment of the people of the United States.”
- The park is to “provide for the preservation from injury or spoliation of all timber, animals, or curiosities within said park, and their retention in their natural condition, as nearly as possible.”

- Park managers are directed to provide for public recreation, specifically to “lay out and prepare roadways and bridle paths, to be used for driving and for horseback riding, respectively, and footways for pedestrians.”

The legislation also states that Rock Creek Park exists to:

- Preserve and perpetuate for this and future generations the ecological resources of the Rock Creek valley within the park in as natural a condition as possible, the archeological and historic resources in the park, and the scenic beauty of the park.
- Provide opportunities for the public to experience, understand, and appreciate the park in a manner appropriate to the preservation of its natural and cultural resources.
- Provide opportunities for recreation appropriate to the park’s natural and cultural resources.
- The purpose of the tributary parks adjacent to Rock Creek Park proper is to (NPS 2002b):
- Preserve the flow of water in Rock Creek.
- Prevent the pollution of Rock Creek and the Potomac River.
- Preserve forests and natural scenery in and around Washington, D.C.

Significance — Park significance statements capture the essence of the park’s importance to the nation’s natural and cultural heritage. Understanding park significance helps managers make decisions that preserve the resources and values necessary to the park’s purpose. The following significance statements recognize the important features of the park.

- Rock Creek Park is one of the oldest and largest naturally managed urban parks in the United States.
- The park contains approximately 1,700 acres of valuable plant and wildlife habitat, providing protection for a variety of native species within a heavily urbanized area.
- Rock Creek Park encompasses a rugged stream valley of exceptional scenic beauty with forested, natural landscapes and intimate natural details, in contrast to the surrounding cityscape of Washington, D.C.
- Rock Creek Park’s forests and open spaces help define the character of the Nation’s Capital.
- Rock Creek valley was important in the early history of the region and in the development of the Nation’s Capital and the park’s cultural resources are among the few tangible remains of the area’s past and is listed on the National Register of Historic Places.
- Rock Creek Park is an oasis for urban dwellers, offering respite from the bustle of the city.
- Rock Creek Park is a historic designed landscape incorporating early 20th century picturesque and rustic features designed to enhance the visitors’ experience of the naturalistic park scenery.
- Located in the heart of a densely populated cosmopolitan area, Rock Creek Park serves as an ambassador for the national park idea, providing outstanding opportunities for education, interpretation, and recreation to foster stewardship of natural and cultural resources.

Rock Creek and Potomac Parkway (Reservation 360)

Establishment — The Rock Creek and Potomac Parkway was established by the *Public Buildings Act of March 4, 1913*, Section 22 (P.L. 106–580).

Purpose — Based on the enabling legislation, the Rock Creek and Potomac Parkway exists to (NPS 2002a):

- Connect Rock Creek Park and the National Zoological Park (National Zoo) to Potomac Park with a scenic road.
- Prevent pollution and obstruction of Rock Creek.

Significance — The following significance statements recognize the important features of the parkway.

- The Rock Creek and Potomac Parkway provides a scenic gateway to the city’s monumental core.
- Rock Creek Park is a historic designed landscape incorporating early 20th century picturesque and rustic features designed to enhance the visitors’ experience of the naturalistic park scenery.

Fort Circle Parks

The Fort Circle Parks managed by Rock Creek Park are defined as Battery Kemble, Fort Bayard, Fort Reno, Fort DeRussy, Fort Stevens, Fort Slocum, Fort Totten, Fort Bunker Hill, Battleground Cemetery, Barnard Hill, and the land connecting these units, as stated in the Fort Circle Parks Management Plan / Environmental Assessment (NPS 2004b).

Establishment — The monies used by the NPS to acquire the Fort Circle Parks were appropriated by the *Capper-Cramton Act of 1930*. This act appropriated funds for the further acquisition of “...such lands in the District of Columbia as are necessary and desirable for the suitable development of the National Capital Park, parkway, and playground system...” (NPS 2004b).

Purpose — The Fort Circle Parks Management Plan / Environmental Assessment states that the purpose of the Fort Circle Parks is to (NPS 2004b):

- Preserve and interpret historical resources related to the Civil War defenses of Washington.
- Conserve this linkage or urban green spaces that contribute to the natural character and scenic values of the Nation’s Capital.
- Provide recreational opportunities compatible with historic and natural resource values.
- Protect the forests and natural scenery and to prevent the pollution of park waterways.

Significance — The Fort Circle Parks Management Plan / Environmental Assessment (NPS 2004b) states that the significance of the Fort Circle Parks is:

- The park sites contain remains of the defense sites (e.g., forts, batteries, rifle trenches) that effectively deterred the invasion of the Nation’s Capital during the Civil War.
- The Fort Circle Parks include the remains of forts that were engaged in the Battle of Fort Stevens in July 1864 – the only Civil War battle in the District of Columbia and the only time a sitting U.S. president has come under enemy fire in warfare.
- The pattern (greenbelt) of public space of Fort Circle Parks represents an element of one of the earliest urban planning efforts for public recreation in the United States (as first suggested in the 1902 Improvement of the Park System of the District of Columbia [also known as the McMillan Plan] and the 1926–1927 National Capital Planning Commission Plan). Today it enhances the aesthetics of the capital city and the quality of life for its citizens.

- The Fort Circle Parks preserve significant natural features, including substantial acreage of mature native hardwood forests, geologic and aquatic resources, and a diversity of important habitat for indigenous flora and fauna that are unusual in an urban setting and that contribute to the uniqueness of the Nation's Capital.

Rock Creek Park Planning Documents

The purpose, need, and objectives need to be, to a large degree, consistent with the park's planning documents. These documents include the 2005 Rock Creek Park and the Rock Creek and Potomac Parkway Final General Management Plan/EIS, the 2007 Record of Decision on the Rock Creek and Potomac Parkway Final General Management Plan/EIS, the 2004 Fort Circle Parks Management Plan/Environmental Assessment, the 1996 Resources Management Plan, and various cultural and natural resource management documents. The documents discussed below are available on line or through requesting them from the park.

Rock Creek Park and Rock Creek and Potomac Parkway Final General Management Plan/EIS (2005)

The 2005 Rock Creek Park and Rock Creek and Potomac Parkway Final GMP is the basic guidance document for the management of these units for the next 10 to 15 years. The purpose of the GMP is to specify resource conditions and visitor experiences to be achieved in the park and parkway, and to provide the foundation for decision-making and preparation of more specific resource plans regarding the management of the park and parkway. The 2005 GMP is the first comprehensive plan prepared for Rock Creek Park. The central issue for management planning in Rock Creek Park is how to meet the often conflicting purposes of protecting the scenic, natural, and cultural resources of the park, while concurrently providing for appropriate public use of these resources.

The GMP outlines the following desired conditions for Rock Creek Park and the Rock Creek and Potomac Parkway that would be applicable to a WTF plan/EA:

- Natural Resource Management Requirements
 - Park activities do not contribute to the deterioration in air quality.
 - NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface waters and groundwater.
 - Natural floodplains are preserved or restored.
 - Natural soil resources and processes function in as natural a condition as possible, except where special management considerations are allowable under policy.
 - Federal- and District-listed threatened or endangered species and their habitats are protected and sustained.
 - Native plant and animal species function in as natural a condition as possible, except where special management considerations are allowable under policy.
 - Invasive species are reduced in numbers and area, or are eliminated from natural areas of the park.
- Cultural Resource Management Requirements
 - Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. In

those cases where disturbance or deterioration is unavoidable, the site may be professionally documented and salvaged.

- Qualities of historic properties, such as historic structures and cultural landscapes, which contribute to their listing or eligibility are protected in accordance with the Secretary of the Interior's standards unless it is determined through formal processes that disturbance or natural deterioration is unavoidable.
- Visitor Experience and Park Use Requirements
 - A safe and healthful environment is provided for visitors and employees.
 - Park visitors assume a substantial degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments.
 - Visitors understand and appreciate park values and resources and have the information necessary to adapt to the park environments. Visitors have opportunities to enjoy the park in ways that leave park resources unimpaired for future generations.
 - Park recreational uses are promoted and regulated, basic visitor needs are met in keeping with the park purpose.
 - Facilities, programs, and services are accessible to and usable by all people, to the extent feasible.
- Special Use Management Requirements
 - Park resources or public enjoyment of the park are not denigrated by nonconforming uses.
 - Only telecommunication structures that do not jeopardize the park's mission and resources may be permitted within the park.
 - No new nonconforming use or rights-of-way are permitted through the park without specific statutory authority and approval by the director of the NPS or a representative and only if there is no practicable alternative to such use of NPS lands.
- Actions Outside the Park
 - Resources outside the park are managed in such a way that the park will be safeguarded.
 - The NPS works cooperatively with others to anticipate, avoid, and resolve potential conflicts and address mutual interests.

All alternatives considered for the development of a WTF plan will be developed within the framework of the 2005 Rock Creek Park and the Rock Creek Park and Potomac Parkway Final GMP. This document defines a number of management prescription zones and outlines what activities may occur in each zone.

The general management plan proposes to improve visitor safety, better control traffic volumes and speeds through the park, enhance interpretation and education opportunities, and improve the use of park resources, especially cultural resources through the implementation of their preferred alternative. The plan includes improving traffic management within the park and parkway; retaining the park roadway system and accommodating non-recreational through-traffic; reducing traffic speeds and volumes; upgrading trails; rehabilitating Peirce Mill; relocating the park administrative offices; rehabilitating Linnaean Hill; relocating the U.S. Park Police; converting the Lodge House to a visitor contact station; and rehabilitating the nature center.

Record of Decision for the Rock Creek Park and Rock Creek and Potomac Parkway General Management Plan (2007)

The Record of Decision (ROD) for the Rock Creek Park and Rock Creek and Potomac Parkway GMP outlines the decision on the management actions to be taken in these park units. This document implements the preferred alternative from the GMP. This document states that the park selected alternative A of the GMP for implementation. This alternative was selected, in part, because it recognizes the historic nature of the park's roads as well as the visitors need to access these roads to get to the park, as well as other locations. Alternative A retains the existing park roadway system to accommodate non-recreational through traffic, and incorporates traffic-calming and speed enforcement measures to reduce traffic speeds and volumes to improve visitor safety and better control traffic volumes and speeds throughout the park. This alternative also enhances interpretation and education opportunities and improves the use of park resources, especially cultural resources. Additional aspects of this alternative include trail improvement; rehabilitation of the Peirce Mill complex to better focus on history; the moving of park administrative offices from the Peirce-Klingbein Mansion at Linnean Hill which will be rehabilitated for adaptive use compatible with park values; the relocation of the U.S. Park Police substation from the Lodge House on Beach Drive and the conversion of the Lodge House into a visitor contact station; and rehabilitation of the nature center to expand the building and upgrade the planetarium.

Strategic Plan for Rock Creek Park (2006)

The Strategic Plan for Rock Creek Park contains a mission statement, mission goals, and long-term goals – generally five years in length – as well as information on how the long-term goals will be accomplished. The Strategic Plan was first submitted on September 30, 1997 and revised January 15, 2000. The Strategic Plan was updated in October 2006 and will be effective until September 2011. This plan complements and tiers to the NPS Strategic Plan and displays how Rock Creek Park addresses service-wide mission and goals as well as the specific mission and long-term goals of the park.

Fort Circle Parks Management Plan / Environmental Assessment (2004)

The Fort Circle Parks Management Plan provides a unifying management concept for significant historic resources associated with the Civil War defenses of Washington that would allow these resources to be preserved for future generations, and interpreted in a coherent, easily understandable manner. This plan sets forth a series of desired visitor experience and resource condition statements to guide the management of these units for the next 10 to 15 years.

Resources Management Plan Rock Creek Park (1996)

The Resources Management Plan for Rock Creek Park provides specific management objectives for Rock Creek Park based on the park's Statement for Management. Resource related management objectives, as determined by the Resources Management Plan, include that the park:

- Work cooperatively with other federal agencies, agencies in Maryland and the District of Columbia, private organizations, and members of the public in developing programs to reduce flooding and pollution in the Rock Creek watershed, to prevent or repair damage to park resources caused by human activities.
- Improve the quality of the visitor's experience by reducing excessive automobile (commuter) traffic on roads within Rock Creek Park and better protect the natural resources.

- Seek information, through research or other means, on the natural processes of the park's natural areas in order to perpetuate park resources and to enhance opportunities for resource-compatible public use and enjoyment.
- Preserve and perpetuate the park's plant and wildlife resources in as natural a condition as possible, and to reduce the adverse effects of human activities and non-native species on the natural environment.
- Identify, protect, and perpetuate the park's historic resources, including its mills, Civil War fortifications, and archeological sites.
- Monitor and evaluate current recreational uses of the park lands and redirect these activities in order to reduce adverse impacts.
- Foster understanding and appreciation of the park's natural and cultural values through interpretive and educational programs focusing on Rock Creek's biological, geological, historic, and prehistoric resources.
- Provide for public use and enjoyment of the park through the provisions of varied facilities, services, and programs that are compatible with perpetuating the park's natural and cultural values.
- Establish contact and cooperation with citizens' associations, governmental agencies, and other groups or individuals that surround and have direct effects on or interests in the welfare of the park.

The Resources Management Plan is a strategic planning document and a key element in good management and resource preservation. These management objectives are addressed in a series of project statements which consider natural and cultural resource problems, activities, or issues.

Rock Creek Park Telecommunications Facilities Environmental Assessment (2003)

As described under the "Purpose of and Need for Action" and "Background" sections above, in 2003 the park completed an EA that evaluated the potential impacts of the two existing WTF in the park. The preferred alternative of the EA allowed for the continued operation and maintenance of the two WTF at the maintenance yard and the tennis center, respectively, as currently permitted, but required the NPS to develop and adopt a WTF plan to assist the park in future decision-making regarding potential WTF permit applications and to seek funds to develop and adopt a program to monitor the impact of the existing WTF on migratory birds. These two actions were taken into account in the development of this WTF plan/EA.

The Effect of Cell Towers on Birds and Bats at Rock Creek Park, Washington, D.C. (2007)

As part of the preferred alternative in the 2003 *Rock Creek Park Telecommunications Environmental Assessment*, the park was to seek funds to develop and adopt a program to monitor the impact of the existing WTF on migratory birds. As further discussed in "Affected Environment" and "Environmental Consequences" chapters of this WTF plan/EA, the park is in the second year of a three year study that is one of the first studies to look at the impact of unlit, unguyed "short towers" and their potential impacts on avian species. As part of this study, the park is conducting a spring, summer and fall assessment, each year for three years using both ground and net sampling to look for evidence of bird strikes at the existing facilities. The results of this study were used in developing and analyzing the alternatives for this WTF plan/EA and will be considered when evaluating future WTF applications.

Historic Resource Study: Rock Creek Park, District of Columbia (1990)

The Historic Resource Study for Rock Creek Park, published by NPS in 1990, surveyed, identified, and evaluated Rock Creek Park's above-ground historic cultural resources in order to provide the documentation necessary to document the registration of eligible sites and structures in the National Register centering around the park's centennial celebration. The properties identified in this study as possessing architectural or historic significance that would contribute to a proposed Rock Creek Park Historic District would be considered during the development of a WTF plan/EA (Bushong 1990).

Cultural Landscape Report for Meridian Hill Park (2001)

The Meridian Hill Park Cultural Landscape Report traces the design and construction history of this park unit and reports on the existing conditions of plantings and structures. The report describes the alternatives possible for treatment of Meridian Hill Park. Only preservation and restoration, as defined in The Secretary for the Interior's Standards for the Treatment of Historic Preservation are identified as appropriate.

Cultural Landscape Report: Dumbarton Oaks, Rock Creek Park (2000)

The Dumbarton Oaks cultural landscape report documents the history and existing conditions of this park unit as well as analyzes and evaluates the landscape resources. The need to document the Dumbarton Oaks Park historic landscape became apparent in 1985 when the NPS recognized that the garden was being managed as a natural, rather than a cultural, resource. The landscape report was created to provide guidance for stabilizing existing resources such as focal paths and waterway features. This effort led to the 1997 Preservation Maintenance Plan for Dumbarton Oaks Park, which details how the cultural landscape will be maintained.

Montrose Park Cultural Landscape Report (2004)

The Montrose Park Cultural Landscape Report proposes that the period of significance for the site should be established from 1911 to 1919 and presents treatment alternatives to retain the site's high degree of cultural integrity. The plan recommends preserving and maintaining all existing historic features, reestablishing several missing historic elements, retaining some existing non-historic features, and removing the non-original second tennis court at the Rope Walk.

Rock Creek Plans, Policies, and Actions

Actions related to WTF that could be sited in the park include any pending applications for location or co-location of WTF within the park. Although no formal applications for additional WTF in Rock Creek Park are pending at this time, interest in co-locating at the existing maintenance yard facility was expressed by some licensed providers, and Crown Castle International, a wireless facility operator, expressed an interest in establishing microcell technology in the park.

In addition to the above plans (see above section "Rock Creek Park Planning Documents"), numerous resource management activities for Rock Creek Park units are currently ongoing or planned. Current activities include the development of a non-native plant management plan and other individual resource studies. One of these resource studies includes a 4-year program for the identification and evaluation of archeological resources within Rock Creek Park. The park is currently in the final year of a 4-year parkwide archeological survey to identify and understand cultural patterns in land use and the changing character of the park landscape over time. More specifically, the survey will provide information necessary to manage the park's historic resources effectively and develop information and material to

interpret the history and prehistory of the park. Future resource studies within the park also include the development of a white-tailed deer management plan/EIS, which is currently underway.

There are currently six actions (and accompanying EAs) that are underway or recently completed for proposed projects within the park that would be taken into consideration in the development of a WTF plan. These projects include the EA for the construction of the Metropolitan Branch Trail in the vicinity of Fort Totten, the EA for the rehabilitation of Rock Creek and Potomac Parkway from Thompson's Boathouse to P Street (March 2005), the EA for the rehabilitation of Rock Creek and Potomac Parkway from P Street to Calvert Street (February 2006), an EA for the Fire Management Plan, the EA for Dumbarton Oaks Park stormwater pond project, and an EA for an entrance trail on Blagden Avenue into Rock Creek Park.

The U.S. Park Police West District is comprised of two stations, one of which is the Rock Creek Station in Rock Creek Park (D-3). The D-3 Station personnel patrol 1,800 acres of Rock Creek Park and adjacent parks such as Meridian Hill, Glover Archibold, Fort Totten (and other Civil War defenses), portions of the C&O Canal and the newly acquired Capitol Crescent Trail located along a portion of the Potomac River. This station does not provide adequate space for operational needs, resulting in the need for a new station. This station may be located outside the park or inside the park at an area known as H3. At present, this project has been identified in the GMP, but no funding exists to accommodate the relocation of the U.S. Park Police D-3 facility.

Numerous rehabilitation projects have recently been completed at Rock Creek Park including the replacement of the Nature Center roof and stonework at the Klinge mansion. On-going rehabilitation efforts are occurring at Peirce Mill that aim to restore the site to its previous working order. Road rehabilitation planned for the park includes the repaving of Rock Creek and Potomac Parkway from Thompson's Boat House to Calvert Street (the first phase scheduled to start in spring 2007) and Beach Drive. These rehabilitation efforts will be taken into account when developing a WTF plan.

In January 1997, Rock Creek Park issued a Record of Decision for the Rock Creek Park Tennis Center EIS, which examined impacts related to the activities at the tennis center and surrounding fields so those impacts could be considered in making a decision regarding future management of the facility. The preferred alternative would allow for one professional tennis tournament to be held annually at the tennis center, with the possibility of a second tournament if approved by NPS. Amateur and league tennis and public court use and instruction would continue. Second, the NPS will retain management authority to consider allowing parking on the grass recreational field south of Morrow Drive (the south field) on a trial basis in varying configurations, provided that weather and field conditions permit, and provided that recreational opportunities on the field remain and can be satisfactorily segregated. Management measures at the tennis center, where a telecommunication facility currently exists, will be taken into consideration during the development of a WTF plan to ensure that siting of facilities does not interfere with the planned uses of the area, as detailed in the EIS.

Carter Barron Amphitheatre, opened in 1950, is located in Rock Creek Park. The amphitheater season extends May through September and shares parking with the tennis center. This area is very active during the summer months. In the early 1990s, the NPS renovated the public restrooms, repaired the roofs, and did some electrical upgrades in the backstage area. A major renovation project was completed in 2004. Future renovation activities will be taken into consideration during the development of a WTF plan/EA.

Ongoing activities within Rock Creek Park that should be considered during the development of a WTF plan include hazard tree removal, routine maintenance along roads and picnic grounds, and trail maintenance (maintained by the maintenance division and the all-volunteer Potomac Appalachian Trail

Club). Special events at the park, such as the annual Legg Mason tennis tournament and weekly summer events at Carter Barron, will also be considered.

During development of a WTF plan, the park will continue to receive applications for rights-of-ways and other inquiries regarding telecommunication facilities. Many of these requests are for utilities that already cross the park and the permits are used to access the existing infrastructure.

Pursuant to the NPS Information Resources Management Bulletin 1998-001, all NPS radio systems are required to transition current analog wideband land mobile systems to digital narrowband technology. Transition was completed by January 1, 2005 for very high frequency systems and January 1, 2008 for ultra high frequency systems. Due to the closely related nature of this project and the WTF plan/EA, these activities should be closely coordinated and the potential for cumulative impacts evaluated in case additional structures are needed for the radio conversion.

The development of the Georgetown Waterfront Park will be taken into consideration during the development of a WTF plan. The 10-acre park will link area park systems and will be managed by Rock Creek Park, with the lands adjacent to the park being managed by the C&O Canal National Historic Park (A. Applewhaite-Coleman, NPS, pers. comm., L. Gutman, The Louis Berger Group Inc., Nov. 15, 2007). The creation of this park began when a group of private citizens formed the Georgetown Waterfront Commission and a public-private partnership was created with the NPS and the National Park Foundation. This project also will create an enhanced pedestrian promenade from Georgetown to the Kennedy Center along the Potomac River, complementing the current major renovation underway at the performing arts center. Other components of the project include continuing the promenade and cycling trails from Washington Harbor to Key Bridge. Another component of the Georgetown Waterfront Park could include activities at Thompson's Boat House, an NPS concessioner. The groundbreaking for this project occurred in fall 2006 with completion expected in spring 2008.

Park habitat and wildlife are influenced by a number of outside sources over which the park has little control. Some of these influences that will be taken into consideration during the development the WTF plan/EA including: Lyme disease; feral cats and dogs; vegetative diseases such as hemlock wooly adelgid, emerald ash borer, and dogwood anthracnose; and car and wildlife collisions. West Nile Virus, another external factor, has been identified as a significant factor in avian mortality. Many of the species that carry West Nile are long distance neotropical migrant species that are not only affected by the disease but also contribute to the spread of the virus along their migration routes. Mortality of migrant as well as resident and breeding birds in Rock Creek Park may occur and could have a long-term impact on the avian resources of the park. For these reasons, West Nile Virus would be considered in the development of a WTF plan/EA.

Local/State Plans, Policies, and Actions

In addition to considering future applications for WTF within the park, the WTF plan/EA will look at current and expected applications for WTF within the areas of the District of Columbia surrounding Rock Creek Park units. This information will be used to determine where service gaps exist, which would be an on-going process.

Development of a WTF plan/EA should take into consideration the plans, policies, and actions of District of Columbia agencies. The District Department of Transportation (DDOT) has numerous on-going projects throughout the District that will be considered in plan development. These projects include the Klinge Road Improvement between Porter Street NW and Cortland Place NW. On March 17, 2004, a Notice of Intent to Prepare an EIS was published in the Federal Register and the Draft EIS was released to the public for review and comment in July 2005. Although the current roadway alignment is within a

District-managed right-of-way, NPS lands are located to either side of the right-of-way. Currently, this project is still pending and no decision has been made.

DDOT conducted numerous corridor studies including Military Road, Friendship Heights, and Wisconsin Avenue. These studies resulted in recommendations for transportation improvements that will be considered during plan development. Other transportation projects, as outlined in the DDOT 2005-2010 Capital Improvements Program as well as routine roadway maintenance will be considered in plan development.

Through the Office of Property Management, the District of Columbia manages a program for leasing space for telecommunication facilities on government buildings and properties. These leases are part of the Telecommunications Asset and Location Leverage (TALL) program. In 2004, this program (then administered by the Office of the Chief Technology Officer) had identified over 300 sites available for antenna installations through lease agreements with the city (District of Columbia n.d.). Since then, it was determined that these sites may be technically feasible, but were not practical. Today, the Office of Property Management leases antenna space at seven District of Columbia owned sites. The majority of these leases are to other government entities for safety purposes, with a few to private telecommunications providers in non-residential areas. The Office of Property Management is the central organization for leasing in the District of Columbia. Any management efforts that would consider coordination with the District of Columbia to use city owned structures for WTF would need to go through the Office of Property Management, which would then contact the appropriate agency to arrange the lease agreement. The Office of Property Management is not responsible for antenna leases on private property (e.g., on top of an apartment building), as structures on private property are allowed if they are within the correct zoning (K. Linebaugh, DCOMP, pers. comm., L. Gutman, The Louis Berger Group Inc., June 21, 2007).

On January 6, 2004, the District of Columbia City Council passed a bill that bans motorists from using hand-held cellular telephones while driving. This makes the District of Columbia's distracted-driving laws among the toughest in the nation. This bill went into effect July 1, 2004, and those people violating the law are assessed a \$100 fine. This legislation applies to the roadway system within Rock Creek Park units and should be taken into consideration during the development of a WTF plan/EA.

The District of Columbia is currently in the process of planning and implementing the Metropolitan Branch Trail. The Metropolitan Branch Trail is a proposed 11-mile multi-use trail that runs from Silver Spring in Maryland to Union Station in the District of Columbia. It includes a spur that will connect the trail at Fort Totten to the Anacostia Tributaries Trail System at the District/Prince George's County Border, and a connection to the National Mall. The trail will serve as a transportation route providing direct access to seven of the Washington Area Metro Red Line stations and connecting to the Washington area's trail network at the Capital Crescent Trail and the East Coast Greenway. Part of this trail is proposed to cross NPS-owned land at Fort Totten and along the spur to Prince Georges County; thus plans for the Metropolitan Branch Trail should be considered when developing a WTF plan for NPS units. The park is also partnering with DDOT to design a multi-use trail along Blagden Avenue to Beach Drive, to repair and rehabilitate the multi-use trail along Beach Drive and Rock Creek and Potomac Parkway from Broad Branch Road to Rose Park in Georgetown, and to design and develop a new multi-use trail along the Piney Branch Parkway. As of spring 2007, the project had an approved concept plan, but the EA was still underway.

Viewsheds in the park are impacted not only by structures on NPS lands, such as WTF, but development that occurs adjacent to NPS lands. Tregaron Estates, adjacent to Reservation 356, has been proposed for subdivision development. Tregaron Partnership Limited proposed a planned unit development for the site on the 20-acre wooded parcel between Macomb Street and Klinge Road, west of Connecticut Avenue.

The Washington International School owns 6 acres of the Tregaron estate and leases the remaining 14 acres. Developers have proposed building 18 homes on this land, including underground garages and a new road. At the same time, the Washington International School also has a proposal for some additional building on its portion of the Tregaron Estate. Since this original proposal, Friends of Tregaron, a nonprofit organization opposing the development, has worked with the developer, the Washington International School, and other interested parties to create a new plan that would reduce the amount of development at the site. Subject to approval by the Historic Preservation Review Board, eight houses will be built on the periphery of the estate. Tregaron Limited Partnership, will donate 13 acres to a conservancy to be managed by Friends of Tregaron Foundation, with the developer, Friends of Tregaron (now the Tregaron Conservancy), and the Washington International School contributing funds for ground maintenance, and habitat restoration and rehabilitation (Cleveland Park Citizens Association n.d.; Wiener 2006). At the January 26, 2006 meeting of the District of Columbia Historic Preservation Review Board, a portion of the plan was approved and the remaining portion of the plan was approved in November 2006.

ALTERNATIVES

NEPA requires that federal agencies develop a range of reasonable alternatives and provide an analysis of what impacts the alternatives could have on the human environment. The alternatives under consideration must include a “no-action” alternative as prescribed by 40 CFR Part 1502.14. The no-action alternative in this WTF plan/EA is the continuation of current management for reviewing and decision-making of applications for WTF in the park. The no-action alternative assumes that the NPS would not make major changes to current management. Current management includes implementation of the park’s GMP and associated Record of Decision (ROD) (NPS 2007e) that contain information not previously available to the park regarding the desired condition of park resources and the necessary level of protection to reach these desired conditions.

The two action alternatives presented in this chapter were derived from the recommendations of an interdisciplinary planning team and feedback from the public during the public scoping process. All three alternatives reflect consideration of applicable authorities (see “Chapter 1: Purpose of and Need for Action”). Alternatives development also relied on existing management documents for individual Rock Creek Park units, to ensure that the actions provided under each alternative would not impact the ability of the unit to meet its purpose or mission, or interfere with planned land uses (see chapter 1 for a list and description of the applicable planning documents). The guidance documents considered for each park unit are identified for all alternatives.

While the alternatives for the WTF plan/EA cover all 99 administered units of the park, the alternatives focus on the largest unit of Rock Creek Park (Reservation 339) and the Rock Creek and Potomac Parkway (see figure 6). The 2007 Wireless Telecommunications Report, which identified areas in all Rock Creek Park units that currently lack wireless telecommunications coverage, found that adequate coverage exists in all of the other park units from existing facilities, resulting in the assumption that the demand for new facilities would be primarily directed to Reservation 339 and the Rock Creek and Potomac Parkway (Cityscapes Consulting 2007). However, each of the following alternatives provides a framework for managing WTF within all units of Rock Creek Park.

ELEMENTS COMMON TO ALL ALTERNATIVES

Under all alternatives evaluated, all applications would be subject to compliance with the applicable authorities outlined in chapter 1. Applications for WTF in the park would be considered in the context of these authorities, and would follow the process for evaluating applications detailed in RM-53. Figure 7 outlines the process WTF applicants would be required to follow under RM-53.

The first step in RM-53 states that a park must give an applicant a “yes,” “maybe,” or “no” decision regarding their application within 10 days of receiving a complete application. The schedule for the entire permit review process is based on business days and assumes that the permit application is complete, the information is received in sufficient time to move forward to the next phase, and all steps are completed satisfactorily. If this is not the case, the step must be repeated, and the clock resets to the beginning of the current step or to a timeframe suitable to accomplish the work needed.

If the answer to the first step is “yes” or “maybe,” the following steps are initiated by the park, as shown in figure 7:

- Notice of the application is mailed to the park’s list of potentially interested parties advising them of the receipt of an application. Notification may also be accomplished by posting a notice of receipt of application for a WTF in a newspaper of general circulation in the area affected. This action serves to notify other FCC licensed providers who may have similar interests of the action, and is not a solicitation for comments.

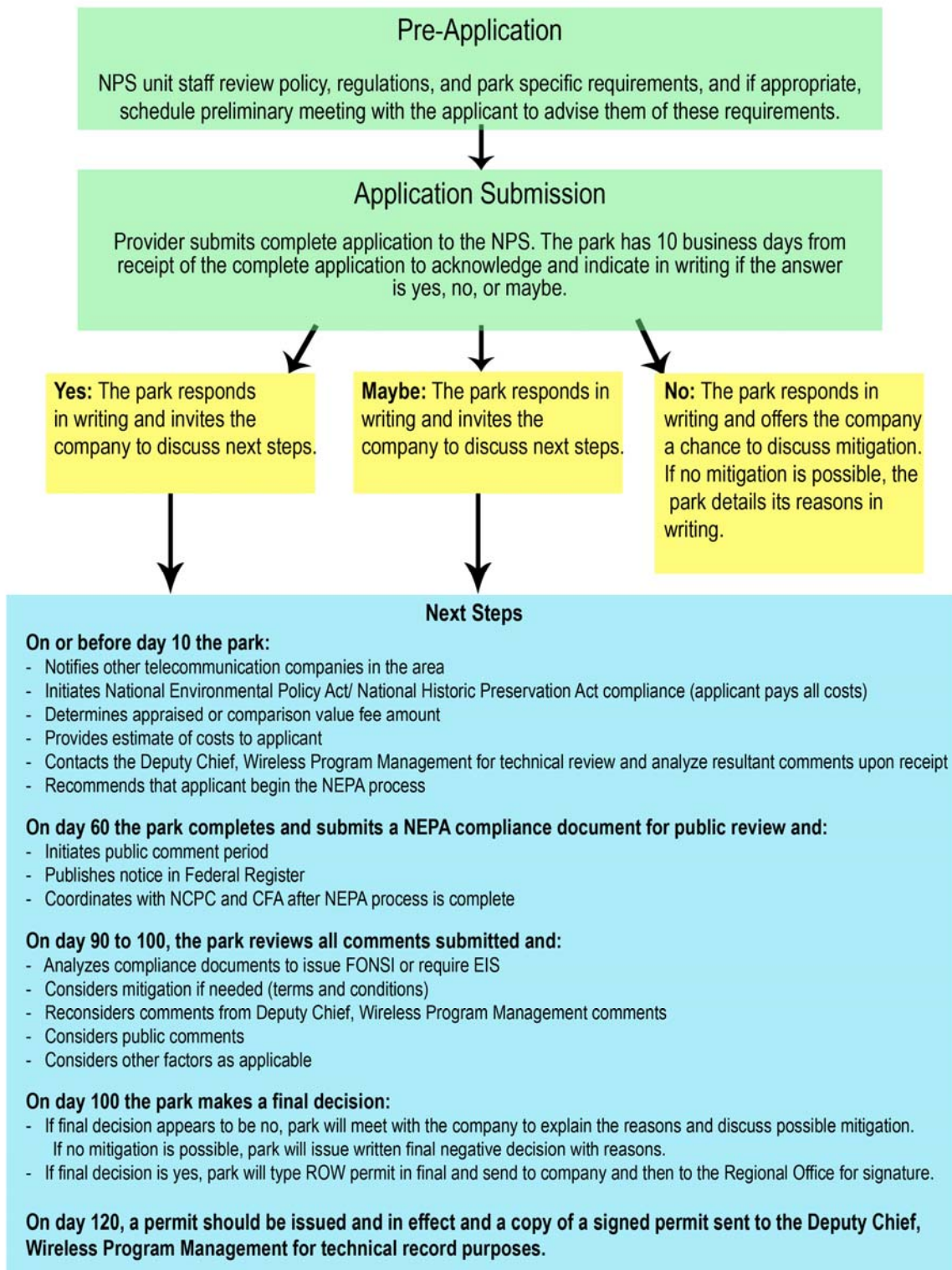
ALTERNATIVES

- The NEPA and NHPA processes are initiated. The compliance documents can be produced at the park, or the park can send a written request to the applicant to complete this, and any other required compliance. All costs related to compliance are the responsibility of the applicant. Although the applicant can complete the compliance documentation, the park is the approving official and has final sign-off authority for all compliance documents. RM-53 states that compliance documents must be completed within 60 days of receiving a complete application. While the NPS strives to meet the prescribed schedule, it is noted that certain levels of compliance may take longer than stated in RM-53.
- The park initiates actions required to determine the fair market fee for using the NPS land or facility requested in the application, unless the fee has already been determined, by use of an appraisal or by considering similar fees in the surrounding area.
- The park sends a copy of the application and all associated materials (radiofrequency coverage diagrams, site location maps, etc.) to the Deputy Chief, Wireless Program Management for the NPS, to review and determine if the proposed use would conflict with current and planned communications facilities and technologies in the area.
- After 60 days, the compliance documents are complete and the park would simultaneously initiate a 30-day public comment period with public notification through the newspaper and Federal Register. Around day 90 of the application process, public comment on the compliance document would be received and the park would consider these comments and reconsider the comments from the Deputy Chief, Wireless Program Management, in light of any additional information that may have been received during the comment period.

On or before day 100 of the application process, the park makes a final decision (see figure 7).

The above process would apply to applications for new WTF and for requests for co-location on the two existing WTF at the tennis center and the maintenance yard. As detailed in the NPS Management Policies 2006, co-location on the existing facilities would be encouraged before the establishment of new WTF. The management actions detailed in the park's GMP and other management documents would also be considered during the application process. General steps for future applicants would include submitting preliminary construction information, as required by RM-53.

FIGURE 7: NPS PROCESS FOR CONSIDERING WIRELESS TELECOMMUNICATION FACILITIES APPLICATIONS UNDER REFERENCE MANUAL 53



ALTERNATIVES

Before a right-of-way permit is granted under all alternatives, the applicant would have completed the NEPA process, and NHPA compliance, worked with the park, and decided on terms and conditions for the permit, and the application would have been submitted by the NPS to the NCPC and the CFA, if applicable, for their review. Both of these processes are open public processes, with the public invited to attend commission meetings in most instances.

For coordination with the NCPC, the NPS, as the federal agency involved, is responsible for submitting the request for review on behalf of the applicant. The following process details how NPS coordinates with NCPC for WTF applications:

- Pre-application meeting: Typically, the NPS would meet with a NCPC staff member before the application is submitted for review to discuss the proposal and the process.
- Submission of application: After the pre-application meeting, the park would submit the application to the NCPC for review. This application would detail the request for a right-of-way permit on NPS lands and would contain the terms and conditions that the applicant must follow and that NPS agreed to.
- Application Evaluation: NCPC would review the application submitted by the NPS on behalf of the WTF applicant, in accordance with NCPC's Guidelines and Submission Requirements for Antennas on Federal Property in the National Capital Region (NCPC 2001) detailed on page 38.
 - If NCPC approves the application submitted by the NPS, Rock Creek Park would then continue its review process with the applicant and approve the application and issue the right-of-way permit, containing all applicable terms and conditions for the applicant to follow.
 - If NCPC denies the application, the application process could end at that point, or the NPS could go back to the applicant to discuss the reasons NCPC denied the request and develop new terms and conditions. If new terms and conditions are developed, NPS would resubmit the application to NCPC and the review process would start again. If resubmission of the application were to occur, the NPS would continue to consult with the NCPC for review of the modified proposal to address all concerns associated with the application (K. Anderson, NPS, pers. comm., L. Gutman, The Louis Berger Group, Aug. 2, 2007).

In addition to review by NCPC, projects occurring in the park would be subject to review by the CFA under the *Shipstead-Luce Act*, or under the *Old Georgetown Act* for those projects occurring in units in the Georgetown area. Applicants under this process must submit photographs of the property in question with views from the street, along with contextual photos with adjacent structures identified. This information is used with construction drawings such as a site plan, to determine if the proposed project, in this case a WTF, would impact the National Capital. As with NCPC, the applicant must get approval from the CFA before the park would further consider a WTF application.

Only after these federal commissions have signed off on the right-of-way permit application can Rock Creek Park work with the applicant to further process the permit request.

In addition to following these regulatory requirements, the following elements would be common to all alternatives, including the no-action alternative. These elements are in addition to all applicable authorities, which provide that WTF are not to conflict with the agency's mission or planned use of the property and that consideration be given to environmental and historic preservation issues.

- Co-location on the two existing monopoles would be considered as detailed in the existing permits. These permits state that: "The Permittee will allow any future wireless telecommunications provider approved by the NPS to co-locate on the Permittee's antenna monopoles so long as such co-location does not interfere with the Permittee's existing use of the

Property.” The permit requires those wishing to co-locate to submit an application with the NPS and complete the application process outlined in RM-53, including completion of the NEPA and NHPA processes to ensure no unacceptable impacts to park resources would occur.

- The term “coverage” refers to the desired level of service in an area that provides what is termed as “in-car” coverage. This level of coverage means that someone driving in their car could receive a usable signal. Other levels of coverage include “on-street,” or getting signal outside of a car or building, and “in-building,” being able to receive a signal inside buildings. Although an area may currently have coverage for pedestrians, if it does not provide in-car coverage, it is considered to have a coverage gap. Under this level, users on foot and in a car would have service, but those in buildings may not.
- The use of the term “infrastructure” refers to the utilities required to support a WTF. In the case of WTF, infrastructure would include buried electric lines to provide power to the facility and buried fiberoptic cable to provide the wireless service. All associated cables for WTF (electrical, telephone, and fiber optic) must be buried and cannot be above ground.
- The use of the term “associated structures” refers to the support structure that holds the antenna, the equipment building and its contents, and any other structure required for the operation of the WTF.
- No fencing would be permitted around WTF and their associated structures in order to minimize impacts to the cultural landscapes and historic districts located throughout Rock Creek Park units. Part of the legislative purpose of Rock Creek Park is to “preserve and perpetuate for this and future generations the ecological resources of the Rock Creek valley within the park in as natural a condition as possible, the archeological and historic resources in the park, and the scenic beauty of the park.” Because an integral part of the park’s mission is related to the aesthetic value and scenic beauty of the park, allowing fencing around WTF would be contrary to the park’s mission.
- Applications must include an analysis of locations outside the park that could provide similar levels of service.
- Permits would be granted only for WTF using the newest technology, following the intent of all applicable authorities to facilitate the build out of new WTF service, and conforming to the NPS Management Policies 2006 direction requiring the “best technology available.” Under Section 8.6.4.3, “traditional” towers, such as monopole or lattice structures, should be approved only after all other options have been explored. The management policies further state that consideration should be given first to co-locating new facilities, constructing new towers that are camouflaged to blend with their surroundings, and installing micro-sites.
- WTF would be subject to the USFWS guidance on siting such facilities (see table 2 later in this chapter for a detailed description), and would not be permitted in a breeding bird census area, an area of sensitive habitat, or in a place that would impact historic resources. See figure 10 in “Chapter 3: Affected Environment” for location of the breeding bird area. Applications may be subject to additional requirements based on the ongoing study, “The Effect of Cell Towers on Birds and Bats at Rock Creek Park.” Should the study find impacts related to WTF located in migratory flyways, WTF would no longer be permitted to site in these areas.
- WTF right-of-way permits would not be granted for certain areas of the park because of desired conditions stated in the park’s GMP and other applicable management documents. These areas are identified in each unit’s relevant planning documents (detailed below), and the reasons prohibiting WTF in them, include:
 - **Forest Zone** (managed under the GMP for Rock Creek Park and Potomac Parkway): In accordance with the GMP, no new roads or utilities would be established in these areas,

making them inaccessible for the construction, operation, and maintenance of WTF. Siting of WTF in the Forest Zone could result in loss and fragmentation of forest habitat, adverse impacts to habitat for sensitive species, introduction of non-native species, adverse impacts to visitor use within the forest zone, the potential for adverse impact to archeological resources, and adverse impacts to the trail circulation system, a contributing resource on the National Register nomination. The Forest Zone includes the seeps and springs in Rock Creek Park that are home to sensitive and threatened amphipod species. Any development in this area could be detrimental to these species. See also NPS *Management Policies 2006*, Section 8.6.4.3: "...ensuring that facilities and their supporting infrastructure...are not located in scenic, historic, and/or sensitive areas integral to the park's mission"; Section 4.1: "the NPS will strive to understand, maintain, restore, and protect the inherent integrity of the natural resources, processes, systems and values of the parks while providing meaningful and appropriate opportunities to enjoy them."

- **Park Road Zone** (managed under the GMP for Rock Creek Park and Potomac Parkway): The Park Road Zone includes all paved roads, other than Beach Drive and the Rock Creek and Potomac Parkway, that are owned and maintained by the NPS and are open to automobile use by the public. The zone is a narrow corridor that includes the road surface, shoulders, and associated pullouts, parking areas, and paved trails. These corridors provide scenic driving, as well as pedestrian and bicyclist access, to park recreational and interpretive facilities. These roads run through the Forest Zone, and many have been identified as cultural resources. The GMP states that all roads, recreational trails, and associated facilities are managed to complement the natural setting and historic road design. Because these roads are directly adjacent to areas designated as Forest Zone and are required to be managed to retain their cultural resource importance under the GMP, WTF would not be permitted in this zone for the same reasons as detailed for the Forest Zone.
- **Fort Circle Parks** (managed under the Fort Circle Parks General Management Plan): Facilities may be sited in the park areas that connect the fort sites under all alternatives; however, if these areas can be seen from the forts, the applicant must show that the facilities would not have a negative impact on the historic property. No facilities are to be placed within the fort sites. The forts are listed on the National Register and placement of facilities at these sites would be contradictory to NPS Management Policies 2006 and the NHPA. The Fort Circle Parks were established to conserve the linkage of urban green spaces that contribute to the character and scenic values of the Nation's Capital. Placement of WTF in these units would impact the character and scenic value that these parks were established to protect. Although WTF could be sited in some units of Rock Creek Park with cultural resources under all alternatives, the size and location of the Fort Circle Parks would make any facility difficult to conceal, resulting in a greater potential for impacts to these protected resources in these parks than other Rock Creek Park units. Further, the Fort Circle Parks GMP sets out desired visitor experiences at these sites, which influence future land uses. These desired experiences include: interacting with cultural and natural resources in ways that do not damage or derogate those resources and provide safe, satisfying experiences; learning about or simply enjoying the diversity of the sites' natural resources; and appreciating the vulnerability of the sites' natural and cultural resources to human activities inside and outside park boundaries. Consideration of WTF at the fort sites would therefore also be in conflict with these planned uses of the land.

- **Dumbarton Oaks** (site uses determined by the Cultural Landscape Report: Dumbarton Oaks): Dumbarton Oaks is listed on the National Register; therefore, siting WTF within Dumbarton Oaks would be contrary to NPS *Management Policies 2006* and the NHPA, which call for the protection of cultural resources. In accordance with Section 8.4.6.3 of the NPS *Management Policies 2006*, WTF should not be sited in scenic, historic, and/or sensitive areas integral to the park’s mission. Areas that are listed on the National Register are considered to be scenic, historic, and sensitive. Management of this park unit is guided by the Cultural Landscape Report: Dumbarton Oaks (NPS 2000). This report states that the landscape of Dumbarton Oaks retains a high degree of integrity. This park unit consists of only 27 acres, and the placement of any non-contributing structure, such as a WTF, would have adverse impacts. In such a small area, such a facility could not be concealed to address any potential impact and would, in effect, alter the historic character of the site. Placement of WTF at Dumbarton Oaks would alter the characteristics of this landscape and the features that make it eligible for listing on the National Register. Since these aspects of the unit would be impacted, presenting an unavoidable conflict with the parks mission and planned uses, applications for WTF would not be granted in this Rock Creek Park unit.
- **Montrose Park** (site uses determined by the Cultural Landscape Report: Montrose Park): Montrose park is listed on the National Register; therefore siting WTF within Montrose Park would be contrary to NPS *Management Policies 2006*, which calls for the protection of cultural resources, and the NHPA. Uses in this Rock Creek Park unit are guided by the Montrose Park Cultural Landscape Report (NPS 2004e). This report calls for the preservation and maintenance of all existing historic features, reestablishment of several missing historic elements, retention of some existing non-historic features, and removing the non-original second tennis court. A series of actions are suggested that would improve and maintain this historic site. This park area is relatively small compared to the main unit of Rock Creek Park (324 acres compared to 1,822 acres), and any type of non-contributing structure, such as a WTF, would be expected to have a greater impact to the cultural resources at Montrose Park, even when concealed. Montrose Park is a National Register listed site with a document that guides the future land uses of the park unit. These land uses call for the restoration of historic features, and granting right-of-way permits for WTF in this unit would be considered an unavoidable conflict with the park’s mission and planned land uses of this site.
- Applicants would be required to conform to the physical requirements for WTF facilities, such as height and lighting, directed by applicable authorities (see table 2). A more detailed description of these applicable authorities is provided on pages 26-43. All Federal Communications Commission regulations, as described in the “Affected Environment” chapter would also apply.

TABLE 2: GENERAL PHYSICAL GUIDELINES FOR WIRELESS TELECOMMUNICATION FACILITIES UNDER APPLICABLE AUTHORITIES

Agency with Applicable Authority	Guidelines on Co-location	Guidelines on Technology to be Used	Guidelines on Height of Facilities	Guidelines on Areas Where Facilities are or are not Permitted	Guidelines on Lighting for Facilities and Associated Structures	Guidelines for Types of Tower Facilities Permitted
NPS Management Policies 2006	Evaluate applications for maximum potential for co-location.	Applicants required to use the best technology available.	No guideline given.	Directs facilities to be located where they would have the least impact on park resources and cannot be located in scenic, historic, and/or sensitive areas integral to the park's mission. Whenever possible and practicable facilities will be located within developed park areas or outside park boundaries.	No guideline given.	Consideration should be given to towers camouflaged to blend in with surroundings, to micro-sites, that new traditional towers- monopole or lattice only be approved after all other options explored and that they not be visible from any significant public vantage point.
NPS RM-53 (implementing Director's Order #53)	Encourage co-location where possible.	No guideline given.	No guideline given.	Right-of-way permits only issued for those requests where there are no practicable alternatives and will not result in a derogation of the resources, values, and purposes for which the park was established.	No guideline given.	Facilities should follow best practices.
USFWS Guidance	Encourage co-location where possible, new facilities should structurally and electrically accommodate the applicant/licensee's antennas and comparable antennas for at least two additional users. Depending on tower load factors, from 6 to 10 providers may co-locate on an existing tower.	No guideline given.	Providers should be strongly encouraged to construct towers no more than 199 feet above ground level.	To the extent possible, new towers should be sited within existing "antenna farms" and should not be sited in or near wetlands, other known bird concentration areas, in known migratory or daily movement flyways, or in habitat of threatened and endangered species.	Facilities under 199 feet should be unlighted (if FAA regulations permit), if a facility over 199 feet requires lights for aviation safety, the minimum should be used, only white or red strobe lights should be used at night – red solid or pulsating red warning lights should be avoided. Security lighting for on-ground facilities and equipment should be down-shielded.	Construction should not use guy wires. If tower designs using guy wires for support are proposed to be located in major migratory routes, daytime visual markers should be installed on the wires to prevent collisions with birds.

TABLE 2: GENERAL PHYSICAL GUIDELINES FOR WIRELESS TELECOMMUNICATION FACILITIES UNDER APPLICABLE AUTHORITIES

Agency with Applicable Authority	Guidelines on Co-location	Guidelines on Technology to be Used	Guidelines on Height of Facilities	Guidelines on Areas Where Facilities are or are not Permitted	Guidelines on Lighting for Facilities and Associated Structures	Guidelines for Types of Tower Facilities Permitted
NCPC	To reduce the number of antennas in the region, and to mitigate potential adverse effects from radiofrequency emissions, co-location possibilities will be evaluated by federal agencies.	Permits reviewed every 5 to 10 years to require facilities to adjust to new technologies.	Antennas and support facilities erected in the District of Columbia shall be consistent with the Heights of Buildings Act of 1910 which restricts building height to 20 feet higher than the width of the adjacent street.	The location of towers, antennas, or similar structures in the federal park system is discouraged, to the extent possible. Federal and local agencies should, to the extent practical, identify appropriate locations for the siting of antennas and towers through their master plans and comprehensive plans.	No signals, lights, or illumination shall be permitted on antennas or support structures unless required by the FCC, FAA, or other federal government agency.	Federal agencies should anticipate the need to screen antennas on buildings in a manner appropriate to the building's design – installations should be designed and installed in a manner that minimizes or eliminates the visibility of the antenna and all support structure from adjacent properties. Design guidelines for structures include use of non-combustible, corrosion resistant or protected materials; materials that are not bright shiny, or reflective; materials that are of a color that blends with the building or landscape, and that they contain no commercial advertising.
GSA Bulletins Guidance	Encourage co-location where there are multiple siting requests for the same location.	No guidance given.	No guidance given.	To the extent possible the government may make available Federal Government buildings and lands for the siting of antennas, taking into consideration environmental, aesthetic, and historic preservation issues, and unless there are unavoidable conflicts with the agency's mission or current planned use of the property or access to that property.	No guidance given.	No guidance given.

ALTERNATIVE A: NO-ACTION ALTERNATIVE

In the no-action alternative, right-of-way permit applications for WTF within any unit of Rock Creek Park would continue to be evaluated by the NPS in accordance with applicable authorities and RM-53, as described in the “Elements Common to All Alternatives” section in this chapter. Requests for WTF siting in all areas of the park would be reviewed in the context of the park’s GMP, or other applicable management document, to determine if WTF siting would be acceptable in the requested area of the park. The park would continue to consider WTF applications without a more structured process or plan for the evaluation of such requests than is currently in place. Current management includes implementation of the park’s GMP and associated ROD (NPS 2007e) that contains information not previously available to the park regarding the desired condition of park resources and the necessary level of protection to reach these desired conditions.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

The no-action alternative is developed for two reasons. It may be a viable choice in the range of reasonable alternatives, and it sets a baseline of existing impacts continued into the future against which to compare the impacts of action alternatives. The two action alternatives, alternatives B and C, when combined with alternative A, provide a complete range of reasonable alternatives. The applicable authorities and the level of detail they provide defined the range of reasonable alternatives for this WTF plan/EA. In addition to the permit application provisions required under RM-53 for all WTF applications, the following provides those management actions common to the two action alternatives:

As part of the permit terms and conditions, all new facilities constructed must be structurally capable of supporting multiple co-locations. Applicants must agree to co-location on any facility permitted, with fees for co-location charged by the WTF owner within fair market values for the surrounding area as a condition of their right-of-way permit.

The construction of a tower (lattice, monopole, guy, or other type) that does not utilize camouflaged or otherwise concealed and use technology of the latest design would not be permitted. Part of the legislative purpose of Rock Creek Park is to “preserve and perpetuate for this and future generations the ecological resources of the Rock Creek valley within the park in as natural a condition as possible, the archeological and historic resources in the park, and the scenic beauty of the park.” Allowing facilities that do not meet these requirements would likely create a direct conflict with the park’s mission.

Access roads or driveways to accommodate WTF placement and maintenance, including access roads that are paved, or made of gravel, sand, or other material, would need to be included and approved as part of the WTF application process and cannot conflict with the planned use of the property or impact the natural and cultural resources integral to the park’s mission.

As WTF technologies change and further develop, the park would re-evaluate what types of facilities are permitted in each zone.

ALTERNATIVE B: ZONE MANAGEMENT

In alternative B, the park would review and evaluate applications for WTF using criteria set out for different zones. The zones and criteria are described in table 3. These zones would be based on the GMP and other planning documents that discuss planned uses of the park unit.

Rock Creek Park recently completed the GMP providing the framework for managing park resources within Reservation 339 and the Rock Creek and Potomac Parkway boundaries. Areas not covered in the GMP are managed by other documents, as indicated in table 3. In accordance with the applicable authorities, federal departments and agencies, such as the NPS, have the authority to deny WTF right-of-way applications if there is unavoidable conflict with the agency mission or with the current or planned use of the property or access to that property and reject inappropriate siting requests and assure adequate

protection of public property. Existing plans, such as the GMP and management documents for other Rock Creek Park units, serve to detail the planned use of the properties, provide the framework for this alternative, and provide a basis for consideration of WTF applications in Rock Creek Park.

This alternative uses the GMP zoning of Reservation 339 and the Rock Creek and Potomac Parkway to determine if, where, and in what capacity, WTF would be permitted within the park in those units. For Reservation 339, the zones are shown in figure 6. In those zones or areas (those Rock Creek Park units not covered under a GMP) where facilities could be sited, this alternative would use the terms and conditions described in table 3 as part of the right-of-way permit to minimize impacts to resources. In addition to the specifications below, physical features regulated by the applicable authorities described in table 2 would also apply. Park units outside of Reservation 339 and the Rock Creek and Potomac Parkway would be considered separate, distinct management zones, each managed by a document other than the GMP. Those zones where WTF would be prohibited are provided with a rationale for the restrictions on such development, i.e., sensitive cultural resources integral to the park's purpose and mission, or the planned land use or both. These planned uses would be based on the GMP, NPS Management Policies 2006, and other applicable regulations such as the ESA, Migratory Bird Treaty Act, and the NHPA. This alternative would take into consideration the requested location and the type of facility proposed. This application process would be conducted in accordance with RM-53, NCPC review, and CFA review, as described under "Elements Common to All Alternatives," but in addition would provide a system listing the zones or units where right-of-way permit applications for WTF could potentially be granted, the type of facility potentially allowed, and criteria by which to consider an application. Although the park currently uses a similar process when evaluating permits for WTF, alternative B would formalize this process and would inform the applicant in advance what terms and conditions would apply (see table 3) and where the park would consider allowing facilities to be sited.

A right-of-way permit application for the development of a WTF site would be required to go through a simple decision-making process (see figure 8), and would require completion of NEPA documentation.

TABLE 3: ZONE MANAGEMENT ALTERNATIVE: ALTERNATIVE B

GMP Zone or Park Unit	Plan Covering Area/unit	Potential issues to be addressed through permit terms and conditions	Reasoning and Regulatory References
Cultural Resource Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Applications for WTF that impact the contributing elements of any cultural resource, including cultural landscapes and historic structures, would not be granted.</p> <p>Complete a viewshed analysis to ensure that cultural landscapes would not be impacted. The viewshed would include anything visible from within the site, as well as areas from outside Rock Creek Park administered unit boundaries from which the park unit can be viewed.</p> <p>Use concealed facilities and other technologies that have no visual impacts to historic structures and cultural landscapes (e.g., locating microcells within lamp poles that conform to the historic design). Facilities would not be permitted to be attached to the inside or outside of a historic structure. Applications for WTF may be granted if they are not attached to the facility and not within view.</p>	<p>Structures in the Cultural Resource Zone are individually listed or listed as contributing resources on the National Register of Historic Places. No WTF would be allowed in this area on structure exteriors, or physically attached to building interiors. Permits may be granted for installation within these buildings if the historic structure is not impacted and if there is no impact, physically or visually, from the associated equipment. Further, management of the cultural resource zone calls for cultural landscapes to be managed to reflect their historic design. Permits for any WTF that would detract from the historic design would not be granted. Permits for any WTF located in areas of known archeological resources would not be granted in order to protect those resources. Any facility that would adversely impact the park's cultural resources would not be permitted. Only those applications with sufficient mitigation to avoid potential impacts would be allowed. One of the park's purposes, as stated in the GMP, is to "preserve and perpetuate for this and future generations the ecological resources of the Rock Creek Valley within the park in as natural a condition as possible, the archeological and historic resources in the park, and the scenic beauty of the park." Any consideration of WTF applications within the Cultural Resource Zone must take this purpose into consideration so that the facility would not be in conflict with the mission of the park.</p> <p>The Secretary of the Interior's Standards for Treatment of Historic Properties Standards for Preservation state that "the historic character of a property will be retained and reserved," that "distinctive materials, features, finishes and construction techniques or examples of craftsmanship that characterize a property will be preserved," and that "archeological resources will be protected and preserved in place." Because attachment to the interior or exterior of a historic structure would alter the historical fabric of that building, a permit for that type of facility would not be granted in any Rock Creek Park administered unit.</p> <p>See also NPS <i>Management Policies 2006</i>, Section 5.3.1 – "The NPS will employ the most effective concepts, techniques, and equipment to protect cultural resources against theft, fire, vandalism, overuse, deterioration, environmental impacts, and other threats without compromising the integrity of the resources." Section 5.3.5.1.1 "Archeological resources will be maintained and preserved in a stable condition to prevent degradation and loss." For this reason, applications for WTF in areas of known archeological resources would not be granted. Section 8.6.4.3, "Superintendents will avoid or minimize potential impacts of current and future telecommunications facilities by ensure that the facilities and their supporting infrastructure... are not located in scenic, historic, and/or sensitive areas integral to the park's mission."</p>

TABLE 3: ZONE MANAGEMENT ALTERNATIVE: ALTERNATIVE B

GMP Zone or Park Unit	Plan Covering Area/unit	Potential issues to be addressed through permit terms and conditions	Reasoning and Regulatory References
Valley Floor Automobile Access Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Use concealed facilities and other technologies that would minimize the visual impacts (e.g., locating microcells within lamp poles that conform to the historic design).</p> <p>Encourage applicants to work with the District of Columbia Office of Property Management to use facilities in this area located along DC right-of-ways that already have existing infrastructure to obtain the desired coverage (i.e., city light poles, bridges, etc).</p> <p>Facilities must be no taller than 30 feet and no wider than 8 inches in diameter or 8 inches squared in order to be of similar dimensions as the existing historic light poles.</p>	<p>The GMP calls for this area to be used for motorized and non-motorized recreation. Included in this area is Beach Drive, an area of high commuter use. Areas adjacent to Beach Drive are maintained by mowing and provide minimal habitat for wildlife. Permits may be granted in forested areas within this zone, as long as they are sited within a predetermined buffer area from the edge of the roadway. This area contains some of the parks sensitive cultural resources, such as the light poles along Beach Drive that are part of the purpose and significance of Rock Creek Park.</p> <p>See NPS <i>Management Policies 2006</i>, Section 8.2.5 – “the park service strives to protect human life and provide for injury free visits” and Section 8.6.4.3 – “consider the potential benefit of having telephone access to emergency law enforcement and public safety services.”</p>
Rock Creek and Potomac Parkway Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Same as the Valley Floor Automobile Access Zone, however, additional terms and conditions would be applicable due to the cultural significance of the parkway.</p> <p>Use concealed facilities and associated infrastructure (i.e., equipment cabinets) that minimize visual impacts, whether free standing or on an existing structure.</p>	<p>This area is a historic parkway that provides a scenic experience, in accordance with the park’s significance. Facilities could be permitted here, for the same reasons provided under the Valley Floor Automobile Access Zone, but would be limited based on the cultural significance of the parkway and the role the parkway plays in the park’s mission. Facilities in this area would have to address the need of the visitor and visitor safety with the cultural significance of the parkway. Facilities would either be prohibited or, if allowed, would need to adhere to strict terms and conditions to minimize impacts to cultural resources and visitor experience.</p> <p>See also Rock Creek Park Significance – “The Rock Creek and Potomac Parkway provides a scenic gateway to the city’s monumental core” and “Rock Creek Park is a historic designed landscape incorporating early 20th century picturesque and rustic features designed to enhance the visitors’ experience of the naturalistic park scenery.”</p> <p>See NPS <i>Management Policies 2006</i>, Section 8.2.5 – “the park service strives to protect human life and provide for injury free visits” and Section 8.6.4.3 – “consider the potential benefit of having telephone access to emergency law enforcement and public safety services.”</p> <p>Regulatory references related to the cultural significance of the Parkway would be the same as those under the Cultural Resource Zone.</p>

TABLE 3: ZONE MANAGEMENT ALTERNATIVE: ALTERNATIVE B

GMP Zone or Park Unit	Plan Covering Area/unit	Potential issues to be addressed through permit terms and conditions	Reasoning and Regulatory References
Visitor Facility Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Locate facilities within the existing development footprint where infrastructure to support them exists. Maintenance activities for the facilities would not interfere with visitor use.</p> <p>Only concealed facilities or use of technology that reduces the facility height in order not to interfere with visitor use and experience.</p> <p>Associated structures, such as equipment cabinets must be concealed in order not to interfere with visitor use and experience.</p>	<p>The GMP designates this zone as an area with facilities for information, interpretation, education and other visitor services. This zone includes facilities and waysides to support information and interpretive activities. Applications for WTF may be granted in this area if they are not placed outside the existing development footprint and the facilities would not impact the visitor experience. Height restrictions would also be in effect in this zone. Any WTF cannot be in conflict with the planned uses of this zone.</p> <p>See NPS <i>Management Policies 2006</i>, Section 8.2, "The Service is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and the Service will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of American society."</p> <p>See NPS <i>Management Policies 2006</i>, Section 8.2.2, "Sounds that visitors encounter affect their recreational and/or educational experience...the service will take action to prevent or minimize those noises that adversely affect the visitor experience or that exceed levels that are acceptable to or appropriate for park visitors."</p> <p>See NPS <i>Management Policies 2006</i>, Section 8.6.4.3, "As with other special park uses, telecommunication proposals must meet the criteria listed in Sections 1.4.7.1 and 8.2 to prevent unacceptable impacts" (see these sections above).</p>
Administration/ Operations Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Locate facilities within the existing development footprint, where infrastructure to support them exists.</p> <p>Prohibit facilities that interfere with park operations.</p> <p>Conceal equipment cabinets. Placement of these facilities cannot interfere with visitor use of the area.</p>	<p>This zone contains structures and grounds used for park administration and operations. This area could be appropriate for facilities if they are not placed outside the existing development footprint and the facilities would not impact park and U.S. Park Police operations. Height restrictions would be used in this zone and impacts to cultural resources (historic structures and viewsheds) would not be permitted.</p> <p>See NPS <i>Management Policies 2006</i>, Section 1.9.1.4 – In making decisions on matters concerning employee safety and health, NPS managers must exercise good judgment and discretion and, above all, keep in mind that the safeguarding of human life must not be compromised."</p> <p>See NPS <i>Management Policies 2006</i>, Section 9.4.5 – "...communications towers...will be located and designed to minimize their impact on resources and their intrusion on the visitor experience. Whenever possible and practical, such installations will be located within developed park areas or outside park boundaries."</p>

TABLE 3: ZONE MANAGEMENT ALTERNATIVE: ALTERNATIVE B

GMP Zone or Park Unit	Plan Covering Area/unit	Potential issues to be addressed through permit terms and conditions	Reasoning and Regulatory References
Urban Recreation Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Permit facilities only in areas where infrastructure already exists. No trenching for utilities and other facility support would occur in forested areas, but may be appropriate in areas that are already developed/disturbed.</p> <p>Prohibit facilities in or around the community gardens within the Urban Recreation Zone.</p> <p>Consider facilities in the area of the tennis center. Encourage co-location on the existing structure and on existing light poles (or concealed structures that look like the existing light poles).</p> <p>Conceal equipment cabinets as to not interfere with the visitor experience.</p> <p>Consider concealed facilities in other recreation areas, such as the golf course, which blend with the built and natural environment. Consider concealed facilities, including equipment cabinets, which do not impact historic structures.</p>	<p>This zone includes recreation facilities such as picnic areas, community gardens, stables, sport fields, and the golf course. No facilities would be permitted within the community gardens as they are considered a significant cultural resource. In all other Urban Recreation areas, permit terms and conditions would be required to avoid conflicts with visitor use, impacts to soundscapes, or park operations.</p> <p>NPS management policies that would apply to the Urban Recreation Zone are the same as those in the Visitor Facility Zone.</p>
Urban Transit Zone	Rock Creek Park and Rock Creek and Potomac Parkway GMP	<p>Terms and conditions for this zone would be the same as the Valley Floor Automobile Access Zone.</p>	<p>This area includes non-NPS roads within the park and parkway boundaries that provide access across the park and connections with the urban street grid. Facilities may be limited by type (i.e., no monopoles), use of existing light poles, height, or design. Reasons why facilities would be permitted are the same as Valley Floor Automobile Access Zone.</p>

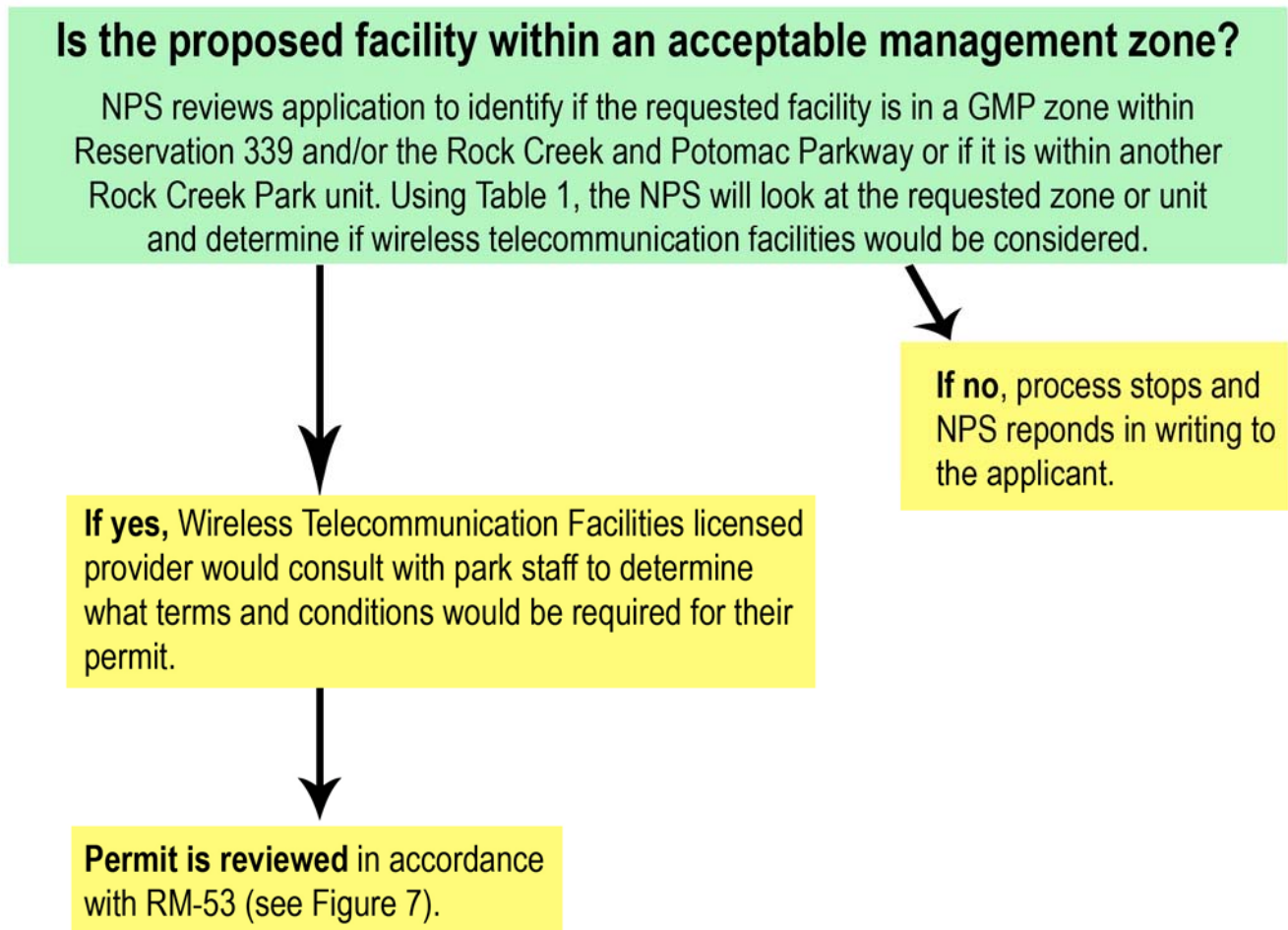
TABLE 3: ZONE MANAGEMENT ALTERNATIVE: ALTERNATIVE B

GMP Zone or Park Unit	Plan Covering Area/unit	Potential issues to be addressed through permit terms and conditions	Reasoning and Regulatory References
Other Rock Creek Park Units			
Whitehaven Parkway	Park uses managed by the enabling legislation	<p>Facilities must use existing infrastructure.</p> <p>Use concealed facilities and other technology that have no visual impacts to historic structures and cultural landscapes (e.g., locating microcells within lamp poles that conform to the historic design).</p> <p>Conceal all equipment cabinets to minimize impacts to the cultural landscape.</p>	Permits for WTF may be granted in areas of the unit that would not impact the cultural landscape of the unit. Any permitted facility would be subject to permit terms and conditions to avoid impacts to natural and cultural resources. Reasoning and regulatory references for White Haven are the same as those for the Cultural Resource Zone.
Glover-Archbold Park	Park uses managed by the enabling legislation	Terms and conditions at Glover-Archbold would be the same as those at White Haven as both have similar cultural landscape concerns.	Facilities may be granted in areas of the unit that would not impact the cultural landscape of the unit. Any permitted facility would be subject to permit terms and conditions to avoid impacts to natural and cultural resources. Reasoning and regulatory references for Glover-Archbold Park are the same as those for the Cultural Resource Zone.
Tennis Center Complex	EIS for the Tennis Stadium (NPS 1993); Rock Creek Park Telecommunications Facilities EA (NPS 2003c)	<p>Locate facilities within the existing development footprint, where there is existing infrastructure. The existing development footprint includes areas that have already been disturbed by development such as parking lots and other paved areas. Areas outside the development footprint would be grass and forested areas.</p> <p>Use concealed facilities and other technology that have no visual impacts to historic structures and cultural landscapes, such as the Carter Barron Amphitheater or any of the park's cultural landscapes that can be viewed from this area (e.g., locating microcells within lamp poles that conform to the historic design).</p> <p>Conceal all equipment cabinets to minimize impacts to the cultural landscape.</p> <p>Prohibit facilities that interfere with visitor use and planned events at the Tennis Center.</p>	The 1993 Rock Creek Park Tennis Stadium EIS details how that facility should be managed. The preferred alternative allows for one professional tennis tournament a year, with the possibility of a second large-scale professional tournament under certain circumstances. Other uses allowed for are amateur and league tennis and public court use and instruction. Parking is restricted on grass fields during large-events to reduce impacts from soil disturbance and erosion. Any application for WTF in the area of the Tennis Stadium would need to be consistent with these planned uses.

TABLE 3: ZONE MANAGEMENT ALTERNATIVE: ALTERNATIVE B

GMP Zone or Park Unit	Plan Covering Area/unit	Potential issues to be addressed through permit terms and conditions	Reasoning and Regulatory References
Other Rock Creek Park Managed Units (smaller units, traffic circles, etc.)	Land managed under general NPS authorities pertaining to all NPS managed units, no planning document is available	<p>The following terms and conditions, alone or in combination, would be applicable for this zone:</p> <p>The facility would be prohibited if there is an impact to natural or cultural resources including viewsheds, cultural landscapes, historic structures, wetlands, breeding bird census areas, sensitive species habitat, etc.</p> <p>Existing infrastructure (power and fiber optic lines) must exist in the vicinity of the proposed facility.</p> <p>Use of concealed facilities, such as lamp posts, would be required as well as the use of concealed equipment storage facilities. In smaller units, such as traffic circles or triangle parks, allow only equipment cabinets that conform to a certain size to address space restrictions in these smaller units.</p>	Facilities may be granted in units of the park not discussed above. Facilities in these units would be subject to permit terms and conditions to avoid impacts to natural and cultural resources. The park would review each of these applications and would not permit facilities in areas with sensitive natural or cultural resources, or in an area that having WTF would be contrary to the park's enabling legislation, purpose, and significance. No facilities would be permitted that would result in a conflict with the NPS mission, including the preservation of natural and cultural resources, or the current or planned uses of the property.

FIGURE 8: ZONE MANAGEMENT APPLICATION PROCESS



ALTERNATIVE C: MANAGEMENT TO FOCUS ON COVERAGE GAPS (PREFERRED ALTERNATIVE)

In alternative C, the park would assume that most applications submitted by providers would focus on addressing coverage gaps and would encourage providers to site where these gaps occur over other locations throughout Rock Creek Park units. Coverage gaps occur mainly along Beach Drive in Reservation 339 and the secondary roads that connect to it. The park has identified areas where coverage gaps for wireless telecommunication services currently exist (where gap is defined as no coverage or coverage below “in-car” level) in figure 9. Although the park would encourage applicants to site in the Beach Drive area, applications for other areas of the park would be evaluated using the criteria outlined in alternative B. The criteria for evaluating facilities proposed for siting along Beach Drive would differ for alternative C. This alternative would strive to address the areas where there are existing coverage gaps, and encourage location of all future WTF in a single area to minimize impacts to natural and cultural resources throughout the park.

In alternative C, the park would provide specific requirements applicants should consider when applying for a right-of-way permit for a facility located on Beach Drive that would be included as permit terms and conditions. These requirements are necessary to address the cultural resource value of Beach Drive, including its designation as a cultural landscape and the cultural sites along the roadway, recognizing that this is the area where the majority of future applications would be expected. Rock Creek and Potomac Parkway is significant in part because it is the first federally constructed parkway, one of the best examples of early parkway design, and it provides a scenic gateway to the city’s monumental core. Any facilities that would detract from this experience or alter the historic setting of this area would be considered an unavoidable conflict to the park’s mission and the planned use of the parkway.

Specific requirements described in this alternative relate to the physical features of potential WTF, including height or width in order to ensure protection of the park’s natural and cultural resources. In addition to the following specifications that address concerns related to maintaining the natural and cultural values of the area, physical features regulated by the applicable authorities described in table 2 would also apply. The following permit terms and conditions would apply for alternative C in the area around Beach Drive that currently lacks WTF coverage:

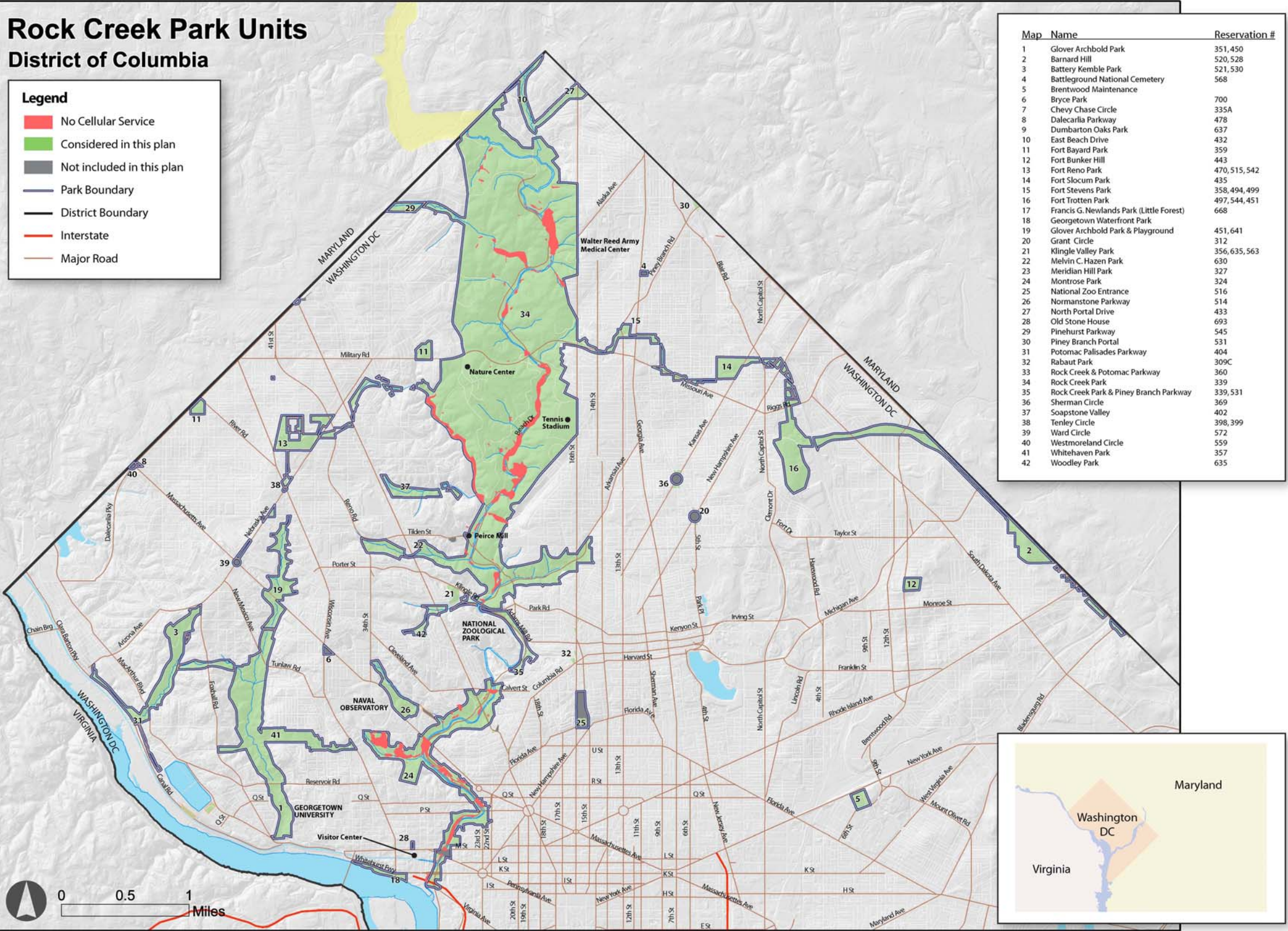
- All structures associated with the facility (support structure, equipment cabinet, etc.) must be concealed, using the newest technology available.
- Facilities must be no taller than 30 feet, the height of the tallest structures in the area (the historic light poles along the roadway).
- The width of a facility support structure must be no wider than 8 inches in diameter or 8 inches square. Equipment cabinets associated with the support structure must be no larger than three feet cubed.
- Trenching for infrastructure (electric and fiberoptic) should be minimized and should leave no visible trace that trenching occurred in the area.
- In general, no WTF siting would be allowed in the Forest Zone. However, minimal amounts of the Forest Zone may be disturbed to allow for concealed equipment cabinets. The impacts of using the Forest Zone must be fully evaluated in the applicant’s NEPA document. If disturbance in the Forest Zone is necessary to conceal equipment cabinets, the following terms and conditions would apply:
 - No trees over 4 inches diameter at breast height (dbh) could be removed;
 - No new access into the Forest Zone could be created; and

ALTERNATIVES

- No tunneling under Rock Creek would be permitted.

All design requirements, including these, are subject to review during each permit renewal, and may change based on the capability of emerging technologies. Moreover, the NPS recognizes that new WTF technologies may offer a facility that does not meet these requirements, but similarly protects the cultural resources of the area. The NPS will therefore attempt to keep potential applicants apprised of any changes or developments in the permit terms and conditions.

FIGURE 9: AREAS IN ROCK CREEK PARK MANAGED UNITS WITH GAPS IN WIRELESS TELECOMMUNICATIONS COVERAGE



HOW ALTERNATIVES MEET OBJECTIVES

As stated in Chapter 1: “Purpose and Need for Action” all action alternatives selected for analysis must meet all objectives to a large degree. The action alternatives must also address the stated purpose of taking action and resolve the need for action; therefore, the alternatives, and the effects they would have in the study area were individually assessed in light of how well they would meet the objectives of this WTF plan/EA as compared to alternative A, the no-action alternative. Alternatives that did not meet the objectives were not analyzed further (see the “Alternatives Considered but Rejected” section).

Table 4 compares how each of the alternatives described in this chapter would meet the listed project objectives listed in chapter 1. The “Environmental Consequences” chapter describes the effects on each impact topic under each of the alternatives. These impacts are summarized in table 5. These tables are at the end of this chapter.

ALTERNATIVES CONSIDERED BUT REJECTED

During the public scoping period the NPS received a number of suggestions for alternatives, which the NPS considered but deemed them to be unreasonable so they were not carried forward in this plan/EA. These proposed alternatives are: extending existing permits, additional fees for WTF providers, requiring co-location, no new construction, no new facilities, allow only buried cables, and do not allow cell phone use on Rock Creek Park trails. In some instances these suggestions are already being implemented to the extent possible under the applicable authorities. The justification for eliminating these options from further analysis was otherwise based on the following factors:

- Lack of technical feasibility
- Economic infeasibility
- Inability to meet the project’s purpose and need.

CHANGE IN RIGHT-OF-WAY PERMIT CONDITIONS AND PROCESSES (CONSIDERED BUT REJECTED)

Commenters suggested various ways that the right-of-way permits for WTF could be altered. These changes included extending existing permits rather than renewing them, changing the fee structure to include a surcharge for impacts to the park, and requiring that applicants first use co-location on existing facilities when there is the option.

Extending Existing Permits. One commenter suggested that existing permits should be extended rather than renewed. Under the current process the NPS is required to follow, there is no difference between the terms “extend” and “renew.” RM-53 requires that right-of-way permits, including permits for WTF, be issued for no more than 10 years. The park may renew, or essentially extend, a permit after considering factors such as the impacts to park values, whether an activity is still authorized under the law and whether there have been any significant changes. If these factors still support permit renewal and there are not significant changes, the permit is renewed after completing the NEPA analysis in the form of a categorical exclusion and approval by the NCPC and CFA, although in some instances this NEPA compliance would require further analysis such as an EA. This permit would also be updated to contain changes made in these permits themselves as a result of changes in law, regulation and policy, and to reflect any changes in the fees as a result of changes in fair market value. The NCPC requires renewal of WTF permits every 5 years. Therefore, the renewal of permits for this park every 5 years by the NPS is consistent with the review process of the NCPC. See RM-53, Appendix 5 for additional information about the renewal process.

Additional Fees. Commenters suggested that the park charge a rental fee for each facility, as well as an annual surcharge to offset damage to the park's scenic and environmental values. The park already charges those fees allowable by law and has done so starting with the first right-of-way permit for the WTF located in the park. When established, the permit holders for the existing facilities were charged an annual fee of \$30,000 per site that would increase 3% per year. When the permit was renewed in 2004, the combined fee for both sites was \$69,556, to be increased 3% annually. In 2006, the permit fee for both sites combined was approximately \$73,800 (A. Applewhaite-Coleman, NPS, pers. comm., L. Gillham, NPS, Oct. 26, 2007). This permit fee is established based on estimates of fair market value, and fees collected go into the U.S. General Treasury as authorized under the applicable authorities. The fee would continue under all alternatives. In regards to additional punitive fees, the NPS does charge fees to recover its costs associated with the permit and, as for fees for damage to park resources, permittees are only allowed to conduct those actions included within their permit. Any actions conducted outside the permit conditions that cause damage to any of the park's resources would be the responsibility of the permittee and would be addressed and remediated by the permittee.

Require Co-location. The NPS Management Policies 2006 encourage the use of co-location and ask park superintendents to evaluate applications for the maximum potential for co-location. Although the policies do not require co-location, the NPS has made this a condition in the permits it has issued for the park, that these permittees agree to consider co-location by other providers, and would follow its guidance and encourage co-location under all alternatives.

NO NEW CONSTRUCTION (CONSIDERED BUT REJECTED)

Under a no new construction alternative, the park would not consider any applications for construction of additional WTF, but would consider applications for co-location on the current facilities at the maintenance yard and tennis center. The NPS already encourages co-location on the two existing WTF in the park. Under the applicable authorities, however, the park is required to consider applications for locations throughout the park and to permit WTF for applicants in those places in the park where WTF would not interfere with the planned purposes or the mission of the park. Therefore, the adoption of an alternative that does not allow for any new facilities is not legally feasible at this time in light of the applicable authorities. Because this alternative could not be implemented without changes to the applicable authorities, it was not considered reasonable at present and not carried forward for further analysis.

NO NEW FACILITIES (CONSIDERED BUT REJECTED)

Some commenters suggested that there be no additional WTF beyond those already present in the park, including no co-location on the existing WTF. This was not carried forward as an alternative because under the applicable authorities the park is required to consider applications and grant them where they would not interfere with the planned purposes of the park or the mission of the NPS. Two WTF are already present in the park and co-location on these facilities would be evaluated and potentially permitted as well as for any future WTF. Therefore, an alternative that does not allow new facilities, including no co-location on existing facilities, was not carried forward for detailed analysis.

ALLOW ONLY BURIED CABLES (CONSIDERED BUT REJECTED)

Although at present WTF technology uses a combination of above ground and buried cables, only technologies using buried cables have been used in the park and would be considered for future WTF applications to be consistent with past practices, as would be stated in the permits terms and conditions. Buried cables would also be considered the latest technology, which is required by new WTF applicants under NPS 2006 Management Policies. Because technology using above

ground cables would not be permitted, a specific requirement for buried cables is implicitly included in all alternatives and does not need to be added as an alternative element.

DO NOT ALLOW CELL PHONE USE ON ROCK CREEK PARK TRAILS (CONSIDERED BUT REJECTED)

This option, while pertaining to WTF, is not directly related to this plan since the proposal does not address the potential siting of WTF in the park. Therefore it was not considered as an alternative. Moreover, WTF sited in the park might not cover all park areas. If wireless coverage is available on Rock Creek Park trails, park users do have the option of using cell phones. This coverage may or may not originate from WTF located within the park, and in many cases, is provided by the numerous WTF located outside the park's boundary. *NPS Management Policies 2006* directs that parks, in reviewing WTF applications, "consider the potential benefit of having telephone access to emergency law enforcement and public safety services," and that "[a]s appropriate, superintendents should...caution park users of the limited (or nonexistent) cellular service and their personal responsibility to plan accordingly" (Section 8.6.4.3, Telecommunication Sites).

ENVIRONMENTALLY PREFERRED ALTERNATIVE

In addition to identifying the preferred alternative, the NPS has also identified the "environmentally preferred alternative" as defined by the U.S. Council on Environmental Quality (CEQ). The NPS describes it as, "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves and enhances historic, cultural, and natural resources" (CEQ 1981). There is no requirement that the environmentally preferred alternative and the preferred alternative be the same. After completing the environmental impact analysis, the NPS identified alternative C as the environmentally preferred alternative in this EA because it best meets the definition established by the U.S. Council on Environmental Quality.

TABLE 4: ANALYSIS OF HOW ALTERNATIVES MEET THE OBJECTIVES

Objectives in Taking Action	Alternative A: No-Action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Management Methodology			
Provide the foundation for decision-making regarding the issuance of right-of-way permits for the provision of WTF within Rock Creek Park administered units.	Partially meets objective. Although there would be a process for evaluating WTF in the park, this process would not be as efficient, as providers could submit applications anywhere in the park, even if the applications would not be approved. This would result in delay and inefficiencies in the process.	Fully meets objective. In addition to the process set forth in RM-53, additional criteria and permit terms and conditions would be developed and used that would provide a more efficient foundation with identifiable standards for the application process.	Fully meets objective. In addition to the process set forth in RM-53, additional criteria and permit terms and conditions would be developed and used that would provide a more efficient foundation with identifiable standards for the application process.
Establish criteria for determining where WTF would or would not be appropriate in Rock Creek Park.	Partially meets objective. The park would consider applications under RM-53 and though this process, including NEPA analysis, determine if a facility would be appropriate, or be in conflict with the park mission or a planned land use. In addition to the NEPA process, the park would use park planning documents to determine if an area would or would not be appropriate.	Fully meets objective. This alternative further looks at areas where a right-of-way permit for WTF might be granted and sets terms and conditions that contribute to WTF being an appropriate use.	Fully meets objective. In addition to the process set forth in RM-53, this alternative identifies areas that are not appropriate for WTF and where permits for these facilities would not be granted. It further looks at areas where the highest demand is expected to address known coverage gaps and sets specific permit terms and conditions for these areas that contribute to WTF being an appropriate use, and serve to further protect park resources.
Provide guidance on how the park can meet the requirements set out in the applicable authorities of the Telecommunications Act of 1996, the 1995 Presidential Memorandum, and government-wide procedures, and relevant NPS laws, regulations, and policies as they relate to the installation, operation, and maintenance of WTF.	Fully meets objective. In this alternative, all applicable guidance would be followed by the park and the applicant during the application process. These guidance documents would be readily available throughout the process.	Fully meets objective. In this alternative, all applicable guidance would be followed by the park and the applicant during the application process. These guidance documents would be readily available throughout the process.	Fully meets objective. In this alternative, all applicable guidance would be followed by the park and the applicant during the application process. These guidance documents would be readily available throughout the process.

TABLE 4: ANALYSIS OF HOW ALTERNATIVES MEET THE OBJECTIVES

Objectives in Taking Action	Alternative A: No-Action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Determine management measures for the installation, operation, and maintenance of WTF that can be implemented to protect the park units' cultural and natural resources.	Partially meets objective. The park would consider applications under RM-53 and through this process, including NEPA analysis, determine if a facility would be appropriate, or be in conflict with the park mission or a planned land use. During this process, the park would work with the applicant to develop permit terms and conditions that would protect the park's resources, but there would be no predetermined terms and conditions to simplify and potentially streamline the application process.	Fully meets objective. In this alternative, specific permit terms and conditions have been identified for each zone where WTF permits might be granted. These predetermined permit terms and conditions assist in protecting the park's cultural and natural resources, and would serve to simplify and potentially streamline the application process.	Fully meets objective. In this alternative, specific permit terms and conditions would be identified for each zone where WTF permits might be granted. These predetermined permit terms and conditions would further assist in protecting the park's cultural and natural resources, and would serve to simplify and potentially streamline the applications process, especially in the areas with coverage gaps. Further, this alternative may protect more areas of the park by encouraging applications in a more limited area and providing a greater degree of protection to the park's cultural and natural resources.
Serve and maintain the management prescriptions and goals outlined in the Rock Creek Park and the Rock Creek and Potomac Parkway Final General Management Plan as they relate to the installation, operation, and maintenance of WTF.	Fully meets objective. In this alternative, all applications submitted to the park would be subject to the NEPA process. As part of that process the application would be evaluated for consistency with the park's GMP.	Fully meets objective. In this alternative, all applications submitted to the park would be subject to the NEPA process. As part of that process the application would be evaluated for consistency with the park's GMP. This alternative further looks at the GMP zones and identifies where WTF would not be appropriate based on the prescriptions and goals outlined for that zone.	Fully meets objective. In this alternative, all applications submitted to the park would be subject to the NEPA process. As part of that process the application would be evaluated for consistency with the park's GMP. This alternative further looks at the GMP zones and identifies where WTF would not be appropriate based on the prescriptions and goals outlined for that zone.

TABLE 4: ANALYSIS OF HOW ALTERNATIVES MEET THE OBJECTIVES

Objectives in Taking Action	Alternative A: No-Action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Wildlife and Wildlife Habitat			
Incorporate best available research related to the construction, operation, and maintenance of WTF and the effect on wildlife and wildlife habitat, specifically migratory birds.	Fully meets objective. In this alternative, all applications submitted to the park would be subject to the NEPA process. As part of that process the application would be evaluated for impacts to the park's wildlife species, including migratory birds and this evaluation would be required to incorporate the best available research related to these subjects. All future permits may be subject to additional permit terms and conditions based on the results of the ongoing study of potential bird impacts related to WTF at the two existing WTF in the park.	Fully meets objective. In this alternative, all applications submitted to the park would be subject to the NEPA process. As part of that process the application would be evaluated for impacts to the park's wildlife species, including migratory birds and this evaluation would be required to incorporate the best available research related to these subjects. All future permits may be subject to additional permit terms and conditions based on the results of the ongoing study of potential bird impacts related to WTF at the two existing WTF in the park.	Fully meets objective. In this alternative, all applications submitted to the park would be subject to the NEPA process. As part of that process the application would be evaluated for impacts to the park's wildlife species, including migratory birds and this evaluation would be required to incorporate the best available research related to these subjects. All future applications may be subject to additional permit terms and conditions based on the results of the ongoing study of potential bird impacts related to WTF at the two existing WTF in the park.
Specify wildlife and wildlife habitat resource conditions to be protected and maintained at all Rock Creek Park administered units as related to the installation, operation, and maintenance of WTF.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and through this process, including NEPA analysis. Through this analysis, the park would ensure that wildlife and wildlife habitat resources are protected and maintained. Because it would be inconsistent with the planned uses and mission of the park, facilities would not be permitted in the Forest Zone, providing protection to the majority of wildlife and wildlife habitats in Rock Creek Park.	Fully meets objective. In this alternative, WTF permits would not be granted in certain areas and zones of the park that contain the majority of the wildlife and wildlife habitat resources, such as the Forest Zone. In areas of the park where WTF permits would be granted, certain permit terms and conditions would be applied that would provide further protection to the park's wildlife and wildlife habitat.	Fully meets objective. As part of this alternative, applicants for WTF would be encouraged to locate in the areas that currently lack cellular coverage. By encouraging concentration of these facilities, there is a greater potential that less habitat would be disturbed when compared to alternatives A and B and greater protection would occur for these resources. Further, this alternative would encourage applicants to site WTF along roadways or more developed areas, providing additional protection for wildlife and wildlife habitat.

TABLE 4: ANALYSIS OF HOW ALTERNATIVES MEET THE OBJECTIVES

Objectives in Taking Action	Alternative A: No-Action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Cultural Resources			
Specify cultural resource conditions to be protected and maintained at all Rock Creek Park administered units as related to the installation, operation, and maintenance of WTF.	Partially meets objective. In this alternative, the park would consider applications under RM-53 and though this process, including NEPA and NHPA analysis. Through this analysis, the park would ensure that cultural resources are protected and maintained, but would have no set terms and conditions that apply to applications for facilities in areas with known cultural resource concerns.	Partially meets objective. In this alternative, WTF would still be in the Cultural Resources Zone of the main unit of Rock Creek Park, with specific permit terms and conditions in these areas, creating the potential that these resources could be impacted.	Fully meets objective. In this alternative, applicants would be encouraged to site in areas where there are currently gaps in telecommunication coverage. In the areas where WTF would be encouraged to site, specific permit terms and conditions would be applied that would offer additional protection to cultural resources in those areas.
Protect those features contributing to the historic designed landscape of all Rock Creek Park administered units.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and though this process, including NEPA and NHPA analysis. Through this analysis, the park would be able to identify any potential impacts to historic landscapes which would allow the park to avoid potential impacts to the historic designed landscapes of all Rock Creek Park administered units.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and though this process, including NEPA and NHPA analysis. Through this analysis, the park would be able to identify any potential impacts to historic landscapes which would allow the park to avoid potential impacts to the historic designed landscapes of all Rock Creek Park administered units.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and though this process, including NEPA and NHPA analysis. Through this analysis, the park would be able to identify any potential impacts to historic landscapes which would allow the park to avoid potential impacts to the historic designed landscapes of all Rock Creek Park administered units.
Health and Safety			
Ensure public safety within the park.	Partially meets objective. In this alternative, the park would consider applications under RM-53. This alternative would not encourage siting to address current coverage gaps, so these may be no reduction areas of the park where visitors do not have wireless coverage.	Fully meets objective. In this alternative, the park would consider applications under RM-53. This alternative would limit the area where WTF permits would be granted to certain zones and areas of the park. Many of these areas, which are areas of high visitor use, have wireless coverage, and do not present concerns for public safety within in the park.	Fully meets objective. In this alternative, the park would consider applications under RM-53. This alternative would encourage applicants to site in specific areas that currently lack wireless coverage. Many of these areas, which are areas of high visitor use, do not currently have wireless coverage and this alternative would encourage providing the lacking coverage in these areas.

TABLE 4: ANALYSIS OF HOW ALTERNATIVES MEET THE OBJECTIVES

Objectives in Taking Action	Alternative A: No-Action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Protect the health and safety of park employees and visitors from exposure to WTF.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and though this process, would require that all facilities comply with FCC and all other applicable regulations, and the applicable authorities, regarding radiofrequency exposure.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and though this process, would require that all facilities comply with FCC and all other applicable regulations, and the applicable authorities, regarding radiofrequency exposure.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and though this process, would require that all facilities comply with FCC and all other applicable regulations, and the applicable authorities, regarding radiofrequency exposure.
Land Use			
Communicate and coordinate with adjacent property owners, existing land use plans and policies affecting the area, and other local and federal entities and authorities such as the NCPC and the Commission of Fine Arts during the development and implementation of a WTF plan.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and through this process would require the applicant to conduct the necessary outreach and public involvement required under NEPA. The NEPA analysis would also require the applicant to consider the existing land use plans and policies affecting the area. As part of this process, the park would coordinate with the NCPC and the CFA.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and through this process would require the applicant to conduct the necessary outreach and public involvement required under NEPA. The NEPA analysis would also require the applicant to consider the existing land use plans and policies affecting the area. As part of this process, the park would coordinate with the NCPC and the CFA.	Fully meets objective. In this alternative, the park would consider applications under RM-53 and through this process would require the applicant to conduct the necessary outreach and public involvement required under NEPA. The NEPA analysis would also require the applicant to consider the existing land use plans and policies affecting the area. As part of this process, the park would coordinate with the NCPC and the CFA.

Note: Alternatives were measured based on the following scale: Does not meet objectives; Partially meets objectives; Fully meets objectives

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Flora and Fauna	<p>Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term minor adverse impacts to flora or fauna are expected in alternative A as a result of habitat disturbance and loss during the construction, operation, and maintenance of potential future WTF throughout the park. Long-term negligible adverse impacts would be expected for co-located facilities on existing sites. Long-term moderate adverse cumulative effects would be expected for alternative A. Impairment to flora and fauna would not occur.</p>	<p>Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term minor adverse impacts are expected from ground and noise disturbance during construction, operation, and maintenance of WTF; however, impacts are expected to be less than those described in alternative A, as zone/area specific permit terms and conditions would require certain types of technologies that would promote less disturbance of habitat. Long-term minor adverse cumulative impacts would occur for alternative B. Impairment to flora and fauna would not occur.</p>	<p>Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term negligible adverse impacts are expected from construction, operation, and maintenance of WTF as siting would be encouraged in areas of the park with coverage gaps, and specific terms and conditions would be applied to applications in these areas. For siting requests in areas that do not have coverage gaps, these applications would be evaluated by zone as described in alternative B, with long-term, minor, adverse impacts for facilities sited in these areas. Long-term negligible adverse cumulative impacts would occur for alternative C. Impairment to flora and fauna would not occur.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Sensitive Species	<p>Long-term beneficial impacts to sensitive species are expected from prohibiting facilities in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas. Short- and long-term negligible to minor adverse impacts to sensitive species are expected as a result of implementing alternative A. However, it is likely that only negligible impacts would occur as all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to WTF, which would limit any direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse impacts are expected for co-located facilities on existing WTF, as no sensitive species habitat is present around these WTF. Long-term negligible adverse cumulative effects would occur for alternative A. Impairment to sensitive species would not occur.</p>	<p>Impacts for alternative B would be the same as those in alternative A.</p>	<p>Long-term beneficial impacts to sensitive species are expected from prohibiting facilities in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas and from encouraging future sitings in areas with known coverage gaps. Long-term negligible adverse impacts would occur from encouraging siting in this one area and the associated permit terms and conditions for WTF. Further, all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to WTF, which would limit any direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse cumulative impacts would occur for alternative C. Impairment to sensitive species would not occur.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Avian Species	<p>In the no-action alternative there would be long-term beneficial impacts from not siting WTF in the main areas of avian habitat, prohibitions on fencing, and the potential for co-location on existing WTF, which all reduce the potential for habitat fragmentation. Long-term minor to moderate adverse impacts to avian species could occur from habitat loss and increased collision risk, depending on the number of WTF sited in the park. A lack of a clear height restriction, outside the USFWS guidelines, for future WTF for alternative A would result in long-term moderate adverse impacts. During construction of new WTF, short-term minor adverse impacts would be expected to occur from the temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, minor to moderate, and adverse. In the no-action alternative, impairment to avian species would not occur.</p>	<p>In alternative B there would be long-term beneficial impacts from not siting WTF in main areas of avian habitat, prohibitions on fencing, additional design requirements that could result in shorter facilities, and the potential for co-location on existing facilities as these actions reduce the potential for habitat fragmentation. Long-term negligible to minor adverse impacts would occur in those areas of the park where WTF would be granted due to the potential for habitat loss and bird collisions with WTF facilities. During construction of new WTF, short-term minor adverse impacts would be expected to occur from the temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, minor to moderate, and adverse. In alternative B, impairment to avian species would not occur.</p>	<p>In alternative C there would be long-term beneficial impacts from not siting WTF in main areas of avian habitat, encouraging siting in a specific area of the park where coverage gaps exist, prohibitions on fencing, specific design requirements that would result in shorter facilities, restriction on disturbance in the Forest Zone, and the potential for co-location on existing facilities as these actions reduce the potential for habitat fragmentation. Long-term negligible adverse impacts would occur in those areas of the park where WTF would be granted due to the potential for habitat loss and bird collisions with WTF facilities in these areas that are not considered the main areas of habitat for avian species. During construction of new WTF, short-term negligible to minor adverse impacts would be expected to occur from temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, negligible to moderate, and adverse. In alternative C, impairment or impacts to avian species would not occur.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Air Quality	Alternative A would have short-term minor adverse impacts to air quality during construction of new WTF, with long-term negligible adverse impacts during operation of the facilities. The construction, operation, and maintenance of potential future WTF is not expected to have a regional impact and would be in accordance with all provisions set forth in the SIP. Cumulative impacts for alternative A would be long-term minor adverse. Impairment to air resources and quality would not occur.	Impacts for alternative B would be the same as in alternative A.	Impacts for alternative C would be the same as in alternative A.
Soundscapes	Due to the potentially sensitive nature of some areas of the park, long-term adverse impacts to soundscapes from alternative A would range from minor to moderate, based on the location of the facility. During construction, short-term minor to moderate adverse impacts would be expected due to the use of heavy equipment. Cumulative impacts for alternative A would long-term moderate adverse. Impairment to park soundscapes would not occur.	Due to the potentially sensitive nature of some areas of the park, short- and long-term adverse impacts to soundscapes from alternative B would range from minor to moderate, based on the location of the facility. The requirement for certain types of technologies in certain zones and areas of the park would result in these impacts mainly being minor. Cumulative impacts for alternative B would long-term minor to moderate adverse. Impairment to park soundscapes would not occur.	Applicants for WTF would be encouraged to site in areas with coverage gaps, which have levels of high ambient noise, resulting in short-term minor adverse and long-term negligible adverse impacts. In those areas of the park where there are no coverage gaps, there would be short- and long-term minor to moderate impacts, depending on how sensitive the resources in the zone or area are to noise. Cumulative impacts for alternative C would be long-term negligible adverse. Impairment to park soundscapes would not occur.

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Historic Resources	<p>The potential siting of new WTF within historic resources listed or eligible for the National Register under the proposed application process described in alternative A would have minor long-term adverse impacts (no adverse effect under NHPA Section 106) on historic resources as the park's management documents would prevent WTF from siting in areas with sensitive cultural resources. Cumulative impacts would be long-term minor and adverse (no adverse effect under NHPA Section 106). Impairment to historic resources would not occur for alternative A.</p>	<p>The potential siting of new WTF within historic resources listed or eligible for the National Register under the proposed application process outlined in alternative B would have long-term minor adverse impacts (no adverse effect under NHPA Section 106) on historic resources, with the set permit terms and conditions providing beneficial impacts. Cumulative impacts would also be long-term minor and adverse (no adverse effect under NHPA Section 106). Impairment to historic resources would not occur for alternative B.</p>	<p>Installation of one or more WTF along Beach Drive or in other areas of Rock Creek Park subject to specific permit terms and conditions that would utilize the newest and disguised technology and conditions regarding size and height of the facilities would have negligible to minor long-term adverse impacts (no adverse effect under NHPA Section 106) on the Rock Creek Park Historic District for alternative C depending on the number of WTF established in any one area. Cumulative impacts from the combination of these impacts with those from past, present, and future actions would remain negligible to minor long-term adverse impacts (no adverse effect under NHPA Section 106). Impairment to historic resources would not occur for alternative C.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Cultural Landscapes	<p>Potential siting of new WTF within cultural landscapes listed or eligible for the National Register under the proposed application process outlined in alternative A would have long-term minor adverse impacts (no adverse effect under NHPA Section 106) on the park's cultural landscapes. Cumulative impacts would also be long-term, minor, and adverse (no adverse effect under NHPA Section 106). Impairment to cultural landscapes would not occur for alternative A.</p>	<p>The potential siting of new WTF within cultural landscapes listed or eligible for the National Register under the proposed application process outlined in alternative B would have long-term minor adverse impacts (no adverse effect under NHPA Section 106) on the park's cultural landscapes, with the established permit terms and conditions in each zone lessening these impacts. Cumulative impacts would also be long-term, minor, and adverse (no adverse effect under NHPA Section 106). Impairment to cultural landscapes would not occur for alternative B.</p>	<p>Siting one or more WTF along Beach Drive, where siting would be encouraged, or in other existing coverage gap areas would be subject to specific permit terms and conditions that would utilize the newest and disguised technology, as well as permit conditions regarding size and height of the facilities, would have long-term negligible to minor adverse impacts (no adverse effect under NHPA Section 106) on the park's cultural landscapes for alternative C. The permit terms and conditions specific to areas with coverage gaps would provide further protection for cultural landscapes in those areas. Cumulative impacts from the combination of these impacts with those from past, present, and future actions would remain long-term negligible to minor adverse impacts (no adverse effect under NHPA Section 106). Impairment to cultural landscapes would not occur for alternative C.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Archeological Resources	<p>In alternative A, limiting the placement of WTF pursuant to the applicable authorities would result in long-term negligible impact on archeological resources of the park as the resources in the zones and areas would be protected. In areas where WTF would be sited, applicants would be required to comply with NEPA and NHPA Section 106, which would include testing to identify and evaluate the eligibility of potential site pursuant to Section 106. Due to the excavations associated with the identification and evaluation of potential National Register-eligible archeological sites within proposed new WTF sites, including antenna support structures, alternative A would potentially have long-term minor to moderate impacts (no adverse effect under NHPA Section 106) on archeological resources. Cumulative impacts would be long-term minor to moderate adverse (no adverse effect under NHPA Section 106). Impairment to archeological resources would not occur for alternative A.</p>	<p>Management zones or areas that provide specific permit terms and conditions would result in long-term negligible impact on archeological resources of the park as the resources in the zones and areas would be protected, with minor to moderate adverse impacts occurring from necessary excavations. Alternative B would potentially have long-term minor to moderate adverse impacts (no adverse effect under NHPA Section 106) to archeological resources due to these ground disturbances. Cumulative impacts would also be long-term minor to moderate adverse (no adverse effect). Impairment to archaeological resources would not occur for alternative B.</p>	<p>Impacts to the archeological resources in the units of Rock Creek Park resulting from alternative C would be long-term and range from negligible to moderate adverse impacts (no adverse effect under NHPA Section 106). Cumulative impacts would also be long-term and range from negligible to moderate (no adverse effect under Section 106). Impairment to archaeological resources would not occur for alternative C.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Visitor Use and Experience	<p>In the no-action alternative, there would be long-term negligible to moderate adverse impacts as various user groups are impacted differently from the noise, visual, and physical presence of WTF in various units of Rock Creek Park. In general, those visitors seeking solitude would be impacted moderately, while those who are engaging in activities such as commuting or pleasure driving would be impacted negligibly. Cumulative impacts for the no-action alternative would be long-term, minor, and adverse.</p>	<p>In alternative B, impacts to visitor use and experience would mainly be long-term minor adverse as WTF would be subject to specific permit terms and conditions that would likely result in WTF that are less intrusive on the visitor experience. These impacts would increase to long-term moderate adverse in low intensity visitor use areas where WTF would be more intrusive on the visitor experience.</p>	<p>In alternative C, encouraging applicants to site WTF where coverage gaps exist along Beach Drive would be expected to have long-term negligible impact to visitor use and experience as this area hosts mostly high intensity visitor uses including commuting and pleasure driving. These types of uses would not be expected to be impacted as much by the visual presence or the noise associated with WTF a more passive uses, such as hiking. These uses may also benefit from having cellular coverage. In all other units of Rock Creek Park, impacts would mainly be long-term minor adverse in higher intensity use areas as WTF would be subject to specific permit terms and conditions that would likely result in WTF that are less intrusive on the visitor experience. These impacts would increase to long-term moderate adverse in low intensity visitor use areas where WTF would be more intrusive on the visitor experience. Cumulative impacts for alternative C would be long-term, negligible, and adverse.</p>

TABLE 5: SUMMARY OF IMPACTS

Impact Topic	Alternative A: No-action Alternative	Alternative B: Zone Management	Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)
Socioeconomic Resources	In the no-action alternative, impacts to property values, including home values in the areas surrounding the park, would be long-term negligible adverse, with long-term beneficial impacts to public finance. Long-term negligible beneficial cumulative impacts would occur.	In alternative B, impacts to property values, including home values in the areas surrounding the park, would be long-term negligible adverse with potential long-term negligible impacts occurring from the requirement for concealed facilities and equipment buildings. Long-term beneficial impacts to public finance would also be expected. Cumulative impacts would be long-term and beneficial.	In alternative C, impacts to property values, including home values in the areas surrounding the park, would be long-term negligible adverse. In areas with coverage gaps where facility siting would be encouraged, there would be potential long-term beneficial impacts occurring from the requirement for concealed facilities and equipment buildings, and the potential for concentration of WTF in areas that are not surrounded by residential properties. Long-term beneficial impacts to public finance would also be expected. Cumulative impacts would be long-term and beneficial.
Human Health and Safety	Impacts would be long-term beneficial from increased coverage and the ability to reach emergency services, and long-term negligible adverse from any change in the number of accidents related to cellular phone use while driving. There would no impacts from radiofrequency emissions as any new WTF would be required to comply with FCC regulations. Cumulative impacts for the no-action alternative would be long-term and beneficial.	Impacts for alternative B would be the same as those in alternative A.	Impacts for alternative C would be the same as those in alternative A.
Park Management and Operations	The lack of pre-determined areas and associated permit terms and conditions for WTF would result in longer application process and have long-term minor adverse impacts. Cumulative impacts to park operations and management for the no-action alternative would be long-term minor to moderate adverse.	Because a more formalized process would be created with set areas for consideration, as well as potential permit terms and conditions, the application process for WTF would be more efficient, resulting in long-term beneficial impacts. Cumulative impacts would be long-term, negligible, and adverse.	Because a more formalized process would be created with set areas for consideration, as well as potential permit terms and conditions, the application process for WTF would be more efficient, resulting in long-term beneficial impacts. Cumulative impacts would be long-term, negligible, and adverse.

AFFECTED ENVIRONMENT

This chapter of the EA describes existing environmental conditions in the areas potentially affected by the alternatives. This section describes the following resource areas: flora and fauna, species of special concern, avian species, air quality, soundscapes, cultural resources, visitor use and experience, socioeconomics, human health and safety, and park management and operations. The affected environment for these areas are discussed for Washington, D.C. in general, Rock Creek and Rock Creek and Potomac Parkway, the Glover-Archbold and White Haven units of Rock Creek Park, and traffic circles and other small parcels managed by Rock Creek Park.

NATURAL RESOURCES

FLORA AND FAUNA

According to the soil survey data for the District of Columbia, 81 percent of the flora and fauna in the District of Columbia have been influenced by urbanization (NRCS 1975). Approximately 19 percent of soils have remained undisturbed, and these areas are mainly located in parks (NRCS 1975). Vegetation types commonly found in the greater Washington, D.C. area range from urban cultivated gardens to patches of deciduous forest. Common fauna likely to occur in the Washington, D.C. area include species adapted to disturbed habitats associated with an urban environment and transient species associated with the adjacent forested habitats such as white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), common raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), northern brown snake (*Storeria dekayi dekayi*), eastern garter snake (*Thamnophis sirtalis*), American toad (*Bufo americanus*), eastern box turtle (*Terrapene carolina*), black rat snake (*Elaphe obsoleta obsoleta*), eastern cotton tail rabbit (*Sylvilagus floridanus*), and eastern chipmunk (*Tamias striatus*) (NPS 2004b). According to the District of Columbia's Wildlife Action Plan (2006) there are 11 species of mammals, 23 species of reptiles, 16 species of amphibians, and 12 species of fish in need of conservation within in the Washington, D.C. area (District of Columbia 2006).

Rock Creek Park and Rock Creek and Potomac Parkway

Throughout the District, 13 vegetation types have been identified that are characterized into the following types (District of Columbia 2006):

- Hardwood Forests – Includes chestnut oak (*Quercus prinus*) forests, mixed oak-beech (*Fagus grandifolia*) forests, loblolly pine (*Pinus taeda*) – mixed oak forests, and Virginia pine (*Pinus virginiana*)-oak forests. Throughout the District, these areas are in fair condition and the area where they are found is decreasing.
- Grasslands/Managed Meadows – These areas are mainly grasses and are composed of vegetation that does not mature into successional growth or shrubland. Scattered shrubs and trees can be supported in these areas. Throughout the District, these areas are in fair condition and the area where they are found is decreasing.
- Early Successional/Shrub-Scrub/Edge – These areas include habitats that have not matured into forest because of periodic natural or human disturbances. They are characterized by natural or semi-natural woody vegetation. Throughout the District, these areas are in fair condition and the area where they are found is decreasing.

- Urban Landscapes – Urban landscapes include both built and natural areas that are managed for human use. Usually these areas are mowed, trimmed, experience a great deal of foot traffic, and are exposed to wind because they are cleared. Throughout the District, these areas are in good condition and are increasing.

In general, vegetation types found throughout the District are the same as those found in Rock Creek Park; however, Rock Creek Park is unique as it provides the largest unbroken forested habitat in the area, providing habitat for much of the city's wildlife and acting as an important contributor to the region's biodiversity. Past surveys have shown that the main units of Rock Creek Park (Reservation 339 and the Rock Creek and Potomac Parkway) serve as a major reservoir of native flora for the region (NPS 2005a). Within the park the deciduous forested habitat is characterized by an overstory dominated by tulip poplar (*Liriodendron tulipifera*) with lesser numbers of hickory species (*Carya* spp.), green ash (*Fraxinus pennsylvanica*), American beech (*Fagus grandifolia*), white oak (*Quercus alba*), northern red oak (*Quercus rubra*), southern red oak (*Quercus falcata*), and black locust (*Robinia pseudoacacia*). Dominant understory species in the forest include American holly (*Ilex opaca*), spice bush (*Lindera bezoin*), common greenbrier (*Smilax rotundifolia*), Japanese honeysuckle (*Lonicera japonica*), English ivy (*Hedera helix*), and poison ivy (*Toxicodendron radicans*) along with various hardwood saplings. Other vegetative types in the park are characterized by maintained lawn with landscaped trees and shrubs, including American holly, white oak, willow oak (*Quercus phellos*), and tulip poplar saplings, and shrubs including witch hazel (*Hamamelis* spp.) and smooth serviceberry (*Amelanchier arborea*).

All of the natural communities at the park are classified as forest types shown in table 6.

TABLE 6: COMMON FOREST TYPES FOUND WITHIN ROCK CREEK PARK AND POTOMAC PARKWAY

Forest Type	Major Tree or Shrub Species-Common Name	Major Tree or Shrub Species-Scientific Name	Distribution throughout the park
<i>Beech-White Oak / Mayapple Forest</i>	beech	<i>Fagus grandifolia</i>	Most widespread association across the park
	white oak	<i>Quercus alba</i>	
	mayapple	<i>Podophyllum peltatum</i>	
<i>Tulip Poplar Forest</i>	tulip (yellow) poplar	<i>Liriodendron tulipifera</i>	Scattered throughout the park
<i>Chestnut Oak Forest</i>	chestnut oak	<i>Quercus prinus</i>	Restricted primarily to hilltops
	black oak	<i>Quercus velutina</i>	
	huckleberry	<i>Gaylussacia baccata</i>	
<i>Sycamore / Green Ash Forest</i>	sycamore	<i>Platanus occidentalis</i>	Occurs only in floodplains, along narrow stream corridors in the park
	green ash	<i>Fraxinus pennsylvanica</i>	
<i>Loblolly Pine / Mixed Oak Forest</i>	loblolly pine	<i>Pinus taeda</i>	Although uncommon in the park, widespread on the coastal plain from New Jersey, Maryland, Virginia, and south.
	white oak	<i>Quercus alba</i>	
	cherrybark oak	<i>Quercus falcate</i>	
	post oak	<i>Quercus stellata</i>	
<i>Virginia Pine-Oak Forest</i>	Virginia pine	<i>Pinus virginiana</i>	Uncommon in the park

The **beech-white oak / mayapple association** is found on moderately dry slopes or gentle gradients on well-drained acidic sandy loam soils. The canopy is dominated by white oak, beech, and tulip poplar, and subcanopy and shrub layer species include American holly, flowering dogwood (*Cornus florida*), and maple-leaved viburnum (*Viburnum acerifolium*), which often forms a well-defined shrub layer. Herbaceous composition ranges from sparse to dense depending on soil type, disturbance history, and moisture. Typical herbaceous species include mayapple (*Podophyllum peltatum*), and jack-in-the-pulpit (*Arisaema atrorubens*). Christmas fern (*Polystichum acrostichoides*) may be locally abundant, typically on hillsides.

Two variants of the beech-white oak/mayapple forest occur in the park; their composition and location relate to the local soil moisture regime. The mixed oak/beech variant occurs on drier sites, while the beech-tulip poplar variant occurs on more mesic (moderately moist) sites. The **mixed oak-beech variant** is characterized by a greater percent cover of oaks and less dominance by tulip poplar. The canopy is co-dominated by a mix of red oak, black oak (*Quercus velutina*), white oak, and chestnut oak. Beech usually occurs in the subcanopy and maple-leaved viburnum is common, but spicebush, hornbeam (*Carpinus caroliniana*), and jack-in-the-pulpit are conspicuously lacking or sparse, which distinguishes this from the classic beech-white oak / mayapple association. On the other hand, the **beech-tulip poplar variant** is characterized by a dominance of tulip poplar and beech in the canopy and subcanopy. Hornbeam is very characteristic and spicebush and viburnums (*Viburnum* spp.) are common in the shrub layer. The herb layer may be diverse, with jack-in-the-pulpit more prevalent. This variant often occurs near streams although not on the floodplain itself.

The **tulip poplar association** occurs on mesic, mid-slope to low-slope sites that were cleared and/or cultivated at one time. The canopy is dominated by tulip poplar, with no co-dominants. Tulip poplar and box elder (*Acer negundo*) comprise the subcanopy, and spicebush and blackberry (*Rubus allegheniensis*) are present in the shrub layer. These sites tend to be weedy, and non-native plants are often prevalent.

The **chestnut oak forest (chestnut oak-black oak / huckleberry association)** occurs on ridgetops, upper slopes, and south-facing slopes on rocky soils with little organic matter. Surface runoff and erosion are common and of concern. There is a predominance of chestnut oak and black gum (*Nyssa sylvatica*) and an absence or sparse cover of white oak. Red oak and/or black oak and red maple (*Acer rubrum*) are often present but sparse. Serviceberry and sassafras (*Sassafras albidum*) are typical in the subcanopy, and vines such as greenbrier and grape (*Vitis* spp.) are common. Characteristic shrubs include blueberry (*Vaccinium pallidum*), huckleberry (*Gaylussacia baccata*), mountain laurel (*Kalmia latifolia*), and azalea (*Rhododendron periclymenoides*). The herbaceous layer tends to be sparse or absent.

The **sycamore / green ash association** is a floodplain forest, found along stream banks, low terraces, and other areas subject to temporary or irregular flooding. It occurs mostly on Codorus silt loam, with smaller deposits of sand and gravel intermixed, on small tracts of 30–40 acres. The canopy is characterized by sycamore and box elder, with red maple and tulip poplar often co-dominant with the sycamore. Green ash, white ash (*F. americana*), and hickory are frequent associates. The shrub layer may be dominated by spicebush, with black haw (*Viburnum prunifolium*) occurring less frequently. Characteristic herbaceous species include jewelweed (*Impatiens capensis*), mild water-pepper (*Polygonum hydropiperoides*), jack-in-the-pulpit, enchanter's nightshade (*Circea quadrisulcata*), skunk cabbage (*Symplocarpus foetidus*), and others.

The **loblolly pine / mixed oak association** is found exclusively on Joppa soils in the park, which are well-drained to excessively well-drained sandy loams of the coastal plain, on mid to lower slopes or in sheltered ravines. This association is distinguished by the relatively high diversity of trees species, including a number of species that are not common at other locations in the park. No single species is dominant in the canopy. The community is characterized by the presence of black cherry (*Prunus*

serotina), sweet gum (*Liquidambar styraciflua*), loblolly pine, blackjack oak (*Q. marilandica*), chestnut oak, post oak (*Q. stellata*), and Southern red oak (*Q. falcata*). Willow oak is typical in the subcanopy and shrub layer. Beech tends to be absent or sparse. Typical shrubs and vines include Pennsylvania blackberry (*Rubus pennsylvanicus*), greenbrier, Virginia creeper (*Parthenocissus quinquefolia*), arrow-wood (*Viburnum dentatum*), poison ivy, and grape. The herbaceous layer tends to be patchy, with seedlings of canopy tree species.

The **Virginia pine-oak association** occurs on well-drained soils of hilltops in the park. It is an early to mid successional forest characterized by the presence of Virginia pine in the canopy. Associates include oaks, tulip poplar, and beech. Maple-leaved viburnum is typical in the shrub layer, and herbs tend to be sparse.

Shrub areas in the park are found in forest openings, either along ecotones or in small gaps within the forest matrix. These occur on many different soil types and are an early successional stage, often with many exotic species. Typically seen are vines growing over blackberry, spicebush, and/or tree seedlings of tulip poplar, cherry, or slippery elm (*Ulmus rubra*).

Meadow habitats are also present in the park, with a total of 15 small meadow areas ranging in size from 0.3 to 4 acres. The meadow areas are composed mostly of deep grass and other herbs that grow when frequent mowing of lawn areas is stopped (NPS 2004b).

Approximately 80 percent (1,662 acres) of the Rock Creek Park is covered with mature second growth forest that is approximately 100 years old. Activities prior to the park's establishment in 1890, such as timber cutting, farming, and Civil War clearing, removed virtually all of the original forest. A few large oaks still living in the park are estimated to be more than 275 years old and may be remnants of virgin growth. Woodlands currently in the park are primarily a mixture of deciduous species typical of the eastern deciduous forest in the later stages of succession (NPS 2005a).

An inventory of park vegetation conducted by park and volunteer staff between 1986 and 1994 documented 656 species of vascular plants in Rock Creek Park between the National Zoo and the Maryland boundary. Five plant species that had been found in the park during a 1919 vegetation inventory were not found during the 1986 through 1994 inventory. They included swamp shadbush (*Amelanchier canadensis*), shooting star (*Dodecatheon meadia*), dwarf chinkapin oak (*Quercus prinoides*), Allegheny chinkapin (*Castanea pumila*), and a wild rose (*Rosa setigera*). The reasons for their absence in the second inventory are unknown.

In addition to woodlands, vegetation in the park includes evergreen species, including remnant Virginia pines, that occur mostly as scattered individuals or small clusters.

The vegetation found in Rock Creek Park and Rock Creek and Potomac Parkway provides suitable habitat for a variety of wildlife including approximately 30 species of mammals. Habitats include forested areas with small openings or edges and meadows. Common species include white-tailed deer, raccoon, red fox, gray fox, opossum, beaver (*Castor canadensis*), gray squirrel, and eastern chipmunk. Coyotes (*Canis latrans*) have been sighted since May 2004 and confirmed by park staff in September 2004. Most of the sightings have been on the western side of the park in the Oregon Avenue/Bingham Road and Oregon Avenue/Military Road areas (NPS 2007d).

The park's wildlife also includes reptiles and amphibians. Although historically there were 17 amphibian and 24 reptile species found in the park, today there are only 9 amphibian and 11 reptile species known to occur. Some amphibians, such as the gray treefrog (*Hyla versicolor*) and chorus frog (*Pseudacris triseriata*), have disappeared altogether from Rock Creek Park. Species found within the park include the

spring peeper (*Hyla crucifer*), wood frog (*Rana sylvatica*), spotted salamander (*Ambystoma maculatum*), and red-backed salamanders (*Plethodon cinereus*) (NPS 2005a). Species identified in the park by the U.S. Geological Survey Northeast Amphibian Research and Monitoring Initiative includes the northern dusky salamander (*Desmognathus fuscus*), northern two-lined salamander (*Eurycea bislineata*), and northern red salamander (*Pseudotriton ruber ruber*) (Jung 2004). In addition to these amphibians, reptiles known to occur in the park include the northern ringneck snake (*Diadophis punctatus*), which is common. Eastern box turtles and larger snakes such as the black rat snake (*Elaphe obsoleta*) are much less common (NPS 2005a). Habitats in the park include springs, seeps, wetlands, and waterways for most frogs and salamanders. The Eastern box turtle, snakes, and spring peeper prefer moist forested areas near marshes, ponds, streams, or temporary pools.

Non-native Species

In addition to those plants and animals native to Rock Creek Park, the park also contains a number of non-native species. The dumping of landscaping materials is a principle way non-native plant species enter the park. They can have detrimental effects on vegetation by out competing native plants for light or water and eventually altering the vegetation communities in the park. The public most likely introduces non-native animals through intentional or accidental release into the park.

Invasive non-native plants seriously threaten the integrity of native habitats, including eastern deciduous forests, by aggressively displacing and killing native plants, reducing native habitats, and stifling forest regeneration. Non-native species populations have been slowly increasing over the past century or more and seem to have exploded within the last 30 years. The exotic species problem is particularly acute in urban parklands where the extensive edges and frequent human disturbances enhance opportunities for aggressive exotic plants to become established, such as at Rock Creek Park (NPS 2004a).

Inventories of park vegetation have found 286 non-native plant species within the park, 42 of which are classified as invasive non-native species that, unless controlled, are likely to spread and adversely affect native plant populations (2004a). These species vary widely in terms of their current and potential ecological effects. Some species are native within the eastern U.S. but were definitely planted in the park. Others are single plants of a non-native species that cannot reproduce in this climate. Some non-native species have naturalized, but will never cause damage to the ecosystem by displacing native species or changing the critical characteristics of the system. A few species are ecologically destructive when allowed to spread. Several factors influence the priority rank of a given plant species:

- Invasiveness, based on its life history
- Potential ecological harm
- Treatment Potential
- Discreteness of population

Based on literature searches and direct observation, the park's natural resource management staff identified 56 of the 286 species that seem to be negatively impacting the park's natural resources, or have the potential to do so. Those species identified in the draft exotic plant management plan (NPS 2004a) are listed in table 7 in order of priority ranking, which was based on both the feasibility of control and the adverse impact the plant is or could have.

TABLE 7: HIGHEST PRIORITY INVASIVE NON-NATIVE SPECIES AT ROCK CREEK PARK

Common Name	Scientific Name
Lesser Celandine	<i>Ranunculus ficaria</i>
Porcelain berry	<i>Ampelopsis brevipedunculata</i>
Oriental bittersweet	<i>Celastrus orbiculatus</i>
English ivy	<i>Hedera helix</i>
Kudzu	<i>Pueraria lobata</i>
Japanese maple	<i>Acer palmatum</i>
Winged burning bush	<i>Euonymus alatus</i>
Japanese knotweed	<i>Polygonum cuspidatum</i>
Privet	<i>Ligustrum species</i>
Japanese stiltgrass	<i>Microstegium vimineum</i>
Japanese barberry	<i>Berberis thunbergii</i>
Garlic mustard	<i>Alliaria petiolata</i>
Linden arrowwood	<i>Viburnum dilatatum</i>
Norway maple	<i>Acer platanoides</i>
Japanese honeysuckle	<i>Lonicera japonica</i>
Bamboo	bamboo
Canada thistle	<i>Cirsium arvense</i>
Winter creeper	<i>Euonymus fortunei</i>
Tree of heaven	<i>Ailanthus altissima</i>
Common periwinkle	<i>Vinca minor</i>
Mile a minute	<i>Polygonum perfoliatum</i>
Japanese snowball	<i>Viburnum plicatum</i>
Jetbead	<i>Rhodotypos scandens</i>
Multiflora rose	<i>Rosa multiflora</i>
Silvergrass	<i>Miscanthus sinensis</i>
Japanese spurge	<i>Pachysandra terminalis</i>
Chinese wisteria	<i>Wisteria sinensis</i>
White mulberry	<i>Morus alba</i>
Cinnamon vine	<i>Dioscorea batatas</i>
Yam-leaved clematis	<i>Clematis terniflora</i>
Wineberry	<i>Rubus phoenicolasius</i>
Goutweed	<i>Aegopodium podagraria</i>
Common burdock	<i>Arctium minus</i>
Amur honeysuckle	<i>Lonicera maackii</i>
Paper mulberry	<i>Broussonetia papyrifera</i>
Japanese hops	<i>Humulus japonicus</i>
Chocolate Vine	<i>Akebia quinata</i>
Autumn olive	<i>Elaeagnus umbellata</i>
Empress tree	<i>Paulownia tomentosa</i>
Siebold's viburnum	<i>Viburnum sieboldii</i>
Fuzzy deutzia	<i>Deutzia scabra</i>

Common Name	Scientific Name
Thorny elaeagnus	<i>Elaeagnus pungens</i>
Pear species	<i>Pyrus species</i>
Purpleheart grass	<i>Arthraxon hispidus</i>
Rose of Sharon	<i>Hibiscus syriacus</i>
Asiatic hawk's beard	<i>Youngia japonica</i>
Italian arum	<i>Arum italicum</i>
Hollyleaved barberry	<i>Mahonia aquifolium</i>
Mimosa	<i>Albizia julibrissin</i>
Gill over the ground	<i>Glechoma hederacea</i>
Cherry species	<i>Prunus species</i>
Creeping lilyturf	<i>Liriope spicata</i>
Beefsteak plant	<i>Perilla frutescens</i>
—	garden bulbs
Chinese elm	<i>Ulmus parvifolia</i>
Daylily	<i>Hemerocallis fulva</i>

Several non-native species of wildlife also occur in Rock Creek Park and are adversely affecting the park's natural resources. These species include free-roaming cats (*Felis catus*), starlings (*Sturnus vulgaris*), and the gypsy moth (*Lymantria dispar*). Free-roaming domestic cats are generally found near the park borders. Mitchell and Beck (1999) demonstrated that cats in such settings prey on local populations of songbirds, squirrels, and other small mammals and may reduce their numbers. Starlings compete with some cavity-nesting birds for nest sites. The gypsy moth has been present in the park for many years and, at times, has become sufficiently abundant to require aerial spraying to prevent deforestation and related impacts.

The effects of these and other non-native animals on native species are not fully known. They could be substantial, considering the small size of the natural areas of the park and the park's location within an urban setting. However, except for treatments of insect pests, no control efforts are currently in place for non-native animal species.

Glover-Archbold Park and Whitehaven Parkway

The soils found in the Glover-Archbold Park and Whitehaven Parkway units consist mainly of loam, with dark brown loam comprising the upper 2 inches and lighter, yellow loam underneath. The subsoil is about 19 inches thick and is also comprised of loam. Permeability in these soils is moderate and the available water capacity is high. These soils have the potential for high erosion rates (NPS 2002d).

Glover-Archbold Park, including Battery Kemble, supports 183 acres of deciduous forest, successional meadow and a riparian zone along foundry branch, which is the stream that traverses the park along its long axis (Engelhardt 2005). The Glover-Archbold Park and Whitehaven Parkway units are connected properties that share similar characteristics in terms of flora and fauna. A vascular plant study was conducted for these units in April, 2005. Research has been done regarding Glover-Archbold Park, which adjoins Whitehaven Parkway near Georgetown University. This study found that the park contains a variety of vegetation types, both native and non-native. Much of this area can be characterized as dense

forest with trees such as cottonwoods (*Populus deltoides*), eastern sycamores (*Platanus occidentalis*), northern red oaks, tulip trees, and white oaks, as well as shrubs, and other vegetation (Georgetown University 2005). Studies conducted on a portion of Whitehaven Parkway in 2002 identified forested areas of the property as beech–tulip poplar variant of beech – white oak /mayapple. Shrub species identified in this area included blackberry and porcelain berry (*Ampelopsis brevipedunculata*) (NPS 2002d).

The University of Maryland conducted a study in the spring of 2005 which determined that the most abundant plant species in these areas were the Indian turnip (*Arisaema triphyllum*), American beech (*Fagus grandifolia*), English ivy (*Hedera helix*), northern spicebush (*Lindera benzoin*), American tulip tree (*Liriodendron tulipifera*), black cherry tree (*Prunus serotina*), and southern arrowwood (*Viburnum dentatum*) (Engelhardt 2005). Multiple wetland plant species are evident near the stream including cattails (*Typha angustifolia*) and sedges (*Cyperus* sp.) (NPS 2002d).

Wildlife species detected in the deciduous forest and shrubland habitats are comparable to those found in Rock Creek Park. In these units, surveys of the area by Georgetown University have documented 5,000 invertebrate, 40 bird, 6 amphibian, 4 reptile, and 10 mammal species (Georgetown University 2005). Surveys have also identified the northern dusky salamander (*Desmognatus fuscus fuscus*), crayfish (*Orconectes* spp.), and macroinvertebrates including Trichoptera (order), Philopotanmidae (family) *Chimnera* (genus), Diptera nematocera Tepulidae *Prinocera*, and Odonata Calopterygidea *Calopteryx* (NPS 2002d).

Non-native Species

Glover-Archbold Park and Whitehaven Parkway contain numerous non-native plant species including: Asiatic bittersweet (*Lonicera maackii*), bamboo (*Bambusa* spp.), English ivy (*Hedera helix*), garlic mustard (*Alliaria petiolata*), Japanese honeysuckle (*Lonicera japonica*), lesser celandine (*Ranunculus ficaria* L), multiflora rose (*Rosa multiflora*), privet (*Ligustrum japonicum*), turf-lily (*Lilium philadelphicum*), and wineberry (*Rubus phoenicolasius*) (Georgetown University 2005). The University of Maryland 2005 vascular plant study found 51 species of introduced and non-native plants in these units (Engelhardt 2005). Similar to Rock Creek Park and Rock Creek and Potomac Parkway, non-native wildlife species that occur in Glover-Archbold Park and Whitehaven Parkway include free roaming cats (*Felis silvestris catus*), starlings (*Sturnus vulgaris*), and the gypsy moth (*Lymantria dispar*). Free-roaming domestic cats are particularly found near the park's borders.

Circles and Other Small Parcels

The traffic circles and other small parcels, such as small triangle parks and other parcels less than 0.25 of an acre managed by Rock Creek Park, are located throughout the city in highly urbanized areas. Buildings and roadway networks surround all these areas. Areas that have not been urbanized include parks, playgrounds, vacant lots, isolated tracts of wooded lands, and yards and open space between buildings (NRCS 1975).

Vegetation types in these areas are characterized mainly by maintained lawn with sparse landscaped shrubs and trees that are typical of an urbanized area. These areas are generally small (less than 0.25 acres) and are located in heavily developed urban areas, often serving as traffic calming devices. Wildlife likely to occur in these areas would include species adapted to disturbed habitats associated with an urban environment such as domestic pets, gray squirrel, raccoon, opossum, and eastern chipmunk.

Non-native Species

The traffic circles and other small parcels are primarily maintained lawns and may contain some ornamental varieties that are not native to the area. Similar to Rock Creek Park and Rock Creek and Potomac Parkway, non-native wildlife species that occur in Rock Creek Park include free-roaming cats, starlings, and the gypsy moth. Norway rats (*Rattus norvegicus*) are also problematic in some of these small parcels and traffic circles, especially along 16th Street.

SPECIES OF SPECIAL CONCERN

Rock Creek Park and Potomac Parkway

Providing the only large tract of forested land in the District, the park is home to many species of special concern. One species found in the park is federally listed as endangered (NPS 2005a). While the majority of these species are not federally listed, they have been identified by the park, District of Columbia, or neighboring Maryland and Virginia as in decline, are only found in specific habitats, or have small isolated populations and are of special concern to Rock Creek Park. Because of the habitat value provided by Rock Creek Park, many of these species could be found in the park. Habitats preferred by these species generally include springs, seeps, wetlands, and waterways and/or associated moist forested areas. Table 8 lists those species of greatest conservation need which could occur in the park.

TABLE 8: SPECIES OF GREATEST CONSERVATION NEED WITHIN THE DISTRICT OF COLUMBIA

Common Name	Scientific Name	Status within Washington, D.C.
Mammal		
Eastern small-footed myotis	<i>Myotis leibii</i>	critically imperiled
Gray fox	<i>Urocyon cinereoargenteus</i>	vulnerable
Northern river otter	<i>Lutra Canadensis</i>	critically imperiled
Southern bog lemming	<i>Synaptomys cooperi</i>	vulnerable
Southern flying squirrel	<i>Glaucomys volans</i>	secure
Virginia opossum	<i>Didelphis Virginiana</i>	secure
Allegheny woodrat	<i>Neotoma magister</i>	possibly extirpated
American mink	<i>Mustela vison</i>	critically imperiled
Eastern chipmunk	<i>Tamias striatus</i>	secure
Eastern cottontail	<i>Sylvilagus floridanus</i>	secure
Eastern red bat	<i>Lasiurus borealis</i>	secure
Reptile		
Common musk turtle	<i>Sternotherus odoratus</i>	secure
Bog turtle	<i>Clemmys muhlenbergii</i>	presumed extirpated
Corn snake	<i>Elaphe guttata guttata</i>	undetermined
Eastern box turtle	<i>Terrapene carolina</i>	vulnerable
Eastern garter snake	<i>Thamnophis sirtalis</i>	secure
Eastern hognose snake	<i>Heterodon platirhinos</i>	possibly extirpated
Eastern mud turtle	<i>Kinosternon subrubrum</i>	apparently secure
Spotted turtle	<i>Chrysemys guttata</i>	critically imperiled
Eastern ribbon snake	<i>Thamnophis sauritus</i>	secure
Eastern worm snake	<i>Carphophis amoenus</i>	secure

Common Name	Scientific Name	Status within Washington, D.C.
	<i>amoenus</i>	
Eastern fence lizard	<i>Sceloporus undulates</i>	possibly extirpated
Five-lined skink	<i>Eumeces fasciatus</i>	secure
Northern black racer	<i>Coluber constrictor constrictor</i>	secure
Northern brown snake	<i>Storeria dekayi</i>	secure
Northern copperhead	<i>Agkistrodon contortrix</i>	critically imperiled
Eastern painted turtle	<i>Chrysemys picta picta</i>	secure
Northern ringneck snake	<i>Didophis punctatus edwardsii</i>	secure
Queen snake	<i>Regina septemvittata</i>	critically imperiled
Eastern redbelly turtle	<i>Pseudemys rubriventris</i>	secure
Rough green snake	<i>Opheodrys aestivus</i>	secure
Northern scarlet snake	<i>Cemophora coccinea copei</i>	possibly extirpated
Timber rattlesnake	<i>Crotalus horridus</i>	possibly extirpated
Wood turtle	<i>Clemmys insculpta</i>	possibly extirpated
Amphibian		
American Toad	<i>Bufo americanus</i>	medium population abundance
Bullfrog	<i>Rana catesbeiana</i>	medium population abundance
Fowler's Toad	<i>Bufo fowleri</i>	medium population abundance
Marbled Salamander	<i>Ambystoma opacum</i>	low population abundance
Eastern Mud Salamander	<i>Pseudotriton m. montanus</i>	low population abundance
Northern Cricket Frog	<i>Acris crepitans</i>	low population abundance
Northern Dusky Salamander	<i>Desmognathus fuscus</i>	low population abundance
Northern Spring Peeper	<i>Hyla crucifer</i>	medium population abundance
Northern Two-lined Salamander	<i>Eurycea bislineata</i>	medium population abundance
Pickerel Frog	<i>Rana palustris</i>	medium population abundance
Northern Red Salamander	<i>Pseudotriton ruber ruber</i>	low population abundance
Redback Salamander	<i>Plethodon cinereus</i>	medium population abundance
Red Spotted Newt	<i>Notophthalmus viridescens</i>	low population abundance
Spotted Salamander	<i>Ambystoma maculatum</i>	medium population abundance
Upland Chorus Frog	<i>Pseudacris feriarum feriarum</i>	low population abundance
Wood Frog	<i>Rana sylvatica</i>	low population abundance
Fish		
American shad	<i>Alosa sapidissima</i>	severely reduced, but rebounding
Greenside darter	<i>Etheostoma blennioides</i>	low population abundance
Silver jaw minnow	<i>Ericymba buccata</i>	low population abundance
Warmouth	<i>Lepomis gulosus</i>	low population abundance
Alewife	<i>Alosa pseudoharengus</i>	low population abundance, currently stable
Blueback herring	<i>Alosa aestivalis</i>	low population abundance, currently stable
Atlantic sturgeon	<i>Acipenser oxyrinchus</i>	Federal status: threatened, extirpated from District of

Common Name	Scientific Name	Status within Washington, D.C.
		Columbia
American eel	<i>Anguilla rostrata</i>	low population abundance
Central stoneroller	<i>Campostoma anomalum</i>	low population abundance
Bowfin	<i>Amia calva</i>	extremely low population abundance
Hickory shad	<i>Alosa mediocris</i>	rebounding

The Hay's Spring amphipod (*Stygobromus hayi*) is federally listed as endangered. The Hay's Spring amphipod ranges from one-half to 1-inch long. It is colorless, eyeless, and has adaptive hairs for sensing currents and food. It has a life span of 8 years or more and a low reproductive rate. *Stygobromus* amphipods spend the majority of their lives in groundwater below the surface, feeding on detritus (NPS 2005a). Only one Hay's Spring amphipod population of unknown size is known and it occurs within Rock Creek Park. The animal has been collected from a single spring at the south end of National Zoological Park, Washington, D.C. and at four other locations within Rock Creek Park, which adjoins the National Zoo (Pavek 2002). The spring in which the amphipod is found connects to an underground aquifer. The small size of the species' population and habitat, as well as the fragile nature of the habitat, makes the species vulnerable to flooding, isolated acts of vandalism, and construction or maintenance accidents that might harm or destroy the crustacean's habitat (USFWS 1982). Amphipods are subject to a number of predators when they are at surface springs, such as stonefly larvae and salamanders, but probably have few if any predators below the surface.

Kenk's amphipod, also known as the Rock Creek groundwater amphipod (*Stygobromus kenki*), was identified in park springs (NPS 1997a). Kenk's amphipod is not currently listed under the Endangered Species Act, but it is under consideration by the U.S. Fish and Wildlife Service as a candidate species for future listing. In addition, three other *Stygobromus* species of amphipods that are listed by the state of Maryland as rare or uncommon have been located in or near the park (Maryland Department of Resources 2003). Researchers from the U.S. Geological Survey Northeast Amphibian Research and Monitoring Initiative identified 35 springs and seeps in the park (Jung 2004). All of these potentially provide habitat for groundwater amphipods. Threats to groundwater amphipods include alterations of groundwater flows, groundwater pollution, loss of detritus as a food source, and disturbance of spring sites. Common pollution problems for amphipods are nitrates in fertilizers (which result in groundwater oxygen depletion), pesticides, and petroleum leaking from underground storage tanks. The relative abundance of rare amphipods in the park has been attributed to the long-term protection of groundwater quality afforded by the park.

Rare species of plants are also identified by the District of Columbia, Maryland, and Virginia. The Virginia species are not known in the park and it is not likely that they will occur because of the separation from Virginia by the Potomac River, as well as the presence of different habitats. However, there are several plant species that have been or are currently listed as rare by Maryland Department of Natural Resources that have been documented (although rare) in Rock Creek Park. These plants, their state listing status, and their habitat preferences are listed in table 9 (K. Ferebee, NPS, pers. comm., Oct. 29, 2007).

Several animal species with known occurrences in Rock Creek Park are listed as rare or uncommon by Maryland, and are shown in table 10.

TABLE 9: RARE PLANTS OF MARYLAND DOCUMENTED IN ROCK CREEK PARK

State Listed Rare Species			
Latin Name	Common Name	Rank	Habitat
<i>Antennaria solitaria</i>	Single-headed pussytoes	S1-DC; S2-MD	Rich woods and clearings
<i>Arabis hirsuta</i>	Hairy rock cress	S1S2-VA; ?-DC	Moist to dry rocky woods and ledges
<i>Arisaema dracontium</i> *	Green dragon arum	S1S3-DC	Low, rich soils, along streams
<i>Aristolochia serpentaria</i>	Virginia snakeroot	SX-DC	Stream banks, floodplain, bottomland
<i>Aster infirmus</i>	Cornel-leaved aster	S1S3-DC; S3-MD	Deciduous, inland, upland woodlands
<i>Carex hirtifolia</i>	Pubescent sedge	S1-DC; S3-MD	Dry to moist woods and fields
<i>Castanea dentata</i>	American chestnut	S1S2-DC; S2S3-MD	Well-drained forest
<i>Chrysogonum virginianum</i>	Gold star; green and gold	S?-DC; S3-MD	Rich woods, moist well drained to drier soils
<i>Coreopsis verticillata</i>	Whorled coreopsis	S1S3-DC; S3-MD	Dry soils, open woodlands/roadsides
<i>Cyperus lancastriensis</i>	Lancaster sedge	S1S3-DC; SU-MD	Dry-mesic soils, floodplains, river banks
<i>Kyllinga pumila</i>	Low kyllinga sedge	S1-DC/MD	Damp grasslands, shorelines, ditches
<i>Desmodium glutinosum</i> *	Pointed-leaved tick-trefoil	S?-DC	Dry, rocky woods
<i>Eupatorium altissimum</i>	Tall boneset	S?-DC; S3-MD	Woods, thickets, favors disturbed areas
<i>Gymnocladus dioica</i>	Kentucky coffee-tree	S1-MD	Bottomlands, rich soil along streams/rivers
<i>Juglans cinerea</i>	Butternut	S1-DC; S2S3-MD	Fertile woods
<i>Lycopodium clavatum</i>	Common clubmoss	S1S3-DC	Dry to moist woods or road banks
<i>Maianthemum canadense</i>	Two-leaved solomon's-seal	S1S3-DC	Moist to mesic humus rich soils
<i>Melica mutica</i>	Narrow melic grass	S1S2-DC; S1-MD	Dry, open woodlands
<i>Monarda clinopodia</i>	Basil balm	S1S3-DC; S3-MD	Low woods and thickets
<i>Passiflora lutea</i>	Yellow passionflower	S1-DC	Low rocky moist woods; thickets
<i>Phyllanthus caroliniensis</i>	Carolina leaf-flower	S1S3-DC; S3-MD	Poor, dry soils
<i>Physalis virginiana</i>	Virginia ground cherry	S1S3-DC; S3-MD	Dry; upland woods, fields
<i>Pinus pungens</i>	Table mountain pine	S1-DC	Appalachians and foothills
<i>Pyrola elliptica</i>	Elliptic shinleaf	SH-DC; S2-VA	Dry or moist woods
<i>Quercus imbricaria</i>	Shingle oak	S1S3-DC	Fertile woods
<i>Quercus lyrata</i> *	Overcup oak	SE?-DC	Coastal plains, swamp forest
<i>Rudbeckia fulgida</i>	Orange coneflower	S1S3-DC; S3-MD	Dry to wet soils, usually in shade
<i>Sagina decumbens</i> *	Decumbent pearlwort	S1S3-DC	Wet places or dry, sandy soils
<i>Sagittaria longirostra</i>	Long-beaked arrowhead	S1-DC; SU-MD	Wet areas

State Listed Rare Species			
Latin Name	Common Name	Rank	Habitat
<i>Scutellaria serrata</i>	Snowy skullcap	S1S3-DC; S3-MD	Rich, upland woods
<i>Silphium trifoliatum</i>	Three-leaved cup plant	S1-DC; S3-MD	Open areas, woodlands, and thickets
<i>Solidago hispida</i>	Hispid goldenrod	S1-DC; SH-MD	Dry soils of open woods and rocky slopes
<i>Spiranthes tuberosa</i>	Little ladie's tresses	S1S3-DC; S3-MD	Dry woodlands and sandy soils
<i>Zizia aurea</i>	Golden alexanders	S1S3; S3-MD	Ditch margins, moist meadows, woods

* Denotes species that have been delisted by U.S. Fish and Wildlife Service or Maryland Department of Natural Resources

Maryland (MD) Status and rank definitions:

S1 = Highly State rare. Critically imperiled in Maryland because of extreme rarity (typically 5 or fewer estimated occurrences or very few remaining individuals or acres in the State) or because of some factor(s) making it especially vulnerable to extirpation.

S2 = State rare. Imperiled in Maryland because of rarity (typically 6 to 20 estimated occurrences or few remaining individuals or acres in the State) or because of some factor(s) making it vulnerable to becoming extirpated. Species with this rank are actively tracked by the Heritage & Biodiversity Conservation Programs.

S3 = Watch List. Rare to uncommon with the number of occurrences typically in the range of 21 to 100 in Maryland. It may have fewer occurrences but with a large number of individuals in some populations, and it may be susceptible to large-scale disturbances. Species with this rank are not actively tracked by the Heritage & Biodiversity Conservation Programs.

SH = Historically known from Maryland, but not verified for an extended period (usually 20 or more years), with the expectation that it may be rediscovered.

SX = Believed to be extirpated in Maryland with virtually no chance of rediscovery.

SU = Possibly rare in Maryland, but of uncertain status for reasons including lack of historical records, low search effort, cryptic nature of the species, or concerns that the species may not be native to the State. Uncertainty spans a range of 4 or 5 ranks as defined above. These species have been de-listed by the state of Maryland but they are still considered rare in the park.

Virginia (VA) and DC rank definitions are similar to those used by Maryland.

TABLE 10: RARE OR UNCOMMON ANIMALS OF MARYLAND

Common Name	Scientific Name	Maryland Status	Native Habitat
Appalachian spring snail	<i>Fontigens bottimeri</i>	Rare or uncommon	Freshwater seeps
Gray petaltail dragonfly	<i>Tachopteryx thoreyi</i>	Rare or uncommon	Forests, breed in seeps
Olive-sided flycatcher	<i>Contopus cooperi</i>	Maryland endangered	Within coniferous forest biome, most often associated with forest openings, forest edges near natural openings) or human-made openings or open to semi-open forest stands
Mourning warbler	<i>Oporornis philadelphia</i>	Maryland endangered	Thickets and semi-open areas with dense shrubs
Blackburnian warbler	<i>Dendroica fusca</i>	Maryland threatened	Mature coniferous woodlands or mixed woodlands, especially ones containing spruce and hemlocks
Nashville warbler	<i>Vermivora ruficapilla</i>	Maryland species of concern	Open mixed woods and bog habitats
Yellow-crowned night-heron	<i>Nyctanassa violacea</i>	Rare	Riparian
Cerulean warbler	<i>Dendroica cerulean</i>	Proposed Federal Listing	Mature deciduous forests
Bicknell's thrush	<i>Catharus bicknelli</i>	Proposed Federal Listing	Dense balsam fir (<i>Abies balsamea</i>) and red spruce (<i>Picea rubens</i>) forests

Species identified as rare by the Maryland Department of Natural Resources that have been known to be found within the park include the Appalachian spring snail (*Fontigens bottimeri*), gray petaltail dragonfly (*Tachopteryx thoreyi*), and five avian species.

In its Wildlife Action Plan the District of Columbia has identified a number of species of greatest conservation need within the District (District of Columbia 2006). These species may also appear within Rock Creek Park.

The NPS is not under any legal obligation to protect these plant or animal species. However, NPS policy and management actions include maintaining these uncommon native species as part of the park's natural heritage (NPS 2005a).

Glover-Archbold Park and Whitehaven Parkway

Species of special concern found in Glover-Archbold Park and Whitehaven Parkway would be expected to be the same as those found in Rock Creek and the Rock Creek and Potomac Parkway. A number of sensitive plant species have the potential to occur on the property based on the presence of suitable habitat. Based on previous recorded occurrences by the NPS for nearby Rock Creek Park, 15 sensitive plant species were determined to have a low to moderate potential to occur in Glover-Archbold Park. Two of these species are listed as Maryland state endangered: shellbark hickory (*Carya laciniosa*) and striate agrimony (*Agrimonia striata*). The others are listed by Maryland at various levels of sensitivity. These species include the following: golden Alexander (*Ziza aurea*), cornel-leaved aster (*Aster infirmus*), whorled coreopsis, boneset (*Eupatorium altissimum*), sheepberry (*Viburnum lentago*), Carolina leaf flower (*Phyllanthus caroliniensis*), chestnut, basil balm (*Monardia clinopodia*), snowy skullcap (*Scutellaria serrata*), umbrella tree (*Magnolia tripedala*), smooth ground cherry (*Physalis virginiana*), little lady's tresses (*Spiranthes tuberosa*), and hairy-leaved sedge (*Carex hirtifolia*). Of the 15 species listed above, none are known to occur on or adjacent to the subject property. None of these plant species are federally listed (NPS 2002d).

Circles and Other Small Parcels

These areas contain mainly maintained lawns and would therefore not be expected to support species of special concern found in Rock Creek Park.

AVIAN SPECIES

WTF may have an effect on avian species, particularly migratory birds. Rock Creek Park is extremely attractive to both large numbers of neotropical migrants and uncommon breeding species. In fact, this upland area is considered the most important migrant land bird resting and feeding area in the District of Columbia.

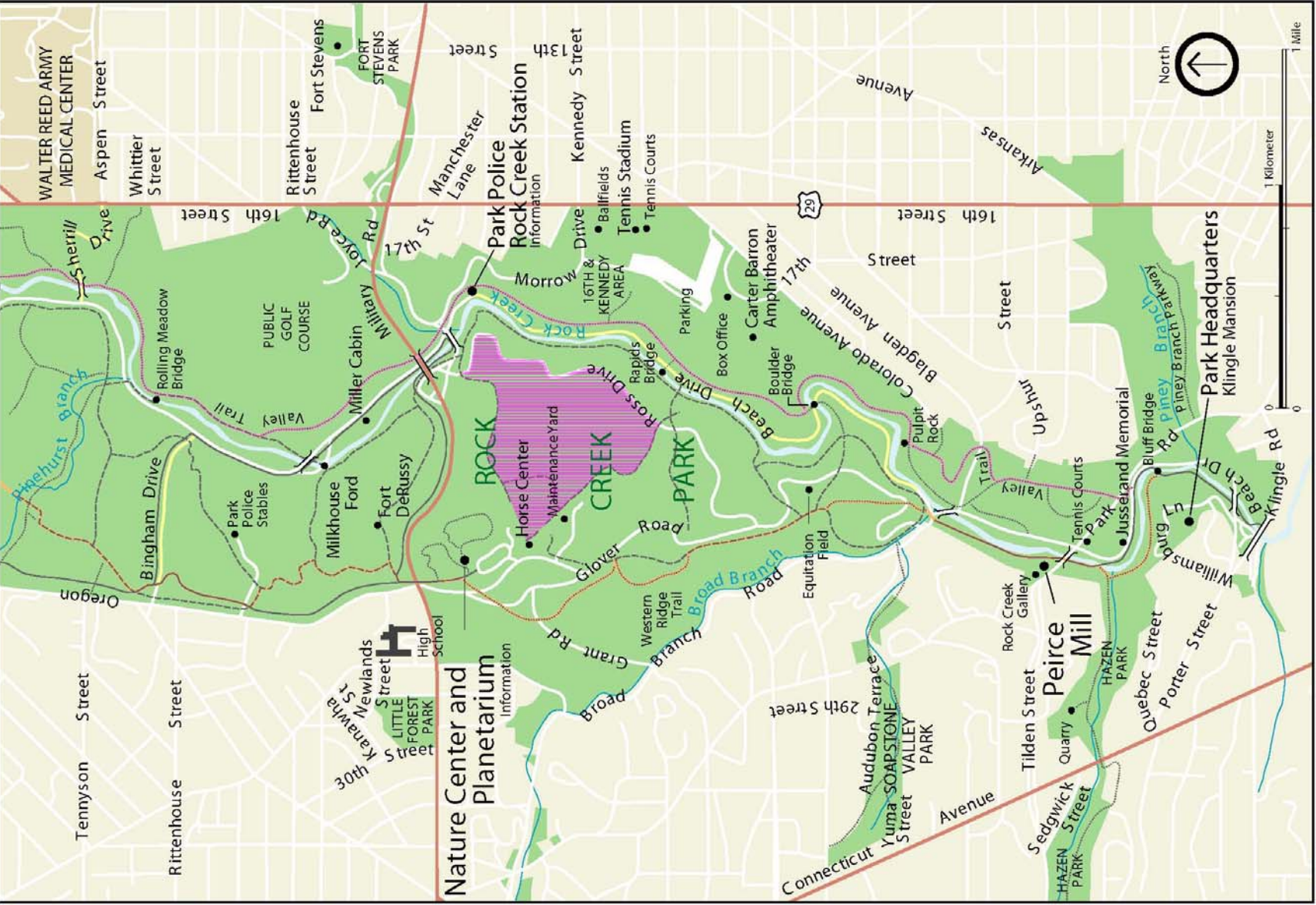
Neotropical migrants are those avian species that breed in the United States and Canada and winter in Mexico, Central America, South America, or the Caribbean Islands (Smithsonian Migratory Bird Center 2003). The park's species list includes neotropical migrants. Ten species of flycatchers, 6 species of vireos, 7 species of thrushes, and 35 species of warblers have been documented based on observer information in the District.

Rock Creek Park and Rock Creek and Potomac Parkway

As a large expanse of open space in the highly urbanized Washington, D.C. area, the park provides habitat for migrant, breeding, resident, and wintering birds. The ridge of forested land that borders the west bank of Rock Creek between Broad Branch and Military Roads is the best warbler “trap” in the District (Wilds 1992). The combination of north-south ridge of forested land, its location on the Fall line dividing the Piedmont and Coastal Plain physiographic regions, as well as its function as open space in the center of an urban area, serves to concentrate migrant land birds during spring and fall (Wilds 1992). Approximately 180 species of breeding or migrating birds have been documented in Rock Creek Park (MacKiernan 2003). Most are migrants or seasonal visitors. Rock Creek Park is recognized by the National Audubon Society and the American Bird Conservancy as an important birding area for its exceptional diversity of bird species during migration (Audubon Maryland-D.C. 2007).

Breeding species are those that spend the nesting season in Rock Creek Park and have been the focus of a breeding bird census conducted by volunteers since 1948. The breeding bird census area comprises a triangular section of approximately 65 acres between Glover Road, Military Road, and Ross Drive (see figure 10; Ford, B, NPS, pers. comm., Jan. 14, 2003). Volunteers observe and compile species heard and seen each year from mid-March to early July. Data compiled from the volunteer surveys for 1993 through 1998 and 2001 through 2002 identified summer resident or resident potential breeding species (see appendix A).

Summer resident/potential breeding species include red-eyed vireo (*Vireo olivaceus*), Acadian flycatcher (*Empidonax virens*), great crested flycatcher (*Myiarchus crinitus*), eastern phoebe (*Sayornis phoebe*), eastern wood-pewee (*Contopus sordidulus*), blue-gray gnatcatcher (*Poliophtila caerulea*), veery (*Catharus fuscescens*), wood thrush (*Hylocichla mustelina*), gray catbird (*Dumetella carolinensis*), ovenbird (*Seiurus aurocapillus*), and scarlet tanager (*Pirangia olivacea*). Species found as year-round residents/breeding species (NPS n.d., National Audubon Society n.d.a) include: great horned (*Bubo virginianus*), eastern screech (*Otus asio*), and barred owls (*Strix varia*), red-shouldered hawk (*Buteo lineatus*), northern flicker (*Colaptes auratus*), red-bellied (*Melanerpes carolinus*), downy woodpecker (*Picoides pubescens*), hairy woodpecker (*Picoides villosus*) and pileated woodpeckers (*Dryocopus pileatus*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), tufted titmouse (*Parus bicolor*), Carolina chickadee (*Poecile carolinensis*), white-breasted nuthatch (*Sitta carolinensis*), Carolina wren (*Thryothorus ludovicianus*), American robin (*Turdus migratorius*), northern cardinal (*Cardinalis cardinalis*), and song sparrow (*Melospiza melodia*). Eastern screech owl, barred owl, and red-shouldered hawk are all species of concern in the Washington, D.C. area (S. Salmons, NPS, pers. comm., Jan. 29, 2003). Many of the breeding birds found within Rock Creek Park nest on or near the ground. Common ground nesters include the ovenbird, worm-eating warbler (*Helminthos vermivorus*), Louisiana waterthrush (*Seiurus motacilla*), and American woodcock (*Scolopax minor*). Other species nest in the shrub layer; these include the northern cardinal, gray catbird, Acadian flycatcher, mockingbird (*Mimus polyglottos*), wood thrush, Carolina wren, white-eyed vireo (*Vireo griseus*), American robin, chipping sparrow (*Spizella passerina*), American goldfinch, and mourning dove (*Zenaidura macroura*). The song sparrow, brown thrasher (*Toxostoma rufum*), rufous-sided towhee (*Pipilo erythrophthalmus*), veery, and common yellowthroat (*Geothlypis trichas*), nest both on the ground and in the shrub layer (K. Ferebee, NPS, pers. comm., N. VanDyke, The Louis Berger Group, Nov. 1, 2007).



Rock Creek Park

Washington, DC

Breeding Bird Census Area



United States Department of the Interior/National Park Service WASO/January '03/0000-00000

Wintering and resident species are surveyed annually during the Washington, D.C. National Audubon Christmas Bird Count. Volunteers count all species and individuals of birds encountered in a 15-mile diameter circle on one day. A portion of the Washington, D.C. circle covers part of Rock Creek Park. This area is divided into sections that include areas of Rock Creek Park such as the Nature Center, Carter Barron Amphitheater, the maintenance yard, and tennis center (B. Yeaman, NPS, pers. comm., Jan. 9, 2003). Species identified during the Christmas Bird Counts averaged 27 species per year for the Nature Center section and 21 species per year for the Carter Barron section (National Audubon Society n.d.). Some of the species commonly found in the Nature Center and Carter Barron sections during the Christmas Bird Count include resident species such as red-tailed hawk (*Buteo jamaicensis*), red-bellied woodpecker, downy woodpecker, blue jay, tufted titmouse, Carolina chickadee, Carolina wren, and northern mockingbird (*Mimus polyglottos*). Species that spend the winter and are present on the Audubon Christmas Count (Carter Barron and Nature Center sections) in most years include brown creeper (*Certhia americana*), golden-crowned kinglet (*Regulus satrapa*), dark-eyed junco (*Junco hyemalis*), and white-throated sparrow (*Zonotrichia albicollis*).

Avian Species of Concern

No federally endangered or threatened avian species using Rock Creek Park were identified in reviewing available information (USFWS 2003). The District listed sensitive avian species, including several species of raptors, occurring in the area of Rock Creek Park (see table 11). The NPS has prepared a list of sensitive avian species documented to occur in the area of the park around the two existing WTF based on the D.C. Natural Heritage Program database.

TABLE 11: AVIAN SPECIES OF GREATEST CONSERVATION NEED WITHIN THE DISTRICT OF COLUMBIA

Common Name	Scientific Name	Status within Washington D.C.
Bobolink	<i>Dolichonyx oryzivorus</i>	Undetermined
Acadian flycatcher	<i>Empidonax virescens</i>	passage migrant
American bittern	<i>Botaurus lentiginosus</i>	local migrant
American black duck	<i>Ana rubripes</i>	Undetermined
American woodcock	<i>Scolopax minor</i>	Undetermined
Bald eagle	<i>Haliaeetus laucocephalus</i>	migrant and breeder
Black-crowned night-heron	<i>Nycticorax nycticorax</i>	migrant and breeder
Broad-winged hawk	<i>Buteo platypterus</i>	Imperiled
Brown creeper	<i>Certhia americana</i>	resident, local migrant, breeder
Brown thrasher	<i>Toxostoma rufum</i>	Vulnerable
Cerulean warbler	<i>Dendroica cerulean</i>	Undetermined
Chimney swift	<i>Chaetura pelagica</i>	Secure
Wilson's snipe	<i>Gallinago delicata</i>	Undetermined
Eastern meadowlark	<i>Sturnella magna</i>	critically imperiled
Eastern towhee	<i>Pipilo erythrophthalmus</i>	Secure
Field sparrow	<i>Spizella pusilla</i>	Imperiled
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Undetermined
Great horned owl	<i>Bubo virginianus</i>	Imperiled
Yellow-crowned night heron	<i>Nyctanassa violacea</i>	highly rare

From 10 years of migratory bird censuses documents the presence of 33 of 34 warblers found in the northeastern United States in Rock Creek Park. As a group, warblers are of concern because their numbers have been dropping, with sharp declines for some species, throughout the past two decades. Warblers seen in the park include the cerulean warbler, which has been proposed for listing as endangered or threatened by the U.S. Fish and Wildlife Service. Bicknell's thrush (*Catharus bicknelli*), another species that has been proposed for listing, also has been detected in spring migratory censuses (Cooper 1999).

A number of Maryland state-designated threatened, endangered, or other concern species have been documented in Rock Creek Park during migration. These include the olive-sided flycatcher (*Contopus cooperi*) (Maryland endangered), Blackburnian warbler (*Dendroica fusca*) (Maryland threatened), mourning warbler (*Oporornis philadelphia*) (Maryland endangered), and the Nashville warbler (*Vermivora ruficapilla*) (Maryland species of concern) (Cooper 2003). The yellow crowned night heron (*Nycticorax nycticorax*), considered rare by the state of Maryland, is also known to occur in the park.

Other species identified on the Natural Heritage database include probable breeding and/or nesting species that may occur within the park. These include broad-winged hawk (*Buteo platypterus*), American redstart (*Setophaga ruticilla*), cedar waxwing (*Bombycilla cedrorum*), great horned owl (*Bubo virginianus*), yellow-billed cuckoo (*Coccyzus americanus*), Louisiana waterthrush (*Seiurus motacilla*), cerulean warbler (*Dendroica cerulea*), yellow warbler (*Dendroica petechia*), and worm-eating warbler (*Helmitheros vermivorus*).

The National Audubon Society published a Watch List 2002 that categorizes avian species into red, yellow, and green lists based on severity of threats and population decline (National Audubon Society n.d.). A red-listed species is defined as one that is declining rapidly and facing major conservation threats; the golden-winged warbler is a red-listed species. Yellow-listed species are those with populations declining at a rate less than those in the red category. Yellow-listed species include the blue-winged warbler (*Vermivora pinus*), bay-breasted warbler (*Dendroica castanea*), Canada warbler (*Wilsonia canadensis*), Kentucky warbler (*Oporornis formosus*), prairie warbler (*Dendroica discolor*), prothonotary warbler (*Protonotaria citrea*), olive-sided flycatcher (*Contopus cooperi*), willow flycatcher (*Empidonax traillii*), and wood thrush (*Hylocichla mustelina*). All of the species mentioned above have been observed as migrants in Rock Creek Park (Janni 1999; Cooper 1999). Wood thrush is the only species on the Audubon Watch yellow list positively identified as a breeding species based on observations of fledged young during 2001 surveys in Rock Creek Park (NPS n.d.a). Worm-eating warbler, another yellow-listed species, was found in 1993 but has not been recorded since. Green-listed species are declining at a rate less than those of the red-and yellow-listed species.

Glover-Archbold Park and Whitehaven Parkway

Avian species found in Glover-Archbold Park and Whitehaven Parkway would be similar to those found in Rock Creek Park and the Rock Creek and Potomac Parkway. In 2002, NPS conducted a land exchange assessment for this area. This assessment detected the red-tailed hawk, pileated woodpecker, northern cardinal, song sparrow, Carolina chickadee, and American crow in the deciduous forest in the park (NPS 2002d). There has been a Breeding Bird Census Area established here since 1959.

Avian Species of Concern

No federal or state-listed avian species were detected during the NPS 2002 survey of this area. The Maryland "sensitive" dark-eyed junco, and red-breasted nuthatch were detected. These species are considered rare or sensitive only during their breeding seasons. The park contains potentially suitable habitat for the Nashville warbler, a species "in need of conservation" in the state of Maryland. Sensitive

species with the potential to occur on the property include: sharp skinned hawk (*Accipiter striatus*), whip-poor-will (*Caprimulgus vociferous*), common nighthawk (*Chordeilis minor*), purple finch (*Carpodacus purpureus*), black-throated blue warbler (*Dendroica caerulescens*), winter wren (*Troglodytes troglodytes*), and hermit thrush (*Catharus guttatus*) (NPS 2002d).

Circles and Other Small Parcels

Species found in traffic circles and other small parcels would be similar to those found in Rock Creek Park and the Rock Creek and Potomac Parkway. However, these areas are primarily maintained lawn and do not provide much habitat for these types of species. Because they are located in urban areas with a high level of disturbance and do not have the appropriate habitat, they do not provide habitat or support for avian species.

AIR QUALITY

Rock Creek Park is located in an area classified by the U.S. Environmental Protection Agency (EPA) as moderate non-attainment for ozone and non-attainment for particulate matter of 2.5 microns diameter or less (EPA 2007b). Pollutant emissions resulting from the construction, and operation and maintenance of WTF could create increases in emissions that could impact local residents and park visitors. When considering the affected environment for air quality under this WTF plan/EA, regional air quality conditions, as well as emissions sources from the existing WTF, were considered.

The EPA defines ambient air as “that portion of the atmosphere, external to buildings, to which the general public has access” (40 CFR Part 50). In compliance with the 1970 Clean Air Act and the 1977 and 1990 *Clean Air Act* Amendments, the EPA has promulgated national ambient air quality standards and regulations. The standards were enacted for the protection of the public health and welfare, allowing for an adequate margin of safety. To date, the agency has issued standards for six criteria pollutants: carbon monoxide (CO), sulfur dioxide (SO₂), particles with a diameter less than or equal to a nominal 10 micrometers (PM₁₀), particles with a diameter less than or equal to a nominal 2.5 micrometers (PM_{2.5}), ozone (O₃), nitrogen dioxide (NO₂), and lead (Pb). Each state and locality has the primary responsibility for air pollution prevention and control. Areas that do not meet national standards are called non-attainment areas.

The national ambient air quality standards are classified under two standards, which when exceeded have adverse effects on human health, and secondary standards, which can cause health and property damage if exceeded. Under the *Clean Air Act* and amendments, local air pollution control agencies have the authority to adopt and enforce ambient air quality standards that are more stringent than the national standards. The District has adopted the national ambient air quality standards (table 12) (EPA 2007c).

Washington, D.C. (including all 99 Rock Creek Park managed units) is located within the Metropolitan Washington Air Quality Control Region (AQCR 47); an area the EPA has designated as in attainment for all criteria pollutants (CO, NO₂, PM₁₀, SO₂, and Pb) except ozone and PM_{2.5}. Air Quality Control Region 47 includes the District, as well as several counties in Northern Virginia and Southern Maryland. Additionally, the District is in maintenance for CO, after having come into attainment on March 15, 1996 (EPA 2007b). Maintenance areas are designed to ensure that an area that reaches attainment status does not slip back into non-attainment. The EPA has designated Washington, D.C. as in moderate non-attainment for the criteria pollutant ozone. The ambient standards for PM_{2.5} were recently promulgated and the EPA has not yet created thresholds for the level of severity designations (i.e., severe, moderate, etc.). The District ambient air quality levels for 2006 for carbon monoxide, PM₁₀, PM_{2.5}, sulfur dioxide, nitrogen dioxide, and ozone are shown in table 13. There are currently no active lead monitors within the District.

TABLE 12: AMBIENT AIR QUALITY STANDARDS FOR CRITERIA POLLUTANTS

Pollutant	Federal Standard	District of Columbia Standard
Carbon Monoxide (CO) ¹ Maximum 8-Hour Concentration Maximum 1-Hour Concentration	9 ppm 35 ppm	9 ppm 35 ppm
Lead (Pb)* Maximum Arithmetic Mean Over 3 Consecutive Months	1.5 µg/m ³	1.5 µg/m ³
Nitrogen Dioxide (NO ₂) ¹ Annual Arithmetic Mean	0.05 ppm	0.05 ppm
Ozone (O ₃)* 8-Hour Average ⁵	0.08 ppm	0.08 ppm
Inhalable Particulate Matter (PM ₁₀) ² Maximum 24-Hour Concentration	150 µg/m ³	150 µg/m ³
Inhalable Particulate Matter (PM _{2.5}) Annual Arithmetic Mean ³ Maximum 24-Hour Concentration ⁴	15 µg/m ³ 35 µg/m ³	No separate standard
Sulfur Dioxide (SO ₂) ¹ Annual Arithmetic Mean Maximum 24-Hour Concentration Maximum 3-Hour Concentration	80 µg/m ³ 365 µg/m ³ 1,300 µg/m ³	80 µg/m ³ 365 µg/m ³ 1,300 µg/m ³

Source: EPA 2007c

ppm = parts per million; µg/m³=micrograms per cubic meter.

1. Annual standards never to be exceeded; short-term standards not to be exceeded more than once per year.
2. Not to be exceeded more than once per year on average over 3 years.
3. To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.
4. To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35µg/m³ (effective December 17, 2006).
5. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

TABLE 13: REPRESENTATIVE AMBIENT AIR QUALITY MONITORING DATA

Pollutant	District of Columbia Monitoring Data (2006)		
	Monitoring Station	Period	1st/2nd Highest
Carbon Monoxide (CO)	C&P Phone Co. L St. between 20 th & 21 st Streets NW Washington, D.C.	1-hour 8-hour	10.3/3.2 ppm 2.6/2.3 ppm
	34 th and Dix Streets, NE Washington, D.C.	1-hour 8-hour	4.5/4.0 ppm 3.4/3.3 ppm
Sulfur Dioxide (SO ₂)	34 th and Dix Streets, NE Washington, D.C.	1-hour 3-hour 24-hour Annual	0.066/0.065 µg/m ³ 0.045/0.035 µg/m ³ 0.014/0.014 µg/m ³ 0.005 µg/m ³
Particulates (PM ₁₀)	34 th and Dix Streets, NE Washington, D.C.	Monitor 1: 24-hour Annual	63/63 µg/m ³ 30 µg/m ³

Pollutant	District of Columbia Monitoring Data (2006)		
	Monitoring Station	Period	1st/2nd Highest
		Monitor 2: 24-hour Annual	84/61 $\mu\text{g}/\text{m}^3$ 26 $\mu\text{g}/\text{m}^3$
Particulates ($\text{PM}_{2.5}$)	34 th and Dix Streets, NE Washington, D.C.	Monitor 1: 24-hour Annual	45/40 $\mu\text{g}/\text{m}^3$ 13.3 $\mu\text{g}/\text{m}^3$
		Monitor 2: 24-hour Annual	76/39 $\mu\text{g}/\text{m}^3$ 14.3 $\mu\text{g}/\text{m}^3$
	Park Services Office 1100 Ohio Drive Washington, D.C.	24-hour Annual	35/34 $\mu\text{g}/\text{m}^3$ 13.3 $\mu\text{g}/\text{m}^3$
	2500 1 st Street, N.W. Washington, D.C.	24-hour Annual	41/41 $\mu\text{g}/\text{m}^3$ 13.0 $\mu\text{g}/\text{m}^3$
Ozone (O_3)	Takoma School Piney Branch Road & Dahlia Street, NW Washington, D.C.	1-hour	0.086/0.085 ppm
	Park Services Office 1100 Ohio Drive Washington, D.C.	1-hour	0.093/0.093 ppm
	2500 1 st Street, N.W. Washington, D.C.	1-hour	0.102/0.096 ppm
Nitrogen Dioxide (NO_2)	Takoma School Piney Branch Road & Dahlia Street, NW Washington, D.C.	Annual Average	XX $\mu\text{g}/\text{m}^3$
Lead (Pb) Quarterly Average	Connecticut Avenue & Northampton Street, NW Washington, D.C.	Quarterly Average	No data

ppm = parts per million; $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter.

Source: EPA 2007a

Attainment status for ozone is currently based on the 8-hour O_3 standard. As of June 15, 2005, the District is in moderate non-attainment for ozone under this standard. In December 2006, a federal appellate court remanded the EPA's 8-hour O_3 standard. No final decision has been reached on the outcome for this decision. For the purposes of this WTF plan/EA, Rock Creek Park will consider both the standards for severe and moderate non-attainment to ensure this plan is compliant with future court decisions on this matter.

In addition to regional air quality conditions, there are currently two wireless telecommunication facilities in operation in the park. The construction of these facilities occurred in 2000 and took approximately 3 months. Any emissions generated from the construction of these facilities were temporary and have since dissipated. Annual emissions of NO_x , VOC, $\text{PM}_{2.5}$, SO_2 , and CO from the operation of these

facilities would stem from two 60-kilowatt generators (one at each site), which replaced the two 30-kilowatt generators originally at these sites (R. Posilkin, Verizon Wireless, pers. comm., L. Gutman, The Louis Berger Group Inc., December 14, 2007), and routine maintenance vehicle use for visits to the sites. It is assumed that each generator averages about 70 hours of use per year, which includes weekly testing and an allowance for any necessary emergency use during a power failure. Maintenance vehicles travel to the site twice a month for any repairs that may be necessary. The sum of annual generator emissions for both towers is estimated to be approximately 0.136 tons of NO_x and 0.018 tons of VOC, well below the thresholds for either severe (25 tons per year VOC / 25 tons per year NO_x) or moderate (50 tons per year VOC / 100 tons per year NO_x) non-attainment areas. Emissions of particulate matter would be 0.015 tons per year for both facilities, with SO₂ and CO emissions of 0.018 tons per year and 0.075 tons per year, respectively. The *de minimis* thresholds for PM_{2.5} non-attainment, including SO₂ and CO maintenance, are all 100 tons per year.

SOUNDSCAPES

One of the natural resources of Rock Creek Park is the natural soundscape, also referred to as “natural ambient sounds” or “natural quiet.” The natural soundscapes include all of the naturally occurring sounds of the park, such as calling birds, wildlife, as well as the quiet associated with the hiking and horse trails. Noise can be defined as unwanted sound. Noise standards and guidelines applicable to activities in Rock Creek Park include those established by the NPS federal guidance, the NCPC, and the District of Columbia. NPS managers must seek to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values (NPS *Management Policies 2006*, sec. 1.4.3).

Noise levels are most commonly expressed in decibels (dB). The human ear is not equally sensitive to all sound frequencies; therefore, the A-weighted decibel scale (dBA), which is calibrated to the human ear response, is often used when analyzing noise levels. Table 14 illustrates common sounds and their associated exposure concern based on EPA guidance.

TABLE 14: COMMON NOISE SOURCES AND LEVELS

Source	Decibel Level (dB)	Exposure Concern
Soft Whisper	30	Normal safe levels
Quiet Office	40	Normal safe levels
Average Home	50	Normal safe levels
Conversational Speech	65	Normal safe levels
Highway Traffic	75	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Noisy Restaurant	80	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Average Factory	80 to 90	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Pneumatic Drill	100	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Automobile Horn	120	May affect hearing in some individuals depending on sensitivity, exposure length, etc.
Jet Plane	140	Noises at or over 140 dB may cause pain
Gunshot Blast	140	Noises at or over 140 dB may cause pain

dB = decibels

Source: EPA 1986

Rock Creek Park includes approximately 3,000 acres. Sources of noise within Rock Creek Park units and surrounding areas are those typical of an urban area and include recreational activities, motor vehicle operations, and the noises associated with residential development in an urban setting (e.g., lawn mowers). The main unit of Rock Creek Park and the Rock Creek and Potomac Parkway contains an extensive roadway network that is the primary source of noise. Commuters frequently use park roads during rush hour periods. Automobile traffic occurs primarily on the surrounding roadway network, including heavily traveled 16th Street NW to the east and entrance and access roads within the park boundary and surrounding areas. A single automobile produces noise levels in the range of 70 dBA near the vehicle, while moderately heavy traffic may produce noise levels in the range of 85 to 90 dBA near the roadway (Miyara 1998). Automobile traffic is also present adjacent to other units of Rock Creek Park, particularly traffic circles and small triangle parks located throughout the city. The NPS-managed circles act in part to manage traffic and are surrounded on all sides by District city streets. The Glover-Archbold and White Haven units are located between 44th and 42nd Streets in northwest D.C. and are surrounded almost entirely by a residential area. The lower portion of the Glover-Archbold borders Georgetown University and Georgetown Hospital. Noises around these units would be the same as those in the vicinity of Rock Creek and Rock Creek and Potomac Parkway.

Noise from any nearby construction would adhere to the District of Columbia Municipal Regulations (DCMR) Title 20 Chapter 27 requirements (District of Columbia n.d.) that noise levels from construction or demolition activities must not exceed 80 dBA at the boundaries of the construction/demolition site during daytime hours or 55 dBA at night. While the NPS is not subject to these regulations, projects that occur within the park are consistent to the extent possible with local regulations. Due to the urban nature of the park's surroundings, special events, motorcades, police response, and emergency services also contribute to noise in the area. Most other sources of noise within the park system are localized or seasonal in duration (e.g., events at the tennis center, concerts at the Carter Barron Amphitheater, etc.).

In 1996, the NPS performed a study to characterize noise environments in Rock Creek Park (NPS 1997b). The extensive roadway network is the primary source of noise in the park. The study selected 26 noise-monitoring locations and recorded traffic noise levels at these locations with references to distance to the nearest road. In general this study found that the lowest noise levels in the park were found at the golf course, at dB equivalent sound level (Leq), and highest on the jogging trail south of Calvert about 10 feet from Rock Creek and Potomac Parkway (79 dB Leq). This study also found noise levels to be constant throughout the day, with peak and off peak levels differing by 4 dB or less. Areas in the park where noise levels met or exceeded Federal Highway Administration noise abatement criteria included picnic areas south of Military Road within 60 feet of Beach Drive, visitor facilities within 110 to 125 feet of Rock Creek and Potomac Parkway, and segments of recreational trails within 100 feet of Beach Drive and the Parkway (NPS 2005a). All other areas monitored in the park did not meet the Federal Highway Administration noise abatement criteria.

In addition, in 1992, the NPS evaluated noise sources at 15 locations near the tennis center (NPS 1993). Background noise levels at the tennis center, or noise levels when no events are underway, were measured at 55 dB (calculated day/night levels as specified by the American Standards Institute). The data for noise levels emanating from the tennis stadium during tennis events indicated that levels rarely violate the D.C. property line noise standard of 55 dB for times after 9:00 p.m. or 60 dB for times before 9:00 p.m. (NPS 1993).

The two currently operating WTF within the park do generate some level of noise, affecting the park's soundscape. When originally installed, each facility contained a cooling unit, which generated a noise level of 73 dBA at 5 feet from the unit operating at approximately 2- or 3 minute intervals, daily. These cooling units were replaced at the tennis center and maintenance yard in November 2003 and September 2007, respectively. The original Marvair units were replaced by 5-ton Liebert units that contain a feature

called Quiet Line. The Quiet Line feature provides sound attenuation equipment to minimize the sound coming from the cooling units, with noise levels below 58 dBA. These new units also operate at 2- or 3-minute intervals, daily (R. Posilkin, Verizon Wireless, pers. comm., L. Gutman, The Louis Berger Group Inc., December 14, 2007 and December 28, 2007; Emerson Electric Co. 2006).

Additionally, each facility has a generator, which is tested once per week for one hour. The generators, which were replaced in April 2007 at both sites, are 60-kW Katolight diesel units (R. Posilkin, Verizon Wireless, pers. comm., L. Gutman, The Louis Berger Group Inc., December 14, 2007). The noise level produced by these units is approximately 69 to 73 dBA, 23-feet from the unit (Katolight 2007). These noise levels emitted by these facilities comply with all applicable regulations including the NPS, EPA, and the District described above (NPS 2003c).

CULTURAL RESOURCES

Cultural resources are buildings, structures, objects, sites (archaeological and above ground), districts and landscapes that possess prehistoric or historic significance. Significance is further defined as those buildings, structures, objects, sites, districts, and landscapes that are listed or meet eligibility criteria for listing on the National Register (NPS 1998). The eligibility criteria for a National Register classification are as follows. In order to be classified, a property must meet at least one, and may meet more than one, of the criteria shown in table 15.

TABLE 15: NATIONAL REGISTER OF HISTORIC PLACES ELIGIBILITY CRITERIA

Criteria	Description
A	Associated with events that have made a significant contribution to the broad patterns of our history
B	Associated with the lives of persons significant in our past
C	Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic value, or that represent a significant and distinguishable entity whose components may lack individual distinction
D	Have yielded, or may be likely to yield, information important in prehistory or history

The park is charged to preserve and maintain the numerous cultural resources within its boundaries. The park also acknowledges the presence of cultural resources that stand outside of Rock Creek Park that could be potentially impacted by future proposed WTF within the park. A short list of some additional National Register properties located within the vicinity of the park includes Forts Stevens and Reno, the Military Road School located at Military Road and 14th Street, the Ponce de Leon Apartment Building (4514 Connecticut Avenue NW), the Chevy Chase Theater (5612 Connecticut Avenue NW), and the Chevy Chase Arcade, also located on Connecticut Avenue. The park will continue to coordinate its activities and consult with the NCPC and the Commission on Fine Arts, as well as other interested parties, to ensure that significant viewsheds and settings of historic and cultural resources outside the park's units are taken into consideration during future planning for wireless telecommunication facilities within the park.

HISTORIC RESOURCES

Rock Creek Park and Rock Creek and Potomac Parkway

Rock Creek Park was listed on the National Register as an historic district in 1991. The Rock Creek Park Historic District's National Register boundaries are the same as those for Reservation 339, roughly defined as 16th Street to the east, Oregon Avenue and Branch Road to the west, Klinge Road to the south, and the District line and Parkside Drive to the north. The historic district contains 1,754.62 acres of land dominated by picturesque landscapes featuring forested areas, streams, valleys, meadows, and sloping hills. The park meets National Register Criteria A, B, and C under the themes of architecture, community planning and development, conservation, entertainment and recreation, industry, landscape architecture, military, and horticulture. Significant persons associated with the history of the park include Joshua Peirce and landscape architects Frederick Law Olmsted, Jr., and John C. Olmsted. The park as a whole retains a high degree of integrity of design, workmanship, location, feeling, association, and setting.

An inventory of above-ground resources located within the National Register historic district boundaries identified 31 contributing resources and 59 non-contributing resources. A contributing resource represents a building, structure, site, or object that is associated with one or more of the themes under which the district is significant and that retains a high degree of integrity. Among the 31 contributing resources are buildings and structures related to the Peirce-Klinge House and the Peirce Mill, as well as Beach Drive and many of the park's other roads and trails. First built in 1823 by Joshua Peirce, the Peirce-Klinge House consists of a three-story stone farmhouse combining Georgian and Pennsylvania German folk architectural characteristics. Begun in 1829, the Peirce Mill is associated with broad historical trends related to Washington's agricultural and commercial development during the 19th century. In operation until 1897, the stone mill now stands as the only extant grist mill in the city. Originally built between 1831 and 1941, Beach Drive and the park's other roads and trails comprise a historically significant circulation network. Although extensive sections of Beach Drive, Bingham Drive, and Piney Branch Parkway (also contributing roadways), were reconstructed, straightened and rebuilt during 1958, the roads still maintain their design intent (Bushong 1990).

Additional resources contributing to the Rock Creek Park historic district include: the Jules J. Jusserand Memorial located about one-quarter mile south of the Peirce Mill complex; the Peirce Mill Bridge; the Boulder Bridge; the Visitor Center and Park Police Substation; the Old Military Road Bridge; the Joaquin Miller Cabin located at Picnic Area No. 6; the Milkhouse Ford and associated structures; the Rolling Meadow Bridge carrying a pedestrian trail across Rock Creek; the Pinehurst Bridge; and numerous culverts and retaining walls. The 31 contributing resources listed on the park's National Register nomination are listed in table 16.

TABLE 16: ROCK CREEK PARK HISTORIC DISTRICT CONTRIBUTING RESOURCES

Resource	Type	Individually Eligible
Peirce-Klinge Mansion (Linnaean Hill)	Site/Designed Landscape	No
Peirce-Klinge House	Building	Yes
Peirce-Klinge Utility House	Building	Yes (part of Peirce-Klinge House)
Peirce-Klinge Potting Shed	Building	Yes (part of Peirce-Klinge House)
Peirce-Klinge Stable/Garage	Building	Yes (part of Peirce-Klinge House)
Peirce Barn (Coach House)	Building	Yes

Resource	Type	Individually Eligible
Peirce Springhouse (includes retaining walls)	Building	Yes
Peirce Mill	Building	Yes
Peirce Mill Dam	Structure	No
Peirce Mill Bridge	Structure	No
Joaquin Miller Cabin	Building	No
Visitor Center/Park Police Substation	Building	No
Jules J. Jusserand Memorial Bench	Object	No
Fort DeRussy Earthworks	Site	Yes (part of Civil War Forts thematic listing)
Ross Drive Bridge	Structure	Yes
Grant Road Bridge	Structure	No
Boulder Bridge	Structure	No
Pinehurst Branch Bridge	Structure	No
16 th Street Bridge	Structure	No
Old Military Road Bridge	Structure	No
Milkhouse Ford and Cross Valley Structures	Structure	No
Morrow Drive Bridge	Structure	No
Rapids Footbridge	Structure	No
Rolling Meadow Footbridge	Structure	No
Riley Spring Footbridge	Structure	No
Boundary Footbridge	Structure	No
Bluffs Footbridge	Structure	No
Circulation Network – Roads and Trails		No
Beach Drive	Structure	No
Peirce Mill (Park) Road	Structure	No
Piney Branch Parkway	Structure	No
Grant Road	Structure	No
Sherrill Drive	Structure	No
Wise Road	Structure	No
Bingham Drive	Structure	No
Joyce Road	Structure	No
Ridge (Glover) Road	Structure	No
Ross Drive	Structure	No
Morrow Drive	Structure	No
Rock Creek Golf Course	Site	No
Outdoor Fireplaces	Objects	No
Culverts and Retaining Walls	Structures	No

In addition to the above contributing resources, the NPS lists an additional 45 contributing elements to Rock Creek Park on its List of Classified Structures. Among these 45 elements are masonry retaining walls and stone steps at the Peirce-Kling House, rustic-style culverts along Bingham Drive, the Blagden Mill footbridge and race, bridge ruins, street lights, and old road and trail sections. The NPS also considers the following elements contributing to the Rock Creek Park district and worthy of preservation: the Peirce Mill Flume; Blagden Mill Road Bridge Abutment; the PA 24 Picnic Shelter; stone comfort stations; and a horse trough (Bushong 1990).

The Rock Creek and Potomac Parkway was listed on the National Register in 2005 as a historic district under the multiple property listing “Parkways of the National Capital Region, 1913–1965.” Conceived in 1902 by the Senate Park Commission, also known as the McMillan Commission, the Parkway comprises a major component of the District of Columbia’s comprehensive park system developed following City Beautiful ideals during the early 20th century. Originally built for horse-drawn carriages, horseback riders, pedestrians and the occasional automobile, the Rock Creek Parkway formed one of the earliest parkways in the nation and the first federally funded park road. The Rock Creek and Potomac Parkway experienced numerous design changes to facilitate growing automobile use during the early 1900s, and, as the oldest parkway in the metropolitan Washington area, the Parkway features numerous layers of American parkway design. Although the Parkway’s long-term evolution resulted in contributions from several landscape architects, including James G. Langdon and Irving W. Payne, Frederick Law Olmsted, Jr., perhaps asserted the most influence on the Parkway’s construction and evolution as a member of the CFA and the National Capital Park and Planning Commission. The Rock Creek and Potomac Parkway is significant under Criteria A and C in the areas of community planning and development, landscape architecture, architecture, and recreation during the period 1791 to 1951 (Barsoum 2002).

The Rock Creek and Potomac Parkway Historic District contains approximately 173 acres of land encompassing areas historically functioning as the parkway established by the Senate Park Commission to link the Mall and Potomac Park with the National Zoological Park and Rock Creek Park. Contributing resources within the boundaries of the Parkway district include the roadway, including all stone and stone-faced retaining walls built in conjunction with the roadway, bridges, trails, and culverts. Resources listed on the Parkway’s National Register nomination as contributing to the historic district are listed in table 17.

TABLE 17: ROCK CREEK AND POTOMAC PARKWAY CONTRIBUTING RESOURCES

Resource	Type	Individually Eligible
Sewer Pumping Station	Building	No
Washington City Tunnel Storage Shed	Building	No
K Street Bridge	Structure	No
Pennsylvania Avenue Bridge	Structure	No
M Street Bridge	Structure	No
P Street Bridge	Structure	No
South Waterside Drive and Overpass	Structure	No
North Waterside Drive	Structure	No
Massachusetts Avenue Bridge	Structure	No
Connecticut Avenue (Taft) Bridge	Structure	No
Calvert Street Bridge	Structure	No
P Street Road Bridge	Structure	No

Resource	Type	Individually Eligible
Shoreham Hill Road Bridge	Structure	No
Lyon's Mill Footbridge	Structure	No
Shoreham Hill Footbridge	Structure	No
Rock Creek and Potomac Parkway Roadway	Structure	No
Trail Network	Structure	No
Culverts	Structure	No
Retaining Walls	Structure	No
Stone Seawall	Structure	Yes (part of East-West Potomac Parks)
Dumbarton (Q Street) Bridge	Structure	Yes
The Arts of Peace	Object	No
Millet Lamp Posts (along the Stone Seawall)	Object	No
Sycamore Allee	Site	No
Rock Creek	Site	No
P Street Beach	Site	No
Median (Between Q Street and Massachusetts Avenue)	Site	No
Shoreham Hill	Site	No
Quarry	Site	No
Woodley Lane Bridge Abutments	Site	No
Godey Lime Kilns	Structure	Yes

In addition to the above resources, the NPS also considers the Washington City Tunnel Shed and the Woodley Lane House Foundation as contributing to the Rock Creek and Potomac Parkway district (Barsoum 2002).

Glover-Archbold Park and Whitehaven Parkway

Listed on the National Register in January 2007, Glover-Archbold Park consists of 221.62 acres of land bordering Foundry Branch in Reservations 351 and 450. The park primarily consists of an urban forest located within a narrow valley roughly defined by Wisconsin and Nebraska avenues. Named in honor of the two people who donated much of the land comprising the current park, Charles Carroll Glover (1846–1936) and Anne Archbold (1873–1968), the park now provides recreational opportunities for the city's residents and visitors. Glover, a banker and well-known businessman committed to the development of the northwestern portions of the Nation's Capital, was instrumental in the creation of Rock Creek Park, Potomac Park and Fort Dupont Park during the late 19th and early 20th centuries. He also contributed to the establishment of the Riggs Bank, the National Cathedral, and the Corcoran Gallery of Art. The park contains four contributing structures: a trail network, a spring house, a stone culvert at Reservoir Road, and a railroad trestle bridge. The park is significant during the period between 1890 and 1943, and meets National Register Criterion A in the areas of community planning and development and conservation, and Criterion B for its association with Glover (Barsoum 2006c).

The Whitehaven Parkway located on Reservation 357 contains one historic structure, an islet culvert that the NPS considers worthy of preservation. The culvert features stonework similar to structures found in the adjacent Dumbarton Oaks Park. Although not listed on the National Register, the NPS considers the structure significant and worthy of preservation.

Traffic Circles and Other Small Parcels

Chevy Chase Circle: Chevy Chase Circle (Reservation 335A) contains two historic resources currently under review for listing on the National Register, the Francis Griffith Newlands Memorial Fountain and a pair of commemorative stone markers related to the Garden Club of America. The Francis Griffith Newlands Memorial Fountain stands in the center of Chevy Chase Circle located at the intersection of Connecticut and Western avenues, NW, and the secondary roads of Patterson and Grafton streets and Magnolia Parkway. The circle is bisected by the District of Columbia's western border with Maryland. The memorial consists of a 60-foot diameter Aquia sandstone fountain with a concrete basin with a single, centrally placed bronze nozzle spraying water approximately 30 feet high. Designed by Washington architect Edward W. Donn, Jr., and installed in 1933, the fountain features simple classical moldings on the face of its 2.5-foot high basin. A projecting panel at the center of the fountain's southern side contains an inscription memorializing Francis Griffith Newlands (1848–1917), a Nevada senator and founder of Chevy Chase. The fountain also features a circular walk of irregularly shaped flagstone set into concrete, radial flagstone paths, benches and planting beds. The fountain is significant under Criterion C in the area of art for its association with Newlands as part of the multiple property nomination "Memorials in Washington, D.C." The "Memorials in Washington, D.C." multiple property document is currently under consideration for National Register eligibility by the NPS and the District of Columbia Historic Preservation Office (Barsoum 2006b, 2007).

The proposed NRHP Multiple Property listing, *Garden Club of America Entrance Markers in Washington, D.C.* identifies the two stone markers at Chevy Chase Circle as representatives of the entrance markers commemorating the 200th anniversary of George Washington's birth. Made of Aquia sandstone, the rectangular-shaped markers stand in alignment with Western Avenue within the median between the flagstone pavers and benches surrounding the Newlands Fountain. Both markers originally stood 5 feet tall and possessed fluting running on-center vertically the full length of the shaft and horizontally along the stone's edges, along with incised shields or cartouches depicting the Calvert Coat of Arms for the State of Maryland and a bas-relief of George Washington with the inscription "District of Columbia." The western of the two Chevy Chase markers appears to stand at its original 5-foot height but exhibits worn fluting and a large crack. The eastern marker appears to be an upper half portion of a marker set atop a concrete base raising the marker to the proper overall height. Designed by Edward Donn, the markers are significant as extant objects commemorating the George Washington Bicentennial Celebration in 1932 and as landscape objects demarcating a formal entrance into the District of Columbia. The markers meet significance under Criterion A in the areas of art and landscape architecture in the period 1932 to 1933 (Anon. 2007).

Grant Circle: Grant Circle, located at Reservation 312 along New Hampshire Avenue's intersection with 5th Street, NW, contains a plaque dedicating the circle to President Ulysses S. Grant in 1965. Although not listed on the National Register, the NPS considers the object a significant memorial worthy of preservation (Scott 1977b).

Ward Circle: Ward Circle located in Reservation 572 at the intersection of Nebraska and Massachusetts's avenues contains the Major General Artemas Ward Monument, a contributing element to the National Register-listed American Revolution Statuary thematic nomination. The Ward Statue comprises one of 14 outdoor monuments located throughout Washington and owned by NPS commemorating military heroes, political leaders, and other patriots who contributed to the young

nation's war for independence from Great Britain. The statues typically consist of bronze pedestrian or equestrian figures (the listing includes one marble statue) set atop stone pedestals standing on squares and circles around public buildings and on small traffic islands. The statues were primarily installed during the late 19th and early 20th centuries by the Federal government. Placed on the National Register in 1978, the statues meet National Register significance criteria in the areas of military, politics/government, and sculpture (Scott 1977a).

The Ward Statue memorializes the former governor of Massachusetts and the first commander of the Massachusetts military forces prior to George Washington's assumption of overall command of the Continental army, Artemas Ward (1727–1800). The bronze figure stands 10 feet tall atop a 10-foot high granite base. Leonard Crunelle sculpted the standing figure and used Ward's actual cape and a Charles Willson Peale portrait of Ward as models. Installation of the statue occurred in 1938. The listed property is the statue itself and does not include any surrounding parkland (Scott 1977a). Although not included as part of the statue's National Register property, the NPS considers Ward Circle's landscape to contribute to the object's significance and worthy of preservation. The circle consists of a flat surface covered with grass and a large ring of roses planted around the centrally placed statue (Scott 1977a; NPS 2007c).

Westmoreland Circle: Similar to Chevy Chase Circle, Westmoreland Circle, located on Reservation 559 at the intersection of Massachusetts Avenue NW with Western Avenue features two stone markers contributing to the proposed Garden Club of America Entry Markers in Washington, D.C. NRHP Multiple Property listing. The Westmoreland markers stand on either side of the grassy circle in alignment with Western Avenue and Dalecarlia Parkway. The western marker features its original surrounding chain fence and both the District and Maryland cartouches remain legible, although worn. The eastern marker stands slightly askew, probably the result of its unfenced, unprotected status leaving it susceptible to motorists' careless driving. The stone face of one corner of the eastern marker has been sheared off. However, the Maryland cartouche remains on the eastern marker in remarkably unweathered condition. Designed by Edward Donn, the two markers comprise significant commemorative objects celebrating the bicentennial of George Washington's birth in 1932. The markers also serve as significant landscape objects demarcating a formal entrance into the District of Columbia. The markers meet National Register Criterion A in the areas of art and landscape architecture for the period 1932 to 1933 (Anon. 2007).

Triangle Parks: Rock Creek's Triangle Parks feature four National Register-listed or eligible objects.

The Francis Asbury Statue stands on Reservation 309-B1 located at the intersection of 16th and Mount Pleasant Streets NW. Listed on the National Register in 1987 as a contributing element of the Mount Pleasant Historic District, the statue is also under consideration for individual listing under the *Memorials in Washington, D.C.*, NRHP Multiple Property listing. The monument consists of a 10.5-foot tall bronze equestrian figure atop a marble pedestal and memorializes one of the nation's first Methodist bishops, Francis Asbury (1745–1810). The statue, dedicated in 1924 and designed by H. Augustus Lukeman with a base by Evarts Tracy, is significant as a rare example in the Capital city commemorating a religious leader. The statue meets National Register Criterion C in the area of art (NPS 2007c; Barsoum 2006a).

The Guglielmo Marconi Memorial is located on Reservation 309-A1 at the intersection of Sixteenth and Lamont streets NW. Similar to the Asbury statue, the Marconi Memorial was originally listed on the National Register in 1987 as a contributing element of the Mount Pleasant Historic District. The memorial is under consideration for individual listing under the Memorials in Washington, D.C. NRHP Multiple Property listing. The Art Deco-styled memorial features a bronze bust of Marconi (1874–1937) placed atop a pedestal set in front of a granite shaft supporting an allegorical female figure soaring above a globe and clouds. Marconi invented wireless telegraphy, the precursor of modern radio. Sculptor Attilio

Piccirilli and architect Joseph Freedlander completed the memorial. Installation of the memorial occurred in 1941 (NPS 2007c; DCHPO 2004).

The Major General George B. McClellan Statue stands on Reservation 303 located at the intersection of Connecticut Avenue and California Street, NW. Erected in 1907, the statue comprises a contributing element of the Civil War Monuments in Washington, D.C., thematic district listed on the National Register in 1978. The statute also contributes to the Kalorama Triangle Historic District listed on the National Register in 1987. The statue consists of a 9-foot high bronze equestrian figure atop a stone pedestal decorated with bronze trophies and eagles bearing garlands of oak and laurel. Frederick MacMonnies sculpted the statue while architect James Crocroft designed the base. McClellan (1826–1885) led the Army of the Potomac during the Peninsula Campaign and at the Battle of Antietam in 1862, and endeared himself to many of his subordinates for his concern for his soldiers' morale and well-being. The veterans group Society of the Army of the Potomac provided funding for improvement of the statue's site (NPS 2007c; Scott 1977b).

The James Cardinal Gibbons Statue, located on Reservation 309-G at the intersection of 16th Street and Park Road, NW, is under consideration for individual listing under the *Memorials in Washington, D.C.*, Multiple Property listing. Sculpted by Leo Lentelli and dedicated in 1932, the statue features a bronze seated figure set atop a granite pedestal with a granite, marble and reinforced concrete platform. Cardinal Gibbons (1834–1921) was born in Maryland and served as chaplain at Fort McHenry, became a priest, Bishop, and Archbishop, and became the second American to be elevated to Cardinal. Gibbons also proved instrumental in the establishment of Catholic University in Washington and served as its first Chancellor. The Knights of Columbus funded construction and installation of the statue (NPS 2007c).

A fifth Triangle Park located on Reservation 397 and containing the Peter Muhlenberg Memorial is considered not eligible for listing on the National Register. The Muhlenberg Memorial, sculpted by Caroline Muhlenberg Hufford and installed in 1980, does not meet National Register age criteria.

CULTURAL LANDSCAPES

Cultural landscapes, as defined by The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes, consist of "a geographic area (including both cultural and natural resources and the wildlife or domestic animals therein) associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values (NPS 1995)." As part of its ongoing efforts to identify and properly manage its significant cultural resources, the NPS has initiated the identification, documentation, and appropriate treatment of cultural landscapes at Rock Creek Park. As a result of these efforts, the NPS has determined that cultural landscapes exist at the following Rock Creek Park units:

- Rock Creek Park
- Peirce Mill
- Linnaean Hill
- Fort Circle Parks
- Rock Creek and Potomac Parkway
- Glover-Archbold Park
- Whitehaven Parkway
- Chevy Chase Circle

- Grant Circle
- Sherman Circle
- Triangle Parks (Mt. Pleasant Parks)

Cultural landscape inventories have been conducted for some of these park units. A cultural landscape inventory (CLI) identifies and documents the characteristics of a cultural landscape that make it significant and worthy of preservation. The CLIs permit the NPS to collate and evaluate information on the location, historical development, and features of the cultural landscapes that will assist park managers in their planning, programming, recording treatment, and management decisions. Of the above listed cultural landscapes, CLIs have been prepared for Rock Creek Park (Linnaean Hill and Peirce Mill) and Chevy Chase Circle.

Rock Creek Park and Rock Creek and Potomac Parkway

Created by an act of Congress in 1890, Rock Creek Park encompasses the last major natural landscape in the District. The area comprising the park was little modified by human interaction prior to its creation as a park. Since that time, the park has balanced the preservation and maintenance of the valley's natural and cultural resources with the recreational and transportation requirements of modern Washington while incorporating the highest cultural and aesthetic values. As such, Rock Creek Park is considered a significant cultural and historic landscape (NPS 1998).

In 1997, the NPS began a CLI of Rock Creek Park. The results of that inventory concluded that Rock Creek Park met the criteria for listing on the National Register as a historic designed landscape. In addition, the CLI determined that two component landscapes of the park, Linnaean Hill (including the Peirce-Klingbein Mansion) and the Peirce Mill contribute to the significance of the Rock Creek Park cultural landscape, and thus comprise individually eligible landscape elements (NPS 1998).

Glover-Archbold Park and Whitehaven Parkway

Cultural landscape inventories have not been conducted for either the Glover-Archbold or White Haven units of Rock Creek Park.

Traffic Circles and Other Small Parcels

Chevy Chase Circle is the only Rock Creek Park managed traffic circle or other small parcel that has a CLI. In 2005, the NPS prepared a CLI for Chevy Chase Circle. The results of the inventory determined that Chevy Chase Circle met the criteria for listing on the National Register as a historic designed landscape associated with architect Edward Donn, Jr., the Garden Club of America, and local community development. The circle is also significant for its associations with Senator Francis G. Newlands, the City Beautiful and picturesque suburbs movements, and the development of Chevy Chase. The inventory identified three principal design episodes at the circle that reflected its establishment as a memorial in 1933 and improvements undertaken in ca. 1956 and ca. 1990 (NPS 2005c).

ARCHEOLOGICAL RESOURCES

Rock Creek Park and Rock Creek and Potomac Parkway

The Rock Creek Park and Rock Creek and Potomac Parkway units have been subjected to previous studies and archeological work as part of contextual and cultural resource management projects. Primary

studies conducted for the park by Humphrey and Chambers (1977), Inashima (1985), Little (1995), Moran (1997), and The Louis Berger Group, Inc. (2004, 2005, 2006) have provided a considerable background of the prehistoric and historic archeological resources previously documented within the park boundaries, as well as context development outlining the anticipated resource types that may be present in the park.

There are at least 40 archeological sites in the Rock Creek valley with known prehistoric occupations or deeply buried prehistoric occupations (table 18). Quarry sites are most notable in the archeological record of the park. The early studies of quartzite and steatite quarry sites in the Rock Creek valley by William Henry Holmes of the Bureau of American Ethnology between 1889 and 1894 provided an initial interpretation of bifacial tool manufacture and established a rudimentary chronology for Native American presence in North America. Investigations of quarry debris at the Piney Branch and Dumbarton Heights quarry sites identified short-duration quarry activities associated with tool manufacture and possibly processing of hide, flesh, bone and wood (Munford 1982). While Holmes theorized that the short temporal span of the quarry piles reflected the entire four to five thousand year history of native culture, 20th century radiocarbon dating of organic deposits at sites yielding similar artifact types in the Savannah River complex suggest a date of 2500 to 1500 B.C. (Berger 2004). Holmes' research in the Rock Creek valley led to the recordation of additional quarry sites, including the Rose Hill steatite quarry site, demolished with the construction of Connecticut Avenue, among others (table 18). In addition to the work of Holmes, Humphrey and Chambers (1977) identified a quarry site south of Military Road in close proximity to the park's Nature Center. Little information was provided regarding the contents of this quarry site; however, the overwhelming presence of quartzite in the valley suggests that this site also utilized local quartzite deposits.

Inashima's (1985) investigation of the Rock Creek floodplain as part of an erosion control and bank stabilization project recorded four prehistoric sites. Site 51NW78 (previously known as Site RC-1) yielded a small concentration of undiagnostic lithic artifacts from a heavily disturbed context. Site 51NW81 (previously known as Site RC-3) exhibited prehistoric materials from two 1.5-foot square test unit excavations, but no description was provided concerning the form or function of these artifacts. Site 51NW80 (previously known as Site RC-4) yielded a total of 399 lithic artifacts and an undisclosed amount of fire-cracked rock fragments. Two tools, a possible side-notched rhyolite point and a basal fragment of a narrow side-notched quartzite point, were attributed by Inashima to the Late and Early Archaic periods, respectively. However, Berger (2004) suggests that the rhyolite point is more characteristic of Middle Archaic "Lobate" style, while the quartzite point is representative of late Middle Archaic (Rowan, Halifax) or Late Archaic (Normanskill) types. Site 51NW117 (previously known as Site RC-2) produced two Late Archaic period projectile points and two small sherds of Early Woodland period Accokeek pottery.

Examples of deeply buried prehistoric occupations were noted in the creek valley as well. Archeological investigations for the Whitehurst Freeway Corridor, near where Rock Creek drains into the Potomac River, identified intact and undisturbed prehistoric archeological deposits capped with 1 to 5 meters of historic fill. The Peter House Site, situated on a high terrace approximately 170 meters to the east of the creek, yielded stratified archeological deposits containing Middle Archaic to Late Woodland projectile points and Late Woodland ceramic sherds, including two intact early Late Woodland period hearths. The Ramp 3 site (Site 51NW117), located at the eastern edge of the Rock Creek Parkway, contained a late Middle Woodland period cremation burial overlain with a Late Woodland deposit. The cremation burial contained unique grave goods, including an antler comb, pendants, a phallus, Great White shark teeth, and pieces of preserved plant fiber textile, all attributed to the Kipp Island phase noted in Northeast archeological sites, as opposed to sites recorded in the Middle Atlantic region. The Whitehurst West Site (Site 51NW117W), found on a terrace adjacent to Rock Creek, west of the Rock Creek Parkway,

contained a late Middle Woodland to early Late Woodland feature containing animal bone, ceramic sherds, and plant remains, reflecting food processing activities (Crowell and Potter 2000).

TABLE 18: PREHISTORIC SITES IN ROCK CREEK PARK AND ROCK CREEK AND POTOMAC PARKWAY, AND OTHER RESERVATIONS

Site Number	Resource Type	Documentation
51NW1 and 51NW4	Extant Late Archaic quartzite cobble quarry	Holmes 1897; Fidel et al. 2004
51NW2	Identified by B. Powell; condition unknown	Moran 1997
51NW5	Soapstone quarry west of Connecticut Avenue between Albermarle and 36th Streets, destroyed by construction	Holmes 1897; Moran 1997
51NW7	Lithic reduction site, workshop; overlaps with Site 51NW152	DCSHPO Form
51NW20	Archaic workshop	Holmes 1897; Moran 1997
51NW22	Archaic points, Woodland pottery, postmolds	McNett 1972
51NW23	Condition unknown	Moran 1997
51NW44	Site by Oak Hill Cemetery, destroyed	Moran 1997
51NW47	Prehistoric campsite	Moran 1997
51NW60	Soapstone quarry identified by J.D. McGuire	Moran 1997
51NW103	Middle Archaic, Middle and Late Woodland components within prehistoric deposits capped by 3 feet of historic fill	Moran 1997
51NW117	Middle and Late Woodland components	Glumac et al. 1993; Crowell and Potter 2000
51NW117W	Late Woodland occupational features, with possible Late Archaic component	Glumac et al. 1993; Crowell and Potter 2000
51NW80	Prehistoric	Inashima 1985
51NW81	Prehistoric	Inashima 1985
51NW79	Prehistoric	Inashima 1985
51NW78	Prehistoric	Inashima 1985
51NW143	Prehistoric lithic concentrations	Fidel et al. 2004
51NW144	Prehistoric isolate	Fidel et al. 2004
51NW146	Prehistoric lithic scatters	Fidel et al. 2004
51NW147	Prehistoric lithic scatters and Historic artifacts	Fidel et al. 2004
51NW148	Prehistoric debitage scatter and Historic artifacts	Fidel et al. 2004
51NW149	Prehistoric debitage and Historic	Fidel et al. 2004
51NW150	Prehistoric debitage	Fidel et al. 2004
51NW152	Prehistoric; quarry	Fidel et al. 2004
51NW153	Prehistoric	Fidel et al. 2004
51NW155	Prehistoric and Historic	Fidel et al. 2004
51NW158	Prehistoric and Historic	Fidel et al. 2004
51NW160	Prehistoric	Fidel et al. 2004
51NW162	Prehistoric	Fidel et al. 2004
51NW163	Prehistoric and Historic	Fidel et al. 2004
51NW164	Prehistoric and Historic	Fidel et al. 2004
51NW167	Prehistoric lithic scatter	Berger 2005

Site Number	Resource Type	Documentation
51NW170	Prehistoric lithic scatter	Berger 2005
51NW171	Prehistoric camp	Berger 2005
51NW172	Prehistoric lithic scatter	Berger 2005
51NW173	Prehistoric	Berger 2005
51NW175	Historic and Prehistoric artifact scatter	Berger 2005
51NW189	Prehistoric; tested cobbles and debitage scatter	Berger 2006
51NW192	Prehistoric debitage scatter	Berger 2006
51NW196	Prehistoric debitage scatter in floodplain	Berger 2006
51NW197	Prehistoric; debitage scatter and Early Woodland point	Berger 2006

Source: The Louis Berger Group 2006

In 2003, NPS contracted with The Louis Berger Group to execute a four-year program for the identification and evaluation of archeological resources within Rock Creek Park. The field work for this program concluded in 2006 and the final report is expected by the end of 2007. During the investigations undertaken by Berger, a number of new prehistoric and historic sites were identified within Rock Creek Park and its administrated units. The first year of investigation included an exhaustive documentary investigation of the earliest historic occupations of the Rock Creek Valley, examination of the collections amassed by W.H. Holmes during his 19th century archeological investigations, and the documentation of 19 new sites. These sites included a prehistoric quarry (Site 51NW153), small prehistoric lithic scatters or isolates (Sites 51NW160, 51NW162, 51NW144, 51NW146, and 51NW150), and dense prehistoric lithic concentrations on upland ridge-tops (Sites 51NW155, 51NW158, and 51NW143) (Berger 2004). Year 2 of the four-year study identified 4 new sites including a multi-component prehistoric camp (Sites 51NW171) and two debitage scatters (Sites 51NW172 and 51NW173). More intensive testing for sites identified in Year 1 occurred during Year 2 and included prehistoric camps (Sites 51NW143, 51NW147, 51NW155, and 51NW158). The findings of the dense prehistoric sites at Sites 51NW158 and 51NW1717 was an exciting discovery and shown a consistent cultural zonation by depth as defined by the contrasting relative frequencies of rhyolite vs. quartzite (Berger 2005). Four additional prehistoric camp sites were identified during Year 3 of the study (Sites 51NW187, 51NW193, and 51NW199).

Prior to the execution of the multi-year program by The Louis Berger Group, investigations of historic period archeological sites within Rock Creek Park and the Rock Creek and Potomac Parkway resources were sparse (table 19). A historic mill complex identified as associated with Blagden Mill was investigated in 1981 and 1983 by a New York University field school near Beach Drive (Site 51NW8) (Moran 1997). Two other sites were identified prior to Berger's study, Site 51NW74 comprised of material from the late 19th–20th century at one of the Fort Circle Parks (Killion et al. 2001) and Site 51NW112 comprised of the remains of single family homes (1850–1890) and rowhouses (1890–1950) discovered as part of the Georgetown University Access Road construction project (Comer 1995). Cultural Landscape Inventories conducted by the NPS for Linnaean Hill and Peirce Mill resources indicated an absence of known archeological investigations or sites within these resources (NPS 2003a, 2003b). However, Berger conducted an investigation at both of these locations during Year 1 and identified three sites between the two locations (Sites 51NW157 and 51NW158, and Site 51NW154) (Berger 2004). The Clagett Barn Site, which was first researched in 1979 by Mackintosh and Rousuck, was investigated by Berger (Site 51NW145); a small amount of artifacts were recovered (Berger 2004). An examination of a Civil War resource was investigated during Year 1 and Site 51NW159, which incorporated a Civil War-era dump site, was identified (Berger 2004).

Years 2 and 3 of the archeological study by Berger focused on a more intensive study of some historic sites including Site 51NW154, the Civil War-era dump site (Site 51NW159), the Montrose estate (Site 51NW161), and Site 51NW163 that was associated with a skirmish line during the Civil War (Berger 2005). New historic sites identified during these years included three Civil War batteries (Sites 51NW168, 51NW169, and 51NW175). Year 3 also focused on the execution of additional archival research pertaining to the tenants and tenancies in the Rock Creek Valley. Fifteen additional historic sites were identified during this phase and included a quarry (Site 51NW195), the Whitby Site (Site 51NW185), the Charles Dickson Site (Site 51NW198), and the Carroll Tenancy Site (Site 51NW187).

TABLE 19: HISTORIC ARCHEOLOGICAL RESOURCES SITES IN ROCK CREEK PARK AND ROCK CREEK AND POTOMAC PARKWAY

Site Number	Resource Type	Documentation
51NW8	Historic mill complex	Moran 1997
51NW74	No remains of fort; late 19th-20th c. material	Killion et al. 2001
51NW112	Remains of single-family homes (1850-1890) and rowhouses (1890-1950)	Comer 1995
51NW145	Historic structure researched in 1979	Berger 2004
51NW151	Historic	Berger 2004
51NW154	Historic	Berger 2004
51NW156	Historic; including association with greenhouse	Berger 2004
51NW157	Historic	Berger 2004
51NW159	Civil War-era Dump	Berger 2004
51NW161	Historic; associated with 19th century estate	Berger 2004
51NW165	Historic isolate	Berger 2004
51NW166	Historic isolate	Berger 2004
51NW168	Civil War battery	Berger 2005
51NW169	Civil War battery	Berger 2005
51NW175	Civil War batter (also see table 18)	Berger 2005
51NW181	19th century tenant residence	Berger 2006
51NW182	Historic, unknown affiliation	Berger 2006
51NW183	19th century tenant residence	Berger 2006
51NW184	19th century tenant residence	Berger 2006
51NW185	19th century tenant residence	Berger 2006
51NW186	19th century tenant residence	Berger 2006
51NW187	Late 18th century tenant residence	Berger 2006
51NW188	19th century residence	Berger 2006
51NW190	19th century residence	Berger 2006
51NW191	Early 20th century dump	Berger 2006
51NW193	Late 18th century-early 19th century residence	Berger 2006
51NW194	19th century quarry face	Berger 2006
51NW195	19th century quarry face	Berger 2006
51NW198	19th century residence	Berger 2006
51NW199	18th century domestic	Berger 2006

Glover-Archbold Park and Whitehaven Parkway

According to the NRHP nomination form for the Glover-Archbold Park, a Native American quarry is located in the park's boundaries near Beecher Street (Barsoum 2006c). Additional information was not provided within the nomination itself. In 2004, The Louis Berger Group conducted a walkover reconnaissance south of this area and identified extensive quartzite debitage (Site 51NW152) (Berger 2006). A discrete quartz outcrop and debitage concentration is located near the location described in the NRHP nomination (Berger 2004).

Traffic Circles and Other Small Parcels

Six traffic circles, including Chevy Chase Circle, Grant Circle, Sherman Circle, Tenley Circle, Ward Circle, and Westmoreland Circle, were reviewed to identify previously recorded archeological sites. To date, no archeological investigations have been conducted in any of the six traffic circles or in the triangle parks.

SOCIAL RESOURCES

VISITOR USE AND EXPERIENCE

Rock Creek Park and Potomac Parkway

Founded as one of the nation's first federal parks, Rock Creek Park is one of the largest forested urban parks in the nation supporting an average of more than 2 million recreational visitors per year. In 2006, park visitation equaled 2,181,863 visitors (NPS 2007a). Another 12 million people visit the park annually for non-recreational purposes such as commuting (NPS 2003c). The park offers a wide variety of natural, historical, and recreational opportunities some of which include hiking, biking, horseback riding, bird watching, wildlife viewing, picnicking, golf, other sports activities, nature walks, and educational activities. An extensive system of trails and paths cross Rock Creek Park. Other visitors come to Rock Creek Park for motorized touring, specifically along Beach Drive, a north-south transportation corridor through the park. There are no entrance fees, although some fees are charged for various activities in the park. In the park, the visitor experience includes enjoying such features as the changing seasonal colors; life cycles and scents of the forest; sounds of water, wind, and small animals, including birds; and natural quiet (NPS 2005a).

Recreation Opportunities

Rock Creek Park offers visitors a variety of recreation options, including paved multi-use trails, an extensive system of hiking and horseback riding trails, and the Rock Creek Horse Center for public horseback riding and horse boarding. The park also features an 18-hole public golf course, tennis courts, picnic areas, and other sports fields. Other activities include canoeing and kayaking on Rock Creek, interpretive programs at the Rock Creek Nature Center and Planetarium, Peirce Mill complex, and Old Stone House. Finally, the park offers the Carter Barron Amphitheater, which is a 4,000-seat outdoor theater offering summer musical and theatrical performances. Beach Drive is a popular site for such activities as walking, in-line skating, and bicycling. It is within the narrow creek valley for much of the length of the park. During weekends and holidays when three segments of Beach Drive are closed to automobile traffic, thousands of people recreate along its length. (NPS 2003c, 2005a). During weekdays, participation in non-motorized recreation activities along Beach Drive is limited because the road is a busy thoroughfare for commuter traffic. The Rock Creek and Potomac Parkway carries average traffic of 55,000 vehicles per day or about 20 million vehicle trips per year (District of Columbia 2001a, 2001b).

In addition to non-motorized recreation, the Parkway provides motorized recreational opportunities throughout the park. The principal roadways within the park are the Rock Creek and Potomac Parkway and Beach Drive. The Rock Creek and Potomac Parkway portion of the park road network extends approximately 2.5 miles from the Theodore Roosevelt Bridge in the core of the District of Columbia, north to Calvert Street. The parkway is a four-lane, paved, limited access road with a posted speed limit of 35 miles per hour. The Beach Drive portion of the park road network extends from Calvert Street, approximately 6.5 miles north to the Maryland state line. This road is a two-lane, paved road with a posted speed limit of 25 miles per hour. Beach Drive is a commuter route through the city, but also provides a pleasant experience for those who use it for that purpose. An estimated 235,000 visits per week are made to the park by people driving through the park (NPS 2003c).

Visitor Profile

Visitors to Rock Creek Park are primarily local residents of the Washington, D.C. metropolitan area. However, because it is a national park, it also is visited by people from all over the country and the world who are visiting the area. A visitor use survey conducted in 1999 found that visitors come to the park for a wide variety of reasons. The most common reasons given for visiting the park were exercise (62%), escaping the city environment (47%), time with family and/or friends (37%), and solitude (30%). Specific reasons for visiting Rock Creek Park included walking, hiking, jogging, bicycling, walking the dog, communing with or studying nature, picnicking or family reunions, golfing, in-line skating, tennis, studying history, creating art, horseback riding, and other activities (Littlejohn 1999). Rock Creek Park is a popular site in the Washington metropolitan area for birding (bird watching). According to a report from the Interior Department's U.S. Fish and Wildlife Service, 46 million birdwatchers across America spent \$32 billion in 2001 pursuing one of the nation's most popular outdoor activities (USFWS 2003). Some of the preferred areas for birding in Rock Creek Park include the areas around the nature center, stables, maintenance yard, picnic areas 17 and 18, and, in general, the western ridge of the park. Birders visit the park mostly in the spring and fall during bird migration and during the summer bird breeding season (NPS 2005a).

Overall, the majority of visitors (59%) stay 2 hours or less (Littlejohn 1999). Many visitors come to Rock Creek Park on a regular basis, with 52 percent of those surveyed visiting the park weekly (Littlejohn 1999).

Visitation Trends

Visitation to Rock Creek Park has increased almost 250% since 1973, growing from 559,000 recreational visitors in 1973 to 2,181,863 in 2006 (NPS 2007a). While this was a result of a mostly steady increase over the past 24 years, rapid growth occurred in the 1980s when recreational visitation to Rock Creek Park almost doubled, and then stabilized throughout the 1990s. In 1980 there were 1,060,000 recreational visitors. By 1989, this number had risen to 2,050,000 recreational visitors. After this growth, increases in visitation returned to more stable, pre-1980 levels (NPS 2005a, 2007a). The NPS 2007 report on visitor use indicated that 2006 had the highest recreational visitor use within the park in 20 years as shown in figure 11 (NPS 2007a). In 2006, within the main unit of Rock Creek Park, visitation to the major points of interest was as follows (R. Gunter, NPS pers. com., L. Gutman, The Louis Berger Group, Aug. 16, 2007):

- Old Stone House – 73,854
- Peirce Mill – 1,062
- Nature Center – 30,813
- Carter Barron Amphitheater – 58,064

Rock Creek Park records visitor use numbers for Reservation 339 (the main unit of the park) and its tributaries, and Rock Creek and Potomac Parkway only. Yearly visitor counts are not available for the remaining Rock Creek Park units.

In 2006, visitation trends saw most visitation occurring in the park between April and October (NPS 2007b). This is consistent with past park trends showing recreational visits to Rock Creek park occurring fairly evenly over the warmer months of spring, summer, and early fall, and dropping slightly in the late fall and winter (NPS 2005a). Non-recreational visits, which include those from commuters or others passing through the park, are distributed evenly throughout the year, with an average of 25 percent of total visits occurring each season. This is particularly true on the Rock Creek and Potomac Parkway, where traffic counts show little variation from month to month (NPS 2004d). Table 20 shows that visitation at Rock Creek Park is highest in June, July, August, and October and lowest in February (NPS 2007b).

The GMP states that, as park visitation has been rising, the park's visitor services have been severely reduced, resulting in a substantial decline in visitation to the park's interpretive centers. The result is that many visitors to Rock Creek Park never know they are in a national park and most never have contact with park rangers or receive any basic orientation (NPS 2005a).

FIGURE 11: YEARLY VISITATION NUMBERS AT ROCK CREEK PARK

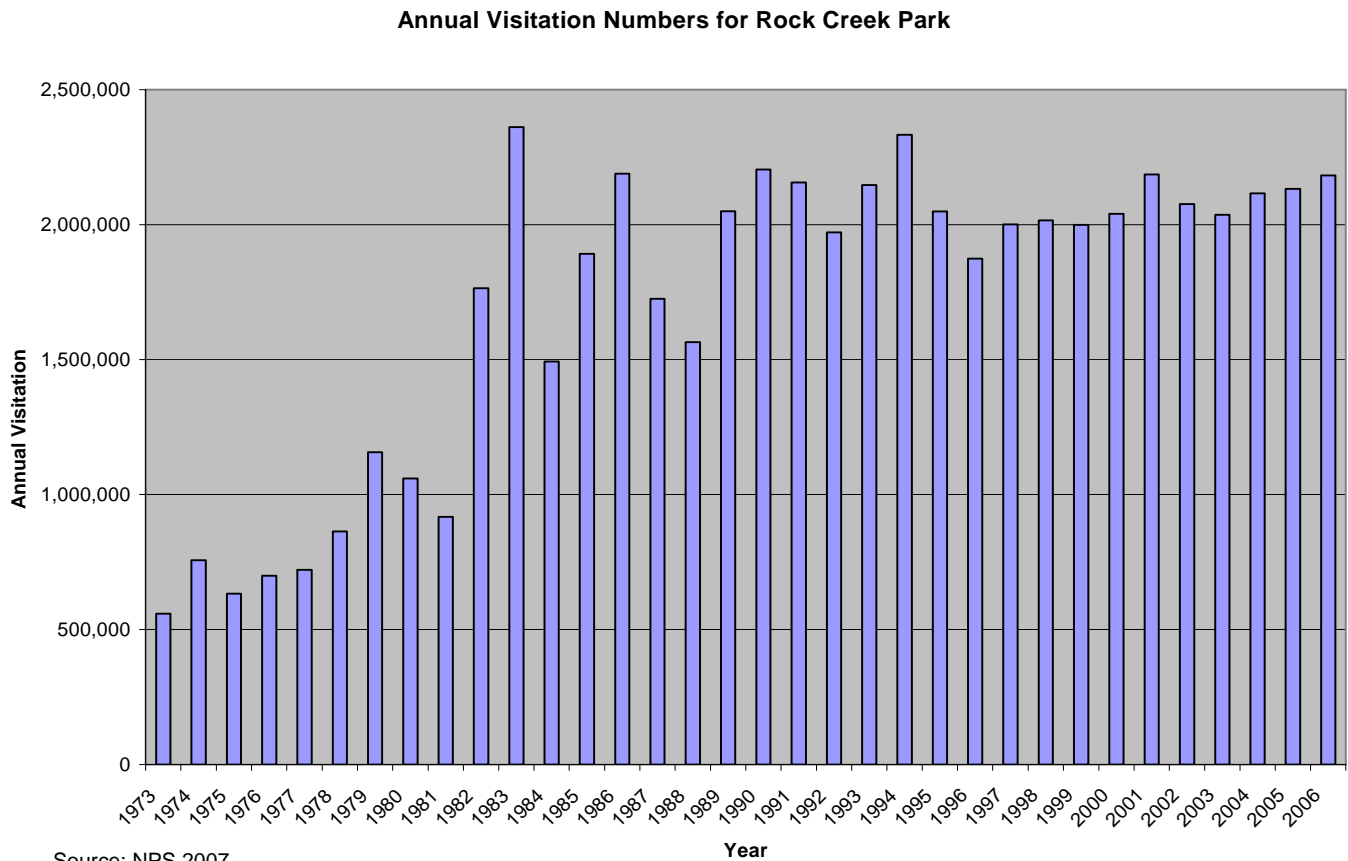


TABLE 20: MONTHLY RECREATIONAL VERSUS NON-RECREATIONAL USE OF ROCK CREEK PARK

Month	Year	Recreation Visits	Non-Recreational Visits	Total Visits
April	2006	204,358	1,015,607	1,219,965
May	2006	188,525	1,053,461	1,241,986
June	2006	229,865	1,019,036	1,248,901
July	2006	241,132	1,050,032	1,291,164
August	2006	210,701	1,053,461	1,264,162
September	2006	173,041	1,017,322	1,190,363
October	2006	228,140	1,048,318	1,276,458
November	2006	156,800	1,019,036	1,175,836
December	2006	114,827	1,050,032	1,164,859
	Totals:	2,181,863	12,381,699	14,563,562

Source: NPS 2007b

Glover-Archbold Park and Whitehaven Parkway

Glover-Archbold Park is a 183-acre “finger park” of Rock Creek Park. The park is about 2.6 miles long and 0.25 mile wide at its widest part and runs from Van Ness Street south to the Chesapeake and Ohio Canal National Historical Park. The park includes Foundry Branch and much of its valley, tributaries of the Branch, Glover Park Community Garden, a large field, and a small open area. This neighborhood park consists mainly of trails and is used mostly by local residents of the area for jogging, walking their dogs, or other forms of recreation (R. Gunter, NPS, pers. com., L. Gutman, The Louis Berger Group, July 27, 2007 and Aug. 16, 2007). White Haven is located directly adjacent to Glover-Archbold and has similar neighborhood use.

Traffic Circles and Other Small Parcels

Traffic circles and other small parcels managed by Rock Creek Park are located throughout the District of Columbia. These units are mainly located in urban areas, acting as traffic calming devices, or within city neighborhoods. Like Glover-Archbold and Whitehaven, these units are mainly used by the local residents of the area for exercise and dog walking (R. Gunter, NPS, pers. com., L. Gutman, The Louis Berger Group, Aug. 16, 2007).

SOCIOECONOMICS

Rock Creek Park is located in the District of Columbia, which has an estimated population of 581,530 (U.S. Census 2007). The study area encompasses all of the District of Columbia, as Rock Creek Park managed units are located throughout the city (refer to “Figure 1: Vicinity Map” in chapter 1). Areas around Rock Creek Park units range from mostly residential with some commercial developments, as found around Reservation 339 and the Rock Creek and Potomac Parkway; to mostly residential, as found around Glover-Archbold; to highly urban and in the middle of busy commercial areas of the city, such as traffic circles and other small parcels.

Property Values

The median property value of owner-occupied units in the District of Columbia was \$157,200 as of the 2000 Census. Between 1995 and 2005, areas around Rock Creek Park units experienced an increase in property values ranging from 2.7% (the area around the northern half of the main Rock Creek Park) to 5.8% (the area around the southern portion of the Rock Creek Park and Potomac Parkway). In the area around Glover-Archbold and White Haven, home values increased by 5.2% during that time period (Neighborhoodinfo DC 2007a). Although home prices are increasing, sales of single-family homes throughout the city have declined overall, and were down 11.6% in the third quarter of 2006 from the prior year (Neighborhoodinfo DC 2007b).

The demand for WTF is growing and adjacent property owners and neighbors of proposed facility sites have often opposed their construction, citing aesthetic and health concerns, and alleging a consequent decrease in property values. Such opposition has primarily targeted facilities located in residential zones, where such facilities do not generally match the character of the surrounding structures (McDonough 2003).

Public Finance

Fiscal considerations are those having to do with the public treasury or revenues. Potential fiscal impacts could, but do not always, include the following:

- Removal or addition of a property (i.e., project site) from the public tax rolls;
- Acquisition of a property through use of public funds; and
- Other public expenditures related to the proposed action (i.e., utility connections).

Rock Creek Park is a federally owned property and is not subject to federal or local taxes. Facilities located in the park pay costs associated with the application process, as well as yearly fees. For the existing WTF in the park, Verizon Wireless paid the NPS application fees during the 1998 permitting process. In addition, Verizon Wireless permit required them to pay \$60,000 per annum, increased 3% annually, which represents \$30,000 per annum for each Rock Creek Park WTF site. When the permit was renewed in 2004, the combined fee for both sites was \$69,556, to be increased 3% annually. In 2006, the permit fee for both sites combined was approximately \$73,800 (A. Applewhaite-Coleman, NPS, pers. comm., L. Gillham, NPS Oct. 26, 2007).

HUMAN HEALTH AND SAFETY

The NPS is committed to providing appropriate, high-quality opportunities for visitors and employees to enjoy the parks in a safe and healthful environment. Further, the NPS will strive to protect human life and provide for injury-free visits. Human health and safety concerns associated with a wireless telecommunication plan include: exposure to radiofrequency electromagnetic fields; the ability of cellular phone users to reach 911 for emergency services; and the potential for increased traffic accidents related to cell phone use while driving.

Radiofrequency Emissions

Electromagnetic fields are produced by the local build-up of electric charges including those generated by human-made sources such as X-rays, television antennas, or telecommunications towers. These fields are present everywhere, but are invisible to the human eye. Included in this range of electric charges is radiofrequency energy, a type of radio wave. These waves are measured by their frequency, or the

number of waves passing a given point in one second. When discussing radiofrequency signals, this frequency measurement is referred to a hertz (Hz). One Hz equals 1 wave per second, 1 kilohertz (kHz) equals 1,000 waves per second, 1 megahertz (MHz) equals 1 million waves per second, and 1 gigahertz (GHz) equals 1 billion waves per second. Radiofrequency energy includes waves with frequencies ranging from 3 kHz to 300 GHz. The Federal Communications Commission authorizes and licenses most radiofrequency services, facilities, and devices used by the public, industry, and state and local government organizations (FCC 2007).

The spectrum of electromagnetic radiation includes radio waves and microwaves, collectively referred to as radiofrequency, emitted by transmitting antennas. The level of radiofrequency emissions varies, with microwave towers emitting about 1,000 MHz while cellular towers emit 800 to 900 MHz. Broadcast television towers can emit 50,000 watts (E. Mantiply, FCC, pers. comm. to D. Otto, The Louis Berger Group Inc., Dec. 19, 2002).

Radiation from radiofrequency waves is classified as non-ionizing radiation, which, even at high intensities, cannot cause ionization (molecular changes that can lead to damage in biological tissue in a biological system. Other types of non-ionizing radiation include visible light, infrared radiation, and other forms of electromagnetic radiation with relatively low frequencies (FCC 2007). Non-ionizing radiation may produce other biological effects that sometimes, but not always, lead to adverse health effects. A biological effect occurs when exposure to electromagnetic waves causes some noticeable or detectable physiological change in a biological system, but this change is not always adverse (WHO 1998). The World Health Organization and Federal Communications Commission (FCC) report that the levels of radiofrequency that people are normally exposed are much lower than those needed to produce significant heating (WHO 2003; FCC 2007).

In the case of radiofrequency emissions from WTF, the World Health Organization states that measurements made near typical cellular installations, especially with tower-mounted antennas, have shown ground-level power densities thousands of times less than the FCC limits for safe exposure (WHO 2003). The limits established by the FCC are designated to protect the public health with a large margin of safety. These limits were based on recommendations from the National Council on Radiation protection and the Institute of Electrical and Electronics Engineers, the FCC developed guidelines for human exposure to radiofrequency fields (FCC 2007). Radiofrequency emissions are measured by considering the radiofrequency field and measuring how much radiofrequency energy is absorbed in a body, known as the Specific Absorption Rate (SAR). These measurements would be taken into consideration with the background radiofrequency emission levels, or levels before facilities are constructed. Background radiofrequency emission levels depend on numerous variables including topography, location of surrounding wireless telecommunication facilities, and type of existing facilities (television, etc.). In general, the background radiofrequency emission level would be caused by other WTF or television broadcast facilities in the area. It is likely that the majority of background emissions would be from television broadcasters (D. Hardman, WFI, pers. comm., to D. Otto, Louis Berger Group, Jan. 29, 2003).

In January 2003, studies were conducted at the two existing facilities in Rock Creek Park towers to determine existing levels of radiofrequency emissions as part of the 2003 EA process. Emission levels were recorded as a percent of the maximum permissible exposure (MPE) limit, with 100% representing the threshold of the limit for both a controlled and uncontrolled environment. Pursuant to FCC regulations, an uncontrolled environment was defined as a situation in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. This category would include the general public and workers in the vicinity of the maintenance yard and tennis center.

Since the monopoles that were measured were not enclosed with a fence, all areas surrounding these facilities were considered an uncontrolled environment (WFI 2003a, 2003b).

At the maintenance yard site, the maximum emission level for a controlled environment measured was 5.5% of the applicable MPE limit as recorded on the monopole at 125 feet above ground level. The maximum emission level for an uncontrolled environment was recorded at 10.5% of the applicable MPE limit southwest of the monopole measured on the ground. At the tennis center site, the maximum emission level for a controlled environment measured was 11.4% of the applicable MPE limit as recorded on the monopole at 95 feet above ground level. The maximum emission level for an uncontrolled environment was recorded at 12% of the applicable MPE limit in the area west of the covered tennis courts measured on the ground. The radiofrequency emission levels measured at both existing sites, for both controlled and uncontrolled environments, were well below the applicable MPE limits (WFI 2003a, 2003b).

Emergency Services

During the GMP process, the public commented that sometimes they feel unsafe within the park, specifically in the main Rock Creek Park and Rock Creek and Potomac Parkway. Commenters further stated that these concerns could influence where they choose to recreate in the park (NPS 2005a). Although concerns with crime were expressed, these concerns were not tied to the use of cellular phones. The GMP process identified the following Optimum Conditions related to Visitor Use and Experience that influence health and safety:

- A safe healthful environment is provided for visitors and employees. Management actions strive to protect human life and provide for injury-free visits.
- Park visitors assume a substantial degree of risk and responsibility for their own safety when visiting areas that are managed and maintained as natural, cultural, or recreational environments.
- Effective law enforcement occurs as part of a cooperative community effort. The park encourages and assists park neighbors in the development of cooperative crime prevention and detection programs.

Various statistics are available concerning the use of cellular phones to access emergency services. The Cellular Telecommunications and Internet Association (CTIA) estimates that in 2001, 155,835 calls were made daily to 911 by cellular phones (CTIA 2002b). The National Emergency Number Association estimates that 30% of the 150 million calls placed to 911 in 2000 were made by cellular phone users (NENA 2002). A national survey conducted by Peter D. Hart Research Associates, Inc. in 1996 found that more than 60% of cellular customers have used their wireless telephones in cases of car trouble, medical emergencies, accidents, or to report crimes or drunk drivers. The Federal Communications Commission states that many cellular 911 calls are made by “Good Samaritans” and believes that prompt delivery of cellular 911 calls to public safety organizations benefits the public at large by promoting safety of life and property. Since these studies, the FCC now estimates that the number of 911 calls from wireless phones has doubled since 1995, to over 50 million per year, which is consistent with the National Emergency Number Association estimates in 2000. The Federal Communications Commission further estimates that 30% of 911 calls made are from wireless phones (FCC 2006).

All emergency calls made in the District of Columbia and Rock Creek Park are received at the Public Safety Communications Center of the D.C. Metropolitan Police. If a situation occurring within the park demands immediate attention or is life threatening, an officer from the Metropolitan Police is assigned. In non-life threatening situations, a dispatcher from the center will contact U.S. Park Police to address the situation. Because emergency calls are not directly received by the U.S. Park Police, the NPS does not

have data concerning the number and nature of calls made within Rock Creek Park (Lt. Burkes, U.S. Park Police, pers. comm., L. Gutman, The Louis Berger Group, August 23, 2007). In the future, if WTF are located in areas within the park, but close to the Maryland state line, it is possible that emergency calls from these facilities could be directed toward a Maryland call center.

During the siting of the two existing facilities in the main unit of Rock Creek Park, several agencies expressed concern for the public safety and cellular communications. The U.S. Park Police uses cellular phones with Nextel service. They further rely on wireless telecommunications to operate within the Capital Wireless Integrated Network (CapWIN). The CapWIN project is a partnership between Maryland, Virginia, and the District of Columbia to develop an integrated transportation and criminal justice information wireless network. The project includes in-car mobile computer systems that allow messaging between police vehicles in the three jurisdictions, providing a mobile command center in each U.S. Park Police vehicle. Currently the U.S. Park Police have CapWIN systems through three in-car mobile command systems and two hand held systems, with plans to add two more in-car systems. The CapWIN system operates using Verizon or AT&T wireless services. U.S. Park Police note that operation of these systems requires the current WTF in the park and in areas where there is not in-car coverage, officers cannot always operate the CapWIN. Future technologies to be employed by the U.S. Park Police will include video systems in the cars that transmit the video to other cars and the Incident Management Analysis and Reporting System (IMARS). The IMARS system will allow officers to file reports electronically from the street so that they do not have to come back into the office to file reports. Both of these technologies will require WTF to provide the necessary service to operate (Lt. Mullholland, U.S. Park Police, pers. comm., L. Gutman, The Louis Berger Group, Aug. 27, 2007).

The FCC has implemented a phased program for a program known as E-911. The E-911 program seeks to improve the effectiveness and reliability of wireless 911 service by providing 911 dispatchers with additional information on wireless 911 calls. Phase I of this program required telecommunications providers to report the telephone number of a wireless 911 caller and the location of the antenna that received the call. Phase I went into effect on April 1, 1998, or within 6 months of a request by the designated Public Safety Answering Point, whichever was later. Phase II calls for technology that reports the telephone number of a wireless 911 caller to the 911 dispatcher and provides precise location information (within 50 to 100 meters) of the caller (FCC n.d.). This capability requires the development of new technologies and upgrades to local 911 Public Safety Answering Points, as well as coordination among public safety agencies, cellular carriers, technology vendors, equipment manufacturers, and local wire line carriers. The implementation dates of Phase II of E-911, set by the FCC, establish a 4-year rollout schedule beginning October 1, 2001 and ending December 31, 2005. As this deadline has passed, the FCC has granted waivers for some tier III (non-nationwide commercial mobile radio service providers with no more than 500,000 subscribers as of the end of 2001), to extend this deadline due to technical or economical difficulties in meeting these standards (FCC 2005).

For the 2003 EA, the engineering assessment (see appendix B) recorded signals from existing towers and classified the signals based on industry standards identified for compliance with the E-911 standard of -85 dBm. Signal levels were classified in four categories: in building (0 dBm to negative [-] 75 dBm), in-car (negative [-] 75 dBm to negative [-] 85 dBm), on street (negative [-] 85 dBm to negative [-] 100 dBm), and no coverage (negative [-] 100 dBm to negative [-] 120 dBm). A signal strength classified as in building can receive and send calls from within a building, in a car, or on the street. A signal strength classified as in car can receive and send calls from within a car or on the street, but not within a building. The on-street signal strength only allows the user to send and receive calls from on the street and would not provide coverage from within a building or car. The in-building and in-car classifications are compliant with E-911 standards. This test showed that coverage in the majority of Rock Creek Park in the study area, before the two existing facilities were in place, did not meet the E-911 standards. The following locations in and around Rock Creek Park were classified as below the E-911 standards without

the two WTF located in the park: Beach Drive, Military Road, Broad Branch Road, north of Military Road between Oregon Avenue and Beach Drive, Ross Drive south of Military Road, and Glover Road and Beach Drive south of Military Road. These sites are within the identified coverage gap for Verizon Wireless customers. Further models run for the 2007 Coverage Gap Analysis for all the units of Rock Creek Park confirmed these findings, showing the above stated areas not meeting in-car service (refer to figure 9 in chapter 2) (Cityscapes 2007).

Accidents

In addition to the ability to reach emergency services, another issue related to cellular phone use in all units of Rock Creek Park is the potential for an increase in automobile accidents by distracted drivers. Units of Rock Creek Park are located throughout D.C., with the majority of these units have existing cellular coverage. The most prominent coverage gaps within Rock Creek Park units are present in the main unit of Rock Creek Park (Reservation 339) and its tributaries, as well as along the Rock Creek and Potomac Parkway (NPS 2003c). With a work force of approximately 260,844 in the city (U.S. Census 2000), many living in the area around these units, as well as others in the District of Columbia and Maryland, drive through the roads in the main units of Rock Creek Park to reach their place of employment. Rock Creek Park itself is an urban park that serves a wide variety of users. Given its unique setting in the northern portion of Washington, D.C. and the extensive road network that runs through the park, it is also a popular commuter route for people in the surrounding neighborhoods and Maryland. Beach Drive bisects the park lengthwise and serves approximately 9,000 cars per day (Robert Peccia and Associates 1997).

There is a widespread belief that the use of cellular telephones while driving may increase the possibility for a collision, as shown by some studies. One such study, conducted by the New England Journal of Medicine, examined 699 drivers who had cellular telephones and who were involved in motor vehicle collisions resulting in substantial property damage, but no personal injury. This study concluded that the use of cellular telephones in motor vehicles is associated with a quadrupling of the risk of a collision during the brief period of the call (Redelmeier and Tibshirani 1997). A study by the AEI-Brookings Joint Center estimates that several hundred people die each year due to collisions involving cellular phone use. However, this study also conducted an economic analysis of cell phone bans and concluded that the net benefit of regulations banning cell phones would not be significant (Hahn et al. 2000). The AEI-Brookings Joint Center followed up on this research and in 2006 released new findings that indicated previous studies may have overstated the number of accidents caused by cell phone use by 36%. This study differed from previous efforts in that the sample included cell phone and non-cell phone users, as well as those drivers that were in accidents and those that were not. The study further concluded that there would be no statistically significant reduction in accidents from implementing a ban on cell phones when driving (Hahn and Prieger 2006).

The District of Columbia has banned the use of hand held cell phones while driving since July 1, 2004. Since this ban was enacted the District of Columbia has issued a total of 22,643 citations for using a hand held cellular phone while driving, which included 3,272 in 2004 (from August to December), 7,523 in 2005, 8,358 in 2006, and 3,490 (from January to May) in 2007 (District of Columbia n.d.).

In the absence of specific data on automobile accidents in Rock Creek Park caused by a cell phone, historical and current general automobile accident data from the park were evaluated. A 1997 report entitled Transportation Study, Rock Creek Park Washington, D.C. analyzed accidents on park roads between January 1, 1993 and December 31, 1995. This study stated that the greatest safety problems on park road were excessive vehicle speed and aggressive driving tendencies. Among the recorded accidents, almost 56% occurred on the Rock Creek and Potomac Parkway, 25% were on Beach Drive, and 19% were on other park roads. Over 92% of these accidents involved collisions with other cars, or collisions

with objects such as poles, signs, trees, guardrails, rocks, bridges, ditches, or animals. Along Beach Drive, collisions with pedestrians or bicyclists accounted for 4.4% of traffic accidents. This number was lower on other park roads (1.8%) and the Rock Creek and Potomac Parkway (1.7%). In 2002, 130 automobile accidents were reported in the park (Sgt. Godfrey, U.S. Park Police, pers. comm., L. Gutman, LBG Feb. 27, 2003).

PARK MANAGEMENT AND OPERATIONS

Park staff currently involved with the processing of applications for wireless telecommunication facilities includes the park Superintendent, Deputy Superintendent, and resource specialists as needed. For certain parts of the process the park also receives assistance from staff at the National Capital Region. To date, the park has only completed the process for telecommunication right-of-way permits for the two Verizon facilities located at the maintenance yard and tennis center.

As this was the first effort conducted by the park and was considered controversial, Rock Creek Park does not consider this to represent the typical effort for park staff in the processing of these types of permit applications. Typically, the application process begins with a phone inquiry by the applicant that usually leads to a preliminary meeting. In this preliminary meeting, the park Superintendent and/or Deputy Superintendent describe the application process to the potential applicant and provide information they might require for their application, including a tour of Rock Creek Park. This meeting can last between one and four hours, and is followed by up to four hours of park staff time following up on any information requests the applicant might have had. Currently, the park has only had initial inquiries for applications, which have ranged from just a phone call to five preliminary meetings with the park (C. Cox, ROCR, pers. com, L. Gutman, July 20, 2007 and July 26, 2007). If an application were to proceed beyond the preliminary meeting stage, the time required by the park would be directed by the RM-53 timeline, as outlined in the no-action alternative description in "Chapter 2: Alternatives."

ENVIRONMENTAL CONSEQUENCES

GENERAL METHODOLOGY FOR ASSESSING IMPACTS

The general approach for establishing impact thresholds and measuring the effects of the alternatives on each resource category includes the following elements:

- General analysis methods as described in guiding regulations
- Basic assumptions used to formulate the specific methods used in this analysis
- Thresholds used to define the level of impact resulting from each alternative
- Methods used to evaluate the cumulative effects of each alternative in combination with unrelated factors or actions affecting park resources
- Methods and thresholds used to determine if impairment of specific resources would occur under any alternative or if any unacceptable impacts would occur

GENERAL ANALYSIS METHODS

The analysis of impacts follows CEQ guidelines and Director's Order #12 procedures (NPS 2001) and is based on the underlying goal of protection of the park's natural and cultural resources. This analysis is not site-specific, but looks at all Rock Creek Park managed units and the possibility for right-of-way permit applications for WTF in the Rock Creek Park units and zones identified for each alternative. The analysis applies the results of known data and the best available scientific literature applicable to the region and setting, and the actions being considered in the alternatives.

The interdisciplinary planning team created a process for impact assessment, based upon the directives of the *Director's Order #12 Handbook* (sec. 4.5(g)). NPS units are directed to assess the extent of impacts on park resources as defined by the context, duration, and intensity of the effect. While measurement by quantitative means is useful, it is even more crucial for the public and decision-makers to understand the implications of those impacts in the short- and long-term, cumulatively, and within context, based on an understanding and interpretation by resource professionals and specialists. With interpretation, one can ascertain whether certain impact intensity to a park resource is "minor" compared to "moderate" or "major" and what criteria were used to come to that conclusion.

To determine impacts for each resource topic, methodologies were identified to measure the change in park resources that would occur with the implementation of the alternatives. Thresholds were established for each impact topic to help understand the severity and magnitude of changes in resource conditions of the various management alternatives.

Potential impacts are described in terms of type (Are the effects beneficial or adverse?), context (Are the effects site-specific, local, or even regional?), duration (Are the effects short-term or long-term), and intensity (Are the effects negligible, minor, moderate, or major?). Because definitions of intensity (negligible, minor, moderate, or major) vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this document.

Each alternative is compared to a baseline to determine the context, duration, and intensity of resource impacts. For purposes of impact analysis, the baseline is the process the park currently uses to evaluate applications for WTF (see "Chapter 2, Alternatives" for a complete description of alternative A). This is sometimes referred to the "No-Action or Existing Management Continued" alternative. The action

alternatives are then compared against alternative A to determine the relative change or effect to park natural and cultural resources, visitor experience, human health and safety, and other impact topics. In the absence of quantitative data, best professional judgment is used to determine impacts. In general, the impact thresholds were developed from existing literature, federal and state standards, and consultation with subject matter experts and appropriate agencies.

For the purposes of analysis, the following assumptions are used for all impact topics:

Direct Impacts: Direct impacts are those that are caused by, or connected to the evaluation of right-of-way permit applications for WTF by the park and the construction, operation, and maintenance of WTF for which a permit is granted. For example, vegetation may have to be removed at the construction site for a WTF.

Indirect Impacts: Indirect impacts are those that are further removed from the action or activity either geographically or through time. For example, there may be indirect effects to the views from areas outside of the park from WTF.

Duration: The duration of an impact varies according to the resource area evaluated. Therefore, the following is an example and the duration is defined under each impact topic.

Short-term Impacts: Those impacts occurring over the course of one year or less. Some short-term impacts could occur over several days or could be for several months, such as during construction of a facility.

Long-term impacts: Those impacts occurring over several years, such as the operation and maintenance of WTF.

Study Area: Each resource impact is assessed in direct relationship to those resources affected both inside and outside the park, to the extent that the impacts can be substantially traced, linked, or connected to the proposed action. Each impact topic, therefore, has a study area relative to the resource being assessed, and it is further defined in the impact methodology.

CUMULATIVE IMPACTS

The CEQ regulations to implement NEPA require the assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR Part 1508.7).

Cumulative impacts are considered for all alternatives, including the no-action alternative. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects and plans in all Rock Creek Park units and, if applicable, the surrounding region. Table 21 summarizes these actions that could affect the various resources at the park. These actions are described in more detail in the “Related Policies, Laws, Plans, and Actions” section of this document (see “Chapter 1: Purpose of and Need for Action”).

The analysis of cumulative effects was accomplished using four steps:

Step 1—Resources Affected. Fully identify resources affected by any of the alternatives.

Step 2—Boundaries. Identify an appropriate spatial boundary for each resource.

Step 3—Cumulative Action Scenario. Determine which actions to include with each resource.

Step 4—Cumulative Impact Analysis. Summarize the cumulative impact, which is the effects of the proposed action plus other actions effecting the resource; defining context, intensity, duration and timing; defining thresholds, methodology, etc.

TABLE 21: CUMULATIVE IMPACT SCENARIO

Impact Topic	Study Area	Past Actions	Current Actions	Future Actions (life of WTF plan/EA)
Wildlife and Wildlife Habitat (flora and fauna, species of special concern, and avian species)	Rock Creek Park unit boundaries, and the DC metropolitan area for species of special concern	Resource Management Plan Development of the GMP for Rock Creek Park and the Rock Creek and Potomac Parkway and the Fort Circle Parks and associated RODs 2003 WTF EA Woodrow Wilson Fish Barrier Removal Project District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park	Exotic Plant Management Plan White-tailed Deer Management Plan/EIS Metropolitan Branch Trail EA Rehabilitation of Rock Creek and Potomac Parkway Fire Management Plan EA Canopy Trail EA District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program) Effect of Cell Towers on Birds and Bats Study Existing WTF in the park	Implementation of the Exotic Plant Management Plan, White-tailed Deer Management Plan, Metropolitan Branch Trail, Canopy Trail EA, District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program)
Air Quality	District of Columbia EPA defined airshed	District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program) Daily vehicle use Existing WTF in the park	District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program) Daily vehicle use	Relocation of the U.S. Park Police D-3 Facility District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program) Daily vehicle use
Soundscapes	Rock Creek Park unit boundaries and adjacent lands	District Department of Transportation Projects (Kingle Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park	Activities at Carter Barron Amphitheatre	Relocation of the U.S. Park Police D-3 Facility

Impact Topic	Study Area	Past Actions	Current Actions	Future Actions (life of WTF plan/EA)
Cultural Resources -Historic Structures -Archeological Resources -Landscapes	Rock Creek Park unit boundaries, for landscapes includes viewsheds outside park boundaries	Development of the General Management Plan Development of Cultural Landscape Reports (Meridian Hill, Dumbarton Oaks, Montrose) Replacement of Nature Center Roof and Klinge Mansion Stonework District Department of Transportation Projects (Klinge Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park	Parkwide Archeological Surveys Peirce Mill Rehabilitation District Department of Transportation Projects (Klinge Road, Corridor Studies, Capital Improvement Program) Tregaron Estates Development	Relocation of the U.S. Park Police D-3 Facility Renovation of Carter Barron Amphitheatre District Department of Transportation Projects (Klinge Road, Corridor Studies, Capital Improvement Program)
Visitor Use and Experience	Rock Creek Park unit boundaries	Replacement of Nature Center Roof and Klinge Mansion Stonework Tennis Tournaments Activities at Carter Barron Amphitheatre Trail Maintenance District Department of Transportation Projects (Klinge Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park	Peirce Mill Rehabilitation Tennis Tournaments Activities at Carter Barron Amphitheatre Trail Maintenance District Department of Transportation Projects (Klinge Road, Corridor Studies, Capital Improvement Program) Development of Georgetown Waterfront Park Tregaron Estates Development	Relocation of the U.S. Park Police D-3 Facility Tennis Tournaments Activities at Carter Barron Amphitheatre Trail Maintenance District Department of Transportation Projects (Klinge Road, Corridor Studies, Capital Improvement Program)
Socioeconomics	Rock Creek Park unit boundaries and adjacent neighborhoods	Tennis Tournaments Establishment of WTF in the park Existing WTF in the park	Tennis Tournaments Development of Georgetown Waterfront Park Tregaron Estates Development	Tennis Tournaments Relocation of the U.S. Park Police D-3 Facility

Impact Topic	Study Area	Past Actions	Current Actions	Future Actions (life of WTF plan/EA)
Human Health and Safety	Rock Creek Park unit boundaries	District Department of Transportation Projects (Kling Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park Automobile accidents not related to cell phone use Other WTF and radio and television broadcast facilities in the area	Conversion of NPS Radio Systems to Digital Narrow Band Technology District Department of Transportation Projects (Kling Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park Automobile accidents not related to cell phone use Other WTF and radio and television broadcast facilities in the area	Relocation of the U.S. Park Police D-3 Facility District Department of Transportation Projects (Kling Road, Corridor Studies, Capital Improvement Program) Existing WTF in the park Automobile accidents not related to cell phone use Other WTF and radio and television broadcast facilities in the area
Park Management and Operations	Rock Creek Park unit boundaries	Tennis Tournaments Activities at Carter Barron Amphitheatre Routine Maintenance Hazard Tree Removal Trail Maintenance Existing WTF in the park	Tennis Tournaments Activities at Carter Barron Amphitheatre Routine Maintenance Hazard Tree Removal Trail Maintenance	Relocation of the U.S. Park Police D-3 Facility Tennis Tournaments Activities at Carter Barron Amphitheatre Routine Maintenance Hazard Tree Removal Trail Maintenance

Many of the past, present, and future actions outlined in table 21 are described in the “Related, Laws, Policies, Plans, and Actions” section in chapter 1.

IMPAIRMENT ANALYSIS

The *NPS Management Policies 2006* require an analysis of potential effects to determine whether actions would have the potential to impair park resources. The fundamental purpose of the NPS, as established by the Organic Act and reaffirmed by the Redwood National Park Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park resources and values. However, the laws do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the NPS the management discretion to allow certain impacts within a park system unit, that discretion is limited by the statutory requirement that the agency must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values.

An impact would be more likely to constitute impairment, a subset of a major impact, to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;

- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park.

The following process was used to determine whether the alternatives had the potential to impair park resources and values:

1. The park's enabling legislation, the GMP, the Strategic Plan, and other relevant background were reviewed with regard to the unit's purpose and significance, resource values, and resource management goals or desired future conditions.
2. Management objectives specific to resource protection goals at Rock Creek Park units were identified.
3. Thresholds were established for each resource of concern to determine the context, intensity and duration of impacts, as defined above.
4. An analysis was conducted to determine if the magnitude of impact reached the level of "impairment," as defined by NPS Management Policies.

The impact analysis includes any findings of impairment to park resources and values for each of the alternatives.

UNACCEPTABLE IMPACTS

The *NPS Management Policies 2006* require parks to address "unacceptable impacts" in their NEPA analysis. The evaluation of unacceptable impacts addresses the concept that, while an impact may not reach the level of impairment, it would still not be acceptable within a park's particular environment. Section 1.4.7.1 states that unacceptable impacts are those, "that, individually or cumulatively, would:

- Be inconsistent with the park's purpose or values, or
- Impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- Create an unsafe or unhealthful environment for visitors or employees, or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- Unreasonably interfere with:
 - Park programs or activities, or
 - An appropriate use, or
 - The atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park.
 - NPS concessioner or contractor operations or services."

NATURAL RESOURCES

WILDLIFE AND WILDLIFE HABITAT (FLORA AND FAUNA, SENSITIVE SPECIES, AND AVIAN SPECIES)

Flora and Fauna

Guiding Regulations and Policies

Service-wide NPS regulations and policies, including the NPS Organic Act of 1916, *NPS Management Policies 2006* (NPS 2006), and the NPS RM-77, Natural Resource Management direct national parks to provide for the protection of park resources. The Organic Act directs national parks to conserve wildlife unimpaired for future generations and is interpreted to mean that native animal life is to be protected and perpetuated as part of a park unit's natural ecosystem. Parks rely on natural processes to control populations of native species to the greatest extent possible. Native species are generally protected from harvest, harassment, or harm by human activities. The *NPS Management Policies 2006* state that the NPS will maintain as parts of the natural ecosystems of parks all native plants and animals (sec. 4.4.1). The NPS will achieve this by:

- preserving and restoring the natural abundance, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and communities and ecosystems in which they occur;
- restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
- minimizing human impacts on native plants, animal populations, communities, and ecosystems, and the processes that sustain them.

Policies in the *NPS Natural Resources Management Guidelines* state, “the National Park Service will seek to perpetuate the native animal life as part of the natural ecosystem of parks” and that “native populations will be protected against... destruction... or harm through human actions.”

The purpose of Rock Creek Park is to “to provide for recreation that is compatible with the park and to protect its natural and cultural resources.” In addition, the park's enabling legislation calls for retaining timber, animals and curiosities in as natural condition as possible. The GMP management requirement for flora and fauna indicates that native plant and animal species function in as natural a condition as possible, except where special management considerations are allowable under policy.

Methodology and Assumptions

The following describes the methodology used to evaluate the impacts of the proposed alternatives on wildlife and wildlife habitat at Rock Creek Park. This discussion focuses on general wildlife and wildlife habitat areas, such as uplands (forested, meadows, and urban landscape) and riparian areas and incorporates the best available research related to the construction, operation, and maintenance of WTF and the effect on wildlife and wildlife habitat, specifically migratory birds.

Data used in the analysis were collected from available literature and park staff. Analysis of potential impacts to flora and fauna species was based on the potential for species that are likely to occur in habitats at and in the vicinity of any future WTF. It is assumed that due to the urban setting of the park,

the majority of wildlife and wildlife habitat has received some amount of disturbance associated with human activities.

Study Area

The study area for assessment of alternatives includes all 99 administered units of Rock Creek Park; however the focus of the analysis is on the largest unit of Rock Creek Park (Reservation 339) and the Rock Creek and Potomac Parkway.

Impact Thresholds

- Negligible:** There would be no observable or measurable impacts to native species, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.
- Minor:** Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, but would not be outside the natural range of variability. Occasional responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors might occur. However, some impacts might occur during critical reproduction periods or migration for a species, but would not result in injury or mortality. Sufficient habitat in the park would remain functional to maintain the viability of the species in the park.
- Moderate:** Impacts on native species, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating or other factors affecting local population levels. Some impacts might occur in key characteristics of habitat in the park. However, sufficient population numbers or habitat in the park would remain functional to maintain the viability of the species in the park.
- Major:** Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in park population levels. Impacts would occur during critical periods of reproduction or in key habitats in the park and result in direct mortality or loss of habitat that might affect the viability of a sensitive species. Local population numbers, population structure, and other demographic factors might experience large declines.
- Impairment:** The action would contribute substantially to the deterioration of native species in Rock Creek Park units to the extent they would no longer function as a part of the natural system. In addition, some of these adverse major impacts on the park's resources and values would
 - contribute to deterioration of the park's native flora and fauna and values to the extent that the purpose of Rock Creek Park units would not be fulfilled as established in its enabling legislation;

- affect resources key to the natural or cultural integrity or opportunities for enjoyment in Rock Creek Park units; or
- affect the resource whose conservation is identified as a goal in the GMP (NPS 2005a) or other planning documents for Rock Creek Park.

Duration:

Short-term effects would be one to two growing seasons for native plant species. Long-term effects would be anything beyond two growing seasons. Short-term effects would be one to two breeding seasons for native fauna species.

Long-term effects would be anything beyond two breeding seasons.

Impacts of Alternative A: No-Action Alternative

Analysis. In alternative A, applications for WTF would be evaluated by NPS, subject to the application process under RM-53 and evaluated using the park's GMP and other management documents, as is the current situation. For applications that are approved, WTF sites would include the antenna support structure, access roads or driveways, trenching infrastructure (buried electric lines and fiber optic cable), and equipment cabinets. No fencing would be permitted around facilities or their associated structures.

Long-term beneficial impacts to flora and fauna would be expected because applications for facilities would not be granted, under any circumstances, in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park for the reasons outlined in the "Elements Common to All Alternatives" section in chapter 2. Wildlife and associated habitat would remain intact in these areas and disturbance from noise and human presence, if any, would be maintained at current levels.

Based on the dimensions of the two existing WTF in Rock Creek Park, potential direct impacts to vegetation could occur as a result of disturbance in an area of approximately 30 by 30 feet for the antenna support structure and equipment cabinet and areas associated with equipment used for maintenance on the facilities. Occasional pruning of trees and shrubs near the facilities would be necessary to minimize potential for damage to the facilities and to provide clear access for maintenance. Pruning would be expected to be conducted in a manner to minimize potential for impacts to vegetation and would be expected to have long-term negligible adverse impacts.

Short-term minor adverse impacts to vegetation and wildlife would be expected as a result of facility construction as part of the no-action alternative. Construction of a WTF and any associated staging area would create ground disturbance, compact soil, and require the removal of vegetation to accommodate the antenna support structure and associated structures, resulting in a temporary loss of vegetation and habitat for some species in the vicinity of the WTF until reclamation of the construction area takes place, as required by the applicable authorities. Construction activities would also create noise disturbance and bring an increased human presence, which would result in displacement of wildlife from the construction area to other temporary, possibly less suitable habitats. Once construction is over and reclamation of the site has occurred, species would be expected to resume using the habitat around the facilities, if suitable habitat is available. These changes would be highly localized, temporary, and would not be expected to influence the viability of the species within the park.

Long-term minor adverse impacts, although highly localized, would be expected to occur from operation and maintenance of any potential new WTF. Permanent habitat loss would result from the actual footprint of the antenna support structure and associated structures. In addition, construction of facilities could result in the creation of new edge habitats, which could create new habitat for non-native plant species and result in competition with native species, as well as habitat degradation. Operation of facilities would disrupt habitat as a result of the physical location of the structure and associated access roads or driveways. The location of these facilities would not only result in the loss of available habitat where the facility and support building are located, but would also result in habitat fragmentation. Impacts to species sensitive to low levels of repetitive noise, such as frogs and some birds, would occur from operation of cooling fans in the equipment buildings and occasional testing of emergency generators. Based on the operation of the existing WTF, it is expected that the cooling fans would cycle up to every two minutes and stay on for up to two minutes, resulting in frequent displacement of some wildlife species from habitat in the vicinity of the equipment buildings during that time period. Intermittent temporary wildlife displacement from maintenance workers at the site would also occur for those species sensitive to human disturbance. Although these species would experience disturbance, any changes to the species would not be outside the natural range of variability and would not be expected to result in injury or mortality.

For any co-location, the disturbance footprint would be only that needed for the supporting equipment shed and trenching to add additional infrastructure, if needed, not for the entire facility. During operations, impacts of operations and maintenance of co-located facilities would be the same as described above, except there would be greater noise disturbance concentrated in those areas with co-location as noise from multiple cooling fans, emergency generators, and human disturbance from maintenance would be from multiple equipment buildings instead of just one. Although noise and human disturbance would increase, less ground disturbance is possible as it is unlikely that new access roads or driveways would be needed at existing facilities.

Because there are only two WTF (tennis center and maintenance yard) currently within the park, impacts from radiofrequency emissions to the park's wildlife would be expected to be long-term negligible adverse if new facilities are co-located on one of the existing WTF. The potential construction of new WTF would create additional sources of radiofrequency emissions that could affect wildlife; however, effects would be expected to be negligible, because the adjacent urban area contains existing WTF, radio towers, television facilities, other types of emissions and any addition is expected to be relatively small compared to the background levels of emissions in an urban setting. In addition, any new WTF would comply with FCC exposure regulations.

Cumulative Impacts. Long-term moderate adverse cumulative effects to flora and fauna would be expected as a result of past, present, and reasonably foreseeable actions occurring within the park and the surrounding area. Construction activities associated with DDOT projects and the Metropolitan Branch Trail, combined with those activities associated with construction of potential future WTF, would result in additional temporary disturbance from human presence and construction noise, causing displacement of wildlife in multiple areas of the park to adjacent habitats. The removal of vegetation to accommodate WTF, trails, and road improvements would also result in an increase of permanent loss of habitat in multiple areas of the park, resulting in permanent displacement of wildlife. As Rock Creek Park represents a large area of unbroken habitat in the city, the cumulative impacts of any habitat fragmentation become greater in that context. Operation and maintenance of WTF, trails, and roads would impact wildlife sensitive to noise and human presence, causing displacement of these species from habitat in the vicinity of these areas.

Long-term beneficial effects would be expected from implementation of non-native plant management and white-tailed deer management plans, because habitat improvements would result from a reduction or elimination of non-native plants and control of the white-tailed deer population within the park. The

extent of these beneficial impacts is unknown and they would not likely be great enough to replace lost habitat as a result of construction of WTF, roads improvements, and trails in the park.

The impacts on the park's flora and fauna resources resulting from these past, present and future actions, in combination with the long-term minor adverse impacts for alternative A, would continue to result in long-term moderate adverse cumulative impacts. Impacts would depend on the location of WTF relative to road improvements and trails and the ability to allow sufficient contiguous habitat for displaced wildlife to continue life functions.

Conclusion. Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term minor adverse impacts to flora or fauna are expected for alternative A as a result of habitat disturbance and loss during the construction, operation, and maintenance of potential future WTF throughout the park. Long-term negligible adverse impacts would be expected for co-located facilities on existing sites. Long-term moderate adverse cumulative effects would be expected for alternative A. Impairment to flora and fauna would not occur.

Impacts of Alternative B: Zone Management

Analysis. As with alternative A, long-term beneficial impacts to flora and fauna would be expected from not granting applications for WTF, under any circumstances, in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park as part of alternative B.

Short- and long-term minor adverse impacts, similar to those described in alternative A, from construction, operation, and maintenance of WTF would occur. These impacts would be related to the noise and disturbance from construction and operation that would result in direct habitat loss, or habitat avoidance by sensitive species. However, impacts would be less than those described in alternative A because the associated permit terms and conditions that would be applied in the different zones and park units would result in a lesser development footprint in some places. For example, in alternative B, there are limitations on the size of WTF in the Valley Floor Automobile Access Zone and limitations regarding development of facilities in the existing development footprint in the Administration/Operations Zone. Locating WTF in existing footprints would also reduce or eliminate habitat loss. The establishment of zones to assist in the evaluation of applications for WTF would provide the park with a process with that allows for additional benefits to the parks flora and fauna by more specifically stating the types of WTF that would be acceptable in the various zones.

Although the types of impacts to flora and fauna from potential future WTF would be similar to those described in alternative A, establishing zones with permit terms and conditions that require specific technology or types of WTF would help to reduce the amount of habitat loss and disturbance from potential future WTF. In addition, potential permit conditions that call for the use of concealed facilities and the best available technology would further reduce impacts to flora and fauna by locating noise and disturbance from human presence in already disturbed areas.

Cumulative Impacts. Cumulative impacts for alternative B would be the same as those described in alternative A. However, the level of impact for alternative B would be expected to be less than described in alternative A, resulting in long-term minor adverse cumulative impacts. Prohibiting facilities under any circumstances in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park and limiting facility locations in designated zones or park units with associated permit terms and conditions would allow for sufficient alternative habitats for displaced wildlife as a result of construction activities associated with DDOT projects, the Metropolitan Branch Trail, and WTF. In addition, overall

habitat loss would be reduced by potentially requiring WTF to locate within existing footprints of development.

The impacts on the park's flora and fauna resources resulting from these past, present, and future actions, in combination with the long-term minor adverse impacts for alternative B, would continue to result in long-term minor adverse cumulative impacts.

Conclusion. Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term minor adverse impacts are expected from ground and noise disturbance during construction, operation, and maintenance of WTF; however, impacts are expected to be less than those described in alternative A, as zone/area specific permit terms and conditions would require certain types of technologies that would promote less disturbance of habitat. Long-term minor adverse cumulative impacts would occur for alternative B. Impairment to flora and fauna would not occur

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. Long-term beneficial impacts to flora and fauna would be expected from not granting permits for WTF under any circumstances in the Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park, as described in alternative A.

Long-term negligible impacts would be expected for alternative C from construction, operation, and maintenance of WTF, because facilities would be encouraged to locate in areas of the park that are needed to address coverage gaps, mainly along Beach Drive in Reservation 339 and the tributaries along the road. Within the areas where siting would be encouraged, specific permit terms and conditions would be applied to address the physical aspects of new WTF (height, width, appearance), as well as the types of disturbance that would not be allowed along the edges of the Forest Zone. In areas outside of Beach Drive and the tennis center, siting would not be encouraged, but any applications for those areas would be evaluated under the zone/area structure described in alternative B.

Short- and long-term construction, operation, and maintenance impacts would be the same as those in alternative B but would be considered negligible because the disturbance would be much more limited in those areas where the park would encourage siting. These areas in the park are busy urban roadways, or consist of urban landscapes (maintained lawns), and therefore are highly disturbed areas and do not provide habitat for the majority of species at the park. Species in the Forest Zone, which adjoins to these roadway areas, would still experience a low level of disturbance from noise associated with construction, operation, and maintenance, but this level of disturbance would be more indirect and would be long-term, negligible, and adverse. Further, as no trees over 4 dbh would be permitted to be removed, impacts to vegetation would also be limited.

In alternative C, permits for WTF would not be strictly limited to disturbed areas where the coverage gaps occur, as applications would be accepted and evaluated for all units of Rock Creek Park. Based on studies that show Beach Drive as the area with coverage gaps, it is assumed that this is the area where providers would most likely to want to site. The anticipated demand for siting is in areas with coverage gaps and because siting would be encouraged in areas with coverage gaps, would likely result in long-term, negligible, adverse impacts to flora and fauna in all units of Rock Creek Park.

Cumulative Impacts. Cumulative impacts for alternative C would be the same as those described in alternative A. However, the level of impact for alternative C would be less than described in alternative A, resulting in long-term negligible cumulative impacts. Construction of WTF would likely occur in

highly disturbed areas adjacent to urban roadways, similar to or the same as those proposed under DDOT projects and the Rehabilitation of Rock Creek and Potomac Parkways. This would result in the potential for less habitat loss than alternatives A or B and allow for sufficient alternative habitats for wildlife displaced by noise and disturbance from human presence. There would also likely be less habitat loss associated with construction, maintenance, and operation of trails, roads, and WTF.

The impacts on the park's flora and fauna resources resulting from these past, present, and future actions, in combination with the long-term minor adverse impacts for the alternative C, would continue to result in long-term negligible adverse cumulative impacts.

Conclusion. Long-term beneficial impacts to flora and fauna are expected from not granting right-of-way permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park. Short- and long-term negligible adverse impacts are expected from construction, operation, and maintenance of WTF as siting would be encouraged in areas of the park with coverage gaps, and specific terms and conditions would be applied to applications in these areas. For siting requests in areas that do not have coverage gaps, these applications would be evaluated by zone as described in alternative B, with long-term, minor, adverse impacts for facilities sited in these areas. Long-term negligible adverse cumulative impacts would occur for alternative C. Impairment to flora and fauna would not occur.

Sensitive Species

Guiding Regulations and Policies

The NPS *Management Policies 2006* state that potential effects of agency actions would also be considered on state or locally listed species (NPS 2006). The NPS is required to control access to important habitat for such species and to perpetuate the natural distribution and abundance of these species and the ecosystems upon which they depend.

The need to protect sensitive species in the park is further guided by the purpose of the park “to provide for recreation that is compatible with the park and to protect its natural and cultural resources.” In addition, the park's enabling legislation calls for retaining timber, animals and curiosities in as natural condition as possible, which would include sensitive species. In the park's GMP, management goals call for federal- and District-listed threatened or endangered species and their habitats to be protected and sustained, which would include any species of special concern within Rock Creek Park.

Methodology and Assumptions

The following describes the methodology used to evaluate the impacts of the proposed alternatives on sensitive species and associated habitat at Rock Creek Park. This section discusses the potential for impacts to sensitive species based on the potential for the species to occur, or record that it does occur, in habitats at and in the vicinity of any existing or proposed WTF. The analysis incorporates the best available research related to the construction, operation, and maintenance of WTF and the effects on sensitive species. The following also assumes that all future applications for new WTF or co-location on existing WTF would be required to comply with the ESA and NHPA.

It is assumed that due to the urban setting of the park, the majority of sensitive species habitat has received some amount of disturbance associated with human activities. It is also assumed that “an area of sensitive habitat” is defined as all areas containing sensitive species habitat.

Study Area

The study area for assessment of alternatives includes all 99 administered units of Rock Creek Park; however the focus of the analysis is on the largest unit of Rock Creek Park (Reservation 339) and the Rock Creek and Potomac Parkway.

Impact Thresholds

- Negligible:** There would be no observable or measurable impacts to sensitive species or species of special concern, their habitats, or the natural processes sustaining them. Impacts would be well within natural fluctuations.
- Minor:** Impacts on sensitive species or species of special concern, their habitats, or the natural processes sustaining them would be detectable, but would not be outside the natural range of variability. Occasional responses to disturbance by some individuals could be expected, but without interference to feeding, reproduction, resting, or other factors affecting population levels. Small changes to local population numbers, population structure, and other demographic factors might occur. However, some impacts might occur during critical reproduction periods or migration for a species, but would not result in injury or mortality. Sufficient habitat in the park would remain functional to maintain the viability of the species in the park.
- Moderate:** Impacts on sensitive species or species of special concern, their habitats, or the natural processes sustaining them would be detectable and could be outside the natural range of variability. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, resting, migrating or other factors affecting local population levels. Some impacts might occur in key habitats in the park. However, sufficient population numbers or habitat in the park would remain functional to maintain the viability of the species in the park.
- Major:** Impacts on sensitive species or species of special concern, their habitats, or the natural processes sustaining them would be detectable, would be expected to be outside the natural range of variability, and would be permanent. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a decrease in park population levels. Impacts would occur during critical periods of reproduction or in key habitats in the park and result in direct mortality or loss of habitat that might affect the viability of a sensitive species. Local population numbers, population structure, and other demographic factors might experience large declines.
- Impairment:** The action would contribute substantially to the deterioration of sensitive species or species of special concern in Rock Creek park units to the extent they would no longer function as a part of the natural system. In addition, some of these adverse major impacts on the park's resources and values would:
- contribute to deterioration of sensitive species or species of special concern and values to the extent that the purpose of Rock Creek Park units would not be fulfilled as established in its enabling legislation;
 - affect resources key to the natural or cultural integrity or opportunities for enjoyment in the Rock Creek Park units; or

- affect the resource whose conservation is identified as a goal in the GMP (NPS 2005a) or other planning documents for the park.

Duration:

Short-term effects would be one to two breeding seasons for sensitive species or species of special concern.

Long-term effects would be anything beyond two breeding seasons.

Impacts of Alternative A: No-Action Alternative

Analysis. In alternative A, applications for WTF would be evaluated by NPS within any unit of the park, subject to the process provided in RM-53. Facilities at proposed new WTF sites would include antenna support structures, access roads or driveways, trenching infrastructure (buried electric lines and fiber optic cable), and equipment cabinets. No fencing would be permitted around facilities or their associated structures.

Long-term beneficial impacts to sensitive species would be expected because applications for WTF would not be granted in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and areas of sensitive habitat. The majority of habitat for sensitive species in Rock Creek Park units is found in the main unit (Reservation 339), within the Forest Zone and the Park Road Zone. Because applications for WTF would not be granted in these zones, sensitive species habitat would remain intact throughout Rock Creek Park, which would maintain or improve current sensitive species population numbers and viability and retain the regional island of preserved forested habitat that the park provides.

Long-term negligible adverse impacts to sensitive species would be expected as a result of facility construction, operation, and maintenance including ground disturbance, noise disturbance, and human presence. Noise disturbance would be generated from the cooling fans in the WTF equipment buildings and from maintenance activities associated with WTF (pruning, mowing, etc.) that could degrade adjacent sensitive species habitat and result in displacement of sensitive species. In compliance with RM-53, each proposed facility application would require an associated NEPA document which would address the presence of sensitive species on a site-specific basis and would be used as a tool to identify any potential impacts to sensitive species. As identified in the NEPA document, if sensitive species are present, NPS guiding regulations and policies call for the control of access to important habitat for such species and that species and their habitats are protected and sustained. Therefore, facilities would not likely be located in sensitive species habitat and any long-term, adverse impacts would be negligible. Long-term negligible adverse impacts would occur from facilities co-located with existing WTF facilities because these areas do not contain habitat for designated sensitive species.

Short- and long-term minor adverse impacts to sensitive species could occur due to the potential spread of non-native or invasive species. Construction of WTF in any edge areas in the vicinity of sensitive species habitat could result in the creation of new edge habitats, which could create new habitat for non-native plant species and result in competition with native species. If non-native species are not controlled or extirpated, this could eventually lead to sensitive species habitat degradation.

Cumulative Impacts. Long-term negligible adverse cumulative effects to sensitive species would be expected as a result of past, present, and reasonably foreseeable actions occurring with Rock Creek Park units and surrounding areas. The area of DDOT Projects and the Metropolitan Branch Trail would be

limited, and it is unlikely WTF would be located in sensitive species habitat, which would result in negligible adverse impacts. Operation and maintenance of WTF, trails, and roads would indirectly impact sensitive species affected by noise and human presence, resulting in potential habitat degradation and displacement of sensitive species from habitat in the vicinity of these areas. Indirect impacts would occur in a limited area and have negligible adverse impacts.

Long-term beneficial effects would be expected from implementation of non-native plant management and white-tailed deer management plans due to habitat improvements that would result from a reduction or elimination of non-native plants and control of the white-tailed deer population within the park.

The impacts on the park's sensitive species resulting from these past, present and future actions, in combination with the long-term negligible to minor adverse impacts for the no-action alternative, would continue to result in long-term negligible adverse cumulative impacts.

Conclusion. Long-term beneficial impacts to sensitive species would be expected from not granting permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas. Short- and long-term negligible to minor adverse impacts to sensitive species would be expected as a result of implementing alternative A. However, it is likely that only negligible impacts would occur because all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to WTF, which would limit any direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse impacts would be expected for co-located facilities on existing WTF, as no sensitive species habitat is present around these WTF. Long-term negligible adverse cumulative effects would occur for alternative A. Impairment to sensitive species would not occur.

Impacts of Alternative B: Zone Management

Analysis. Long-term beneficial impacts to sensitive species would be expected from not granting applications for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and areas of sensitive habitat, as described in alternative A.

Short- and long-term negligible adverse impacts to sensitive species would be expected as a result of facility construction, operation, and maintenance in areas where applications could be granted, as described in alternative A. In compliance with RM-53, each proposed facility application would require an associated NEPA document that would indicate site-specific species surveys and impacts. If sensitive species are present, NPS guiding regulations and policies call for the control of access to important habitat for such species and that species and their habitats are protected and sustained. Therefore, facilities would not likely be located in sensitive species habitat and long-term, adverse impacts would be negligible. As with alternative A, the potential for long-term, minor adverse impacts does exist from any construction occurring in edge habitats that would promote the spread of non-native and invasive species, which could impact nearby sensitive species habitat.

Long-term negligible adverse impacts would occur from facilities co-located with existing WTF because these areas do not contain sensitive species habitat. Any impacts to sensitive species that would occur for alternative B would not be measurable or detectable, as areas of habitat appropriate for sensitive species would not be considered, and any fluctuation in these populations would be well within natural fluctuations.

Cumulative Impacts. Actions that would have cumulative impacts with the proposed action for alternative B would be the same as those described in alternative A. However, the level of impact for alternative B would be less than described in alternative A, resulting in long-term negligible adverse

cumulative impacts. Prohibiting facilities under any circumstances in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park and limiting facility locations in designated zones or park units with associated permit terms and conditions would further reduce the areas of disturbance.

The impacts on the park's sensitive species resulting from these past, present, and future actions, in combination with the long-term negligible and adverse and long-term beneficial impacts for alternative B, would continue to result in long-term negligible adverse cumulative impacts.

Conclusion. Long-term beneficial impacts to sensitive species would be expected from not granting permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas. Short- and long-term negligible to minor adverse impacts to sensitive species would be expected as a result of implementing alternative B. However, it is likely that only negligible impacts would occur because all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to WTF, which would limit any direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse impacts would be expected for co-located facilities on existing WTF, as no sensitive species habitat is present around these WTF. Long-term negligible adverse cumulative effects would occur for alternative B. Impairment to sensitive species would not occur.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. Long-term beneficial impacts to sensitive species would be expected from not granting permit applications for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and areas of sensitive habitat, as described in alternative A.

Further, applicants would be encouraged to site in areas where there are existing gaps in cellular coverage, mainly along Beach Drive. In areas along Beach Drive where facilities would be encouraged with specific permit terms and conditions, long-term negligible adverse impacts to sensitive species would be expected as a result of facility construction, operation, and maintenance. In other areas of the park where there are not coverage gaps, facilities would be evaluated under the framework presented in alternative B, resulting in long-term negligible adverse impacts.

As described in alternatives A and B, in compliance with RM-53, each proposed facility application would require an associated NEPA document that would indicate site-specific species surveys and impacts. If sensitive species are present, NPS guiding regulations and policies call for the control of access to important habitat for such species and that species and their habitats are protected and sustained. Therefore, facilities would not likely be located in sensitive species habitat and adverse impacts would be long-term negligible adverse.

As this alternative would encourage applications for WTF in areas along Beach Drive or to the already developed tennis center, the indirect noise and disturbance impacts to sensitive species related to construction, operation, and maintenance of WTF in the park would likely be long-term, negligible, and adverse. Any impacts to sensitive species that would occur in alternative C would not be measurable or detectable, as areas of habitat appropriate for sensitive species would not be considered, and any fluctuation in these populations would be well within natural fluctuations. Similar to alternative A, the potential for long-term, minor, adverse impacts would occur if WTF construction in an edge habitat area resulted in the spread of non-native or invasive species into adjacent areas with sensitive species habitat. As with alternative A, any co-location on existing facilities would be expected to have long-term negligible adverse impacts.

Cumulative Impacts. Cumulative impacts for alternative C would be the same as those described in alternative B, resulting in long-term negligible adverse cumulative impacts. Encouraging the siting of WTF in areas with known coverage gaps, mainly along Beach Drive, along with associated permit terms and conditions in that area, would provide the least amount of area for disturbance as a result of construction activities associated with DDOT projects, the Metropolitan Branch Trail, and WTF. In addition, overall habitat loss would be reduced by potentially requiring WTF to locate within existing footprints of development. Although siting would be encouraged in areas with known coverage gaps, applications for other areas of the park would be evaluated using the alternative B zone framework.

The impacts on the park's sensitive species resulting from these past, present and future actions, in combination with the long-term negligible adverse and long-term beneficial impacts for alternative C, would continue to result in long-term negligible adverse cumulative impacts.

Conclusion. Long-term beneficial impacts to sensitive species would be expected from not granting permit applications for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park, and sensitive habitat areas and from encouraging future sitings in areas with known coverage gaps. Long-term negligible adverse impacts would occur from encouraging siting in along Beach Drive and the associated permit terms and conditions for WTF. Further, all WTF applications would be evaluated for compliance with NPS guiding regulations and policies, and all applicable authorities related to WTF, which would limit any direct or indirect disturbance to sensitive species during construction, operation, and maintenance of WTF. Long-term negligible adverse cumulative impacts would occur for alternative C. Impairment to sensitive species would not occur.

Avian Species

Guiding Regulations and Policies

The act establishes that all migratory birds and their parts (including eggs, nests, and feathers) are fully protected. The act establishes a prohibition, unless permitted by regulations, to

“pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird...or any part, nest, or egg of any such bird.”

The act also provides the Secretary of the Interior with authority to determine when “hunting, taking, capture, killing, possession, sale, purchase, shipment, transportation, carriage, or export of any...bird, or any part, nest or egg” could be undertaken and to adopt regulations for this purpose (USFWS 1992).

Executive Order #13186, Responsibility of Federal Agencies to Protect Migratory Birds, requires each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a Memorandum of Understanding with the USFWS to promote the conservation of migratory bird populations.

USFWS for Recommendation on Communications Tower Siting, Construction, Operation, and Decommissioning were developed recognizing that staff may need to be involved in review of proposed facilities and/or in the evaluation of their impacts on migratory birds. These recommendations and guidance are to be used until the Communication Tower Working Group, a group of government agencies, industry, academic researchers and non-governmental organizations, develops significant new

mitigation measures to prevent bird strikes related to WTF. They are provided in accordance with the *Fish and Wildlife Coordination Act*, as amended, the *Migratory Bird Treaty Act*, and Section 7 of the *Endangered Species Act*, as amended. This guidance is further described in chapter 1.

NPS *Management Policies 2006*, Section 4.4 Biological Resource Management, requires that the NPS "...maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems. The term 'plants and animals' refers to all five of the commonly recognized kingdoms of living things and includes such groups as flowering plants, ferns, mosses, lichens, algae, fungi, bacteria, mammals, birds..."

The ongoing study at Rock Creek Park examining the potential for bird strikes with the two exiting WTF in the park, which was required by the FONSI for the 2003 *Rock Creek Park Telecommunication Facilities EA*, was also considered in the evaluation of all alternatives for this plan/EA. This three year study, entitled *The Effect of Cell Towers on Birds and Bats at Rock Creek Park, Washington, D.C.*, is in its second year of data collection. The results of this study would be considered as the park evaluates future applications for WTF and these results could determine if right-of-way permits for WTF in the park would be granted in the future in certain areas. This study will also be considered by the NCPC in their review of these applications.

Methodology and Assumptions

Potential impacts to birds from WTF in Rock Creek Park were evaluated using the best available research related to the construction, operation, and maintenance of WTF and the effects on resident and migratory birds and their habitats.

The primary biological resource concern associated with the alternatives is the potential impact to Rock Creek Park bird populations and habitats. In preparation of this analysis, relevant scientific data were reviewed, including data related to the sensitivity of breeding and migratory birds to disturbance from WTF. Past monitoring and data collection in Rock Creek Park and Washington, D.C. were also reviewed.

Study Area

The study area for assessment of alternatives includes all 99 administered units of Rock Creek Park; however the focus of the analysis is on the largest unit of Rock Creek Park (Reservation 339) and the Rock Creek and Potomac Parkway.

Impact Thresholds

The following thresholds were used to determine the magnitude of effects on avian species:

- Negligible:** There would be no observable or measurable impacts to avian species, their habitats, or the natural processes sustaining them.
- Minor:** Impacts would be detectable. Few occurrences of mortality of any avian species (resident or migratory) at the site of WTF would be documented. Sufficient habitat would remain functional to maintain the viability of all resident and migratory species utilizing the habitat in the vicinity of and at the sites of any existing or possible future WTF.
- Moderate:** Avian mortality at the site of WTF is measured in more frequent incidences. Mortality of species' individuals may also be higher. Habitat remains sufficient and functional in the vicinity of and at the site of existing or possible future WTF.

Major: Avian mortality at the site of WTF is consistently observable and documented in large numbers of individuals and/or species impacted.

Impairment: The severity of avian impacts reaches a level where habitat loss, population declines in resident species, and migrant species are severely affected. Impacts would have a major adverse effect on park resources and values; contribute to deterioration of avian species to the extent the park's purpose could not be fulfilled as established in its enabling legislation; or affect resources key to the park's natural or cultural integrity or opportunities for enjoyment.

Duration:

Short-term effects would be 1 year for avian species.

Long-term effects would be anything beyond 2 years.

Impacts of Alternative A: No-Action Alternative

Analysis. In the no-action alternative, applications for WTF would be evaluated by NPS within any unit of Rock Creek Park, subject to the application process under RM-53. Evaluation of these applications would continue to be subject to all applicable guidance, including the USFWS guidance for WTF siting (see chapter 1). Although applications for WTF would be evaluated throughout the park, right-of-way permits for WTF would not be granted in certain areas such as the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park as well as wetland and other habitats, because of the sensitive natural and cultural resources that occur in these areas, including resident and migratory birds that are known to concentrate in these zones.

Under the no-action alternative there is no imposed limit on the number of WTF that could be constructed in the park; however, the proliferation of WTF would not be permitted to the point where there would potential impacts to avian species to a large degree. The determination of this level of impact would be made through the individual NEPA documentation required for all right-of-way permit applications. Based on this assumption, WTF construction would result in long-term minor adverse impacts to birds if the number of new WTF is kept low, to long-term moderate adverse impacts if the number of new WTF is high. In the no-action alternative, long-term beneficial impacts would occur from not granting permits for WTF in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park because much of the higher quality habitat for resident and migratory birds in Rock Creek Park units are located within the Forest and Park Road Zones. As such, restricting construction of WTF in this high quality habitat for avian species would reduce park-wide impacts including collisions with WTF or avoidance of otherwise high-quality habitat by avian species. Limitations on fencing around WTF and associated structures would also be long-term and beneficial to birds because habitats without fencing are less fragmented and therefore more available for use by birds.

Communication towers, such as WTF, are known to be a risk factor to birds (Manville 2000); therefore, each new WTF sited in the park would pose an additional risk to birds. In alternative A, co-location of any new WTF on the two existing monopole structures would be beneficial to birds because co-location translates into elimination of the risk associated with new WTF. Construction of new WTF would result in short-term minor adverse impacts to birds and the habitats that birds rely upon. These impacts would result from disturbance to the ground at construction sites and from removal of vegetation in these habitats during construction of WTF and associated structures. Construction would also create noise

disturbance and expose potential avian habitat to an increase in human presence. The lack of a clear height restriction for new WTF, outside the USFWS guidelines, which allow for WTF up to 199 feet, in alternative A would result in long-term moderate adverse impacts to birds because taller towers pose a greater risk of collision than shorter towers. Conversely, the exclusion of guy wires on WTF in accordance with all applicable authorities, including the USFWS Guidelines, would be long-term and beneficial to birds, as guy wires are a known avian collision risk factor at towers that host them. The exclusion of guy wires is beneficial because it reduces potential impacts from collisions between birds and WTF.

Overall, construction would result in temporary degradation of habitat for some bird species. Once construction is over, and depending upon the degree to which impacted habitats return to their pre-construction state, birds may return and resume use of these sites. The fact that construction of new WTF would be excluded from wetlands and other habitats and locations where birds are known to concentrate would reduce the potential impacts to avian species from WTF.

Specific impacts to resident and migratory birds for the no-action alternative are currently being studied by Rock Creek Park. The park is in the second year of a three year study that is one of the first to look at the impact of unlit, unguyed “short towers” and their potential impacts on avian species. This study was part of the same FONSI for the 2003 *Rock Creek Park Telecommunication Facilities EA* for the existing WTF in the park that led to the development of this plan/EA. As part of this study, the park is conducting a spring, summer and fall assessment, each year for three years using both ground and net sampling to look for evidence of bird strikes at the existing facilities. The results of the first year of this study, shown in appendix C, found three dead birds, one partial carcass, and five feather piles between the two existing facilities. These results were all from ground surveys and included 151 daily searches and 432.5 search hours. No individuals were collected in the net tests. Initial findings showed the majority of fatalities during the summer, which is the opposite of other research showing them to occur in the fall. Further, the study found no neotropical migrant fatalities, despite their presence in the area. While the preliminary data from this study suggest that the short monopole WTF construction is not obstructive to migratory birds in the current WTF locations, there are still two years of data collection remaining in the study (University of Maryland Center for Environmental Sciences 2007). Based on initial findings, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, these findings are only preliminary and do not represent the final study findings. At the end of the study, the actual conclusions, whatever they may be, would be considered by the park during the review of all right-of-way permit applications for WTF.

Cumulative Impacts. Past, present, and reasonably foreseeable actions occurring within the park and the surrounding area that would be expected to contribute to cumulative impacts include construction activities associated with DDOT projects and the Metropolitan Branch Trail, combined with those activities associated with construction of potential future WTF. These projects would cause temporary displacement of birds from human presence and construction noise in multiple areas of the park. The removal of vegetation to accommodate WTF, trails, and road improvements would also result in an increase of permanent loss of avian habitats in multiple areas of the park, resulting in permanent displacement of some birds. As Rock Creek Park represents one of the oldest and largest protected areas of natural vegetation in the region (NPS 2005a), the cumulative impacts of any habitat fragmentation become greater in that context. Operation and maintenance of WTF, trails, and roads not associated with WTF would impact birds sensitive to noise and human presence, causing displacement of these species from habitat in the vicinity of these areas. Because of these impacts, the above projects would be expected to have long-term moderate adverse impacts to avian species in areas surrounding the park.

The impacts to avian species resulting from these past, present and future actions, in combination with the long-term minor to moderate adverse and long-term beneficial impacts for the no-action alternative, would result in long-term minor to moderate adverse impacts to avian species found in the park.

Conclusion. In the no-action alternative there would be long-term beneficial impacts from not granting permits for WTF in the main areas of avian habitat, prohibitions on fencing, and the potential for co-location on existing WTF, which all reduce the potential for habitat fragmentation. Long-term minor to moderate adverse impacts to avian species could occur from habitat loss and increased collision risk, depending on the number of WTF sited in the park. A lack of a clear height restriction, outside the USFWS guidelines, for future WTF for alternative A would result in long-term moderate adverse impacts. During construction of new WTF, short-term minor adverse impacts would be expected to occur from the temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, minor to moderate, and adverse. In the no-action alternative, impairment to avian species would not occur.

Impacts of Alternative B: Zone Management

Analysis. In alternative B, permits for WTF would not be granted in certain areas such as the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, Montrose Park as well as wetland and other habitats, because of the sensitive natural and cultural resources that occur in these areas, including resident and migratory birds that are known to concentrate in these zones. As described in alternative A, not siting WTF in these areas would result in long-term beneficial impacts to birds. As with the no-action alternative, fencing would not be permitted around WTF facilities or their associated structures in zones where WTF could be sited and this would be long-term and beneficial to birds as habitats surrounding WTF would be more available to birds. Similarly, co-location of any new WTF on the two existing monopole structures would be beneficial to birds because co-location translates into elimination of risk associated with new WTF facilities.

Construction of new WTF in zones where such facilities might be placed would result in short-term minor adverse impacts to birds and vegetation. These areas contain habitats that birds rely on and these habitats could be impacted from ground disturbance at construction sites and from removal of vegetation during construction of WTF and associated structures. As with alternative A, construction of WTF, where permit applications would be approved, would create noise disturbance and expose bird habitats to an increase in human presence. In addition to these adverse impacts, long-term beneficial impacts would occur from the exclusion of guy wires, per USFWS guidance of tower siting. Overall, construction activities would result in temporary degradation of habitat for some bird species. Upon cessation of construction, depending on the degree to which impacted habitats return to their pre-construction state, birds may return and resume use of these sites. After construction, noise associated with normal operations, such as generators, cooling systems, etc., would result in long-term minor to moderate adverse impacts in a limited radius around the facilities, depending on how the sound attenuates through forested areas.

As described in alternative A, specific impacts to resident and migratory birds are currently being studied by Rock Creek Park. The park is in the second year of a three year study that is one of the first to look at the impact of unlit, unguyed “short towers” and their potential impacts on avian species. This study was part of the same FONSI for the 2003 *Rock Creek Park Telecommunication Facilities EA* for the existing WTF in the park that led to the development of this plan/EA. As part of this study, the park is conducting a spring, summer and fall assessment, each year for three years using both ground and net sampling to look for evidence of bird strikes at the existing facilities. The results of the first year of this study, shown in appendix C, found three dead birds, one partial carcass, and five feather piles between the two existing

facilities. These results were all from ground surveys and included 151 daily searches and 432.5 search hours. No individuals were collected in the net tests. Initial findings showed the majority of fatalities during the summer, which is the opposite of other research showing them to occur in the fall. Further, the study found no neotropical migrant fatalities, despite their presence in the area. While the preliminary data from this study suggest that the short monopole tower construction is not obstructive to migratory birds in the current tower locations, there are still two years of data collection remaining in the study (University of Maryland Center for Environmental Sciences 2007). Based on initial findings, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, these findings are only preliminary and do not represent the final study findings. At the end of the study, the actual conclusions, whatever they may be, would be considered by the park during the review of all right-of-way permit applications for WTF.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that would be expected to contribute to impacts on avian species for alternative B would be the same as those described in alternative A, and result in long-term moderate adverse impacts.

The impacts to avian species resulting from these past, present and future actions, in combination with the long-term minor adverse, and long-term beneficial impacts for alternative B, would result in long-term minor adverse impacts to avian species found in the park.

Conclusion. In alternative B there would be long-term beneficial impacts from not granting permits for WTF in main areas of avian habitat, prohibitions on fencing, additional design requirements that could result in shorter facilities, and the potential for co-location on existing facilities as these actions reduce the potential for habitat fragmentation. Long-term negligible to minor adverse impacts would occur in those areas of the park where WTF would be sited due to the potential for habitat loss and bird collisions with WTF facilities. During construction of new WTF, short-term minor adverse impacts would be expected to occur from the temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, minor to moderate, and adverse. In alternative B, impairment to avian species would not occur.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, applicants wishing to site WTF in the park would be encouraged to submit applications for areas where their placement would address existing coverage gaps, which would be mainly along Beach Drive (Cityscapes Consulting 2007). WTF applications for other areas in the park would be evaluated using the zone guidelines provided in alternative B. This alternative, like alternative A, would exclude large areas of suitable bird habitat in the park from siting of WTF and would have long-term beneficial impacts to birds, as described in alternative B. Short-term negligible adverse impacts would be expected for alternative C from construction, operation, and maintenance of WTF because the facilities would be encouraged to locate in areas of the park that appear to contain coverage gaps, based on the analysis conducted for this plan/EA (Cityscapes Consulting 2007). These areas are already highly developed urban roadways and landscapes and as such, any adverse impact from construction, operation, and maintenance of WTF would be short-term and negligible. Birds in the Forest Zone adjacent to these roadway areas would experience low-level disturbance from noise associated with construction, operation, and maintenance. In alternative C, should the majority of providers submit applications to locate in areas where there are coverage gaps, the disturbance from this noise would be expected to occur closer to the roadway and more developed areas. When compared to alternatives A and B, where noise

disturbance could occur closer to more valuable habitat, the impacts and level of disturbance would be more indirect, long-term, negligible, and adverse for alternative C. As described in alternative A, the exclusion of guy wires and fencing would have long-term beneficial impacts to birds. Once construction is over, depending upon the degree to which impacted habitats return to pre-construction state, species may return and resume use of this habitat.

As described in alternative A, specific impacts to resident and migratory birds are currently being studied by Rock Creek Park. The park is in the second year of a three year study that is one of the first to look at the impact of unlit, unguyed “short towers” and their potential impacts on avian species. This study was part of the same FONSI for the 2003 *Rock Creek Park Telecommunication Facilities EA* for the existing WTF in the park that led to the development of this plan/EA. As part of this study, the park is conducting a spring, summer and fall assessment, each year for three years using both ground and net sampling to look for evidence of bird strikes at the existing facilities. The results of the first year of this study, shown in appendix C, found three dead birds, one partial carcass, and five feather piles between the two existing facilities. These results were all from ground surveys and included 151 daily searches and 432.5 search hours. No individuals were collected in the net tests. Initial findings showed the majority of fatalities during the summer, which is the opposite of other research showing them to occur in the fall. Further, the study found no neotropical migrant fatalities, despite their presence in the area. While the preliminary data from this study suggest that the short monopole tower construction is not obstructive to migratory birds in the current tower locations, there are still two years of data collection remaining in the study (University of Maryland Center for Environmental Sciences 2007). Based on initial findings, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, these findings are only preliminary and do not represent the final study findings. At the end of the study, the actual conclusions, whatever they may be, would be considered by the park during the review of all right-of-way permit applications for WTF.

Cumulative Impacts. Past, present, and reasonably foreseeable future actions that would be expected to contribute to impacts on avian species in alternative C would be the same as those described in alternative A, and result in long-term moderate adverse impacts.

The impacts to avian species resulting from these past, present and future actions, in combination with the long-term negligible adverse, and long-term beneficial impacts for alternative C, would result in long-term negligible adverse impacts to avian species found in the park.

Conclusion. In alternative C there would be long-term beneficial impacts from not granting permits for WTF in main areas of avian habitat, encouraging siting in a specific area of the park where coverage gaps exist, prohibitions on fencing, specific design requirements that would result in shorter facilities, restriction on disturbance in the Forest Zone, and the potential for co-location on existing facilities as these actions reduce the potential for habitat fragmentation. Long-term negligible adverse impacts would occur in those areas of the park where WTF would be sited due to the potential for habitat loss and bird collisions with WTF facilities in these areas that are not considered the main areas of habitat for avian species. During construction of new WTF, short-term negligible to minor adverse impacts would be expected to occur from temporary habitat loss and disturbance. Based on the initial findings of the bird study currently occurring at the park, the potential impact of bird collisions with WTF is long-term, minor, and adverse. However, this study is ongoing and the final conclusions, when available, would be used in the evaluation of future right-of-way permits for WTF in the park. Cumulative impacts would be long-term, negligible to moderate, and adverse. In alternative C, impairment or impacts to avian species would not occur.

AIR QUALITY

The construction, operation, and maintenance of WTF involves the potential emission of various compounds that pollute the air. These air pollutants may impact park visitor and employee health, sensitive park resources, and the surrounding community. For example, in the presence of sunlight, Volatile Organic Compounds (VOC) and Nitrous oxide (NO_x) emissions form ozone, which can cause or contribute to respiratory illness. Ozone is a pollutant of particular concern in Rock Creek Park as the Metropolitan Washington Air Quality Region, the location of the study area, is designated as a moderate ozone non-attainment area. Construction equipment and generators related to the placement and operation of WTF also produce emissions such as particulate matter (2.5 microns) and carbon monoxide (CO), which are also pollutants of concern within the District of Columbia region. The District of Columbia is in non-attainment for PM_{2.5} and is also a CO maintenance area.

Guiding Policies and Regulations

Clean Air Act Conformity Requirements. The Clean Air Act establishes national ambient air quality standards to protect the public health and welfare from air pollution. NPS units that do not meet the national ambient air quality standards or whose resources are already being adversely affected by current ambient levels require a greater degree of consideration and scrutiny by NPS managers. Areas that do not meet national air quality standards for any pollutant are designated as non-attainment areas.

Federal agencies must ensure that any action taken does not interfere with a state's plan to attain and maintain the national ambient air quality standards in designated non-attainment and maintenance areas. In making decisions regarding WTF operations and maintenance within a designated non-attainment area, park managers must conduct a conformity review to ensure that any pollutants added will not interfere with plans to attain national standards as documented in the *State Implementation Plan*. If there is a possibility that the addition of pollutants could interfere with *State Implementation Plan* compliance, then the park managers should discuss plans with the appropriate state air pollution control agency and conduct a more formal conformity determination.

Washington, D.C. is designated by the EPA as in moderate non-attainment for ozone, non-attainment for PM_{2.5}, and as in attainment for all other criteria pollutants (CO, NO_x, Sulfur dioxide (SO₂), PM₁₀, and lead). The District of Columbia was previously in non-attainment for CO, and therefore is classified as a maintenance area. Ozone is created by NO_x and VOC precursors, while PM_{2.5} includes SO₂ as a precursor. As a result, all five pollutants were analyzed for potential emissions, while only ozone and PM_{2.5} are defined as in non-attainment. The Metropolitan Council of Governments, which is responsible for monitoring air quality in the region, has included control measures related to ozone precursor sources in the *State Implementation Plan*.

Air emissions were also evaluated to determine regional significance. The Plan to Improve Air Quality in the Washington, DC-MD-VA Region: State Implementation Plan (SIP), "Severe Area SIP" Demonstrating Rate of Progress for 2002 and 2005; Revision to 1990 Base Year Emissions; and Severe Area Attainment Demonstration for the Washington DC-MD-VA Non-attainment Area (MWCOG 2004) sets forth daily target levels of 16 tons per day of VOC and 109 tons per day of NO_x for point sources, such as generators, within the Washington Metropolitan ozone non-attainment region. Additionally, daily target levels of 82 tons per day (TPD) NO_x and 68 TPD VOC were set for non-road sources, such as construction equipment, and 234 TPD NO_x and 97 TPD VOC for mobile or on-road sources. Although the 8-hour ozone standard has been approved for use instead of the 1-hour ozone standard, the 8-hour SIP has not yet been finalized. Therefore, pursuant to EPA regulations and in accordance with the Metropolitan Washington Air Quality Committee, the 1-hour SIP remains valid as a basis for comparison of emissions (MWCOG 2005). A draft 8-hour SIP, while not yet approved, has been written and

prescribes emissions budgets for 2008 for point, nonroad, and on-road sources. All daily target levels are presented below in table 22.

TABLE 22: REGIONAL EMISSIONS INVENTORY – STATE IMPLEMENTATION PLAN

Source of Emissions	1-Hour Attainment Year: 2005 (TPY)		8-Hour Rate-of- Progress Year: 2008 (TPY)	
	NOx	VOC	NOx	VOC
Point	109	16	229	14
Non-Road	82	68	77	92
On-Road	234	97	160	71

Source: MWCOG 2007

Additionally, there is no SIP in place for the newly promulgated PM_{2.5} regulations. The DC-MD-VA region has three years to implement a SIP that will create a regional emission inventory for the pollutant PM_{2.5}.

The NPS *Organic Act of 1916* (16 USC § 1 et seq.) and the NPS *Management Policies 2006* guide the protection of park areas. Under its *Management Policies 2006* the NPS will:

“seek to perpetuate the best possible air quality in parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas” (NPS 2006).

General Methodology and Assumptions

An air quality applicability analysis was previously conducted to identify potential increases or decreases in criteria air pollutant emissions associated with the construction, operation, and maintenance of the two existing WTF in Rock Creek Park. An applicability analysis has not been performed for this WTF plan/EA as the exact number of WTF to be sited in the park in the future is not known at this time, but an applicability analysis would be required for each proposed facility as part of the required NEPA process. Since the alternatives would occur within the EPA designated ozone non-attainment area, future construction and operation would be subject to federal conformity requirements as part of the NEPA process. Appendix D contains a detailed description of the methodology and assumptions used to estimate potential emissions for the construction and operation and maintenance of the two existing WTF, which were assumed to be representative of any future facility sited in the park, with the possibility that emissions would be less as technologies have improved since these facilities were completed. The analysis for potential future facilities is a qualitative analysis based on the emissions related to the existing facilities in the park, with the assumption that these emissions may decrease as newer vehicles and generators create fewer emissions.

Study Area

As each alternative potentially includes construction and operation and maintenance activities with the potential to affect local air quality, the study area includes the Metropolitan Washington Air Quality Control Region (including the airshed of the District of Columbia, as well as several counties in Northern Virginia and Southern Maryland), and activities within the park, including potential WTF sites.

Impact Thresholds

Rock Creek Park is in attainment with national ambient air quality standards (NAAQS) for all criteria pollutants except ozone and PM_{2.5}. The following impact thresholds have been defined for the non-attainment pollutants PM_{2.5} and its precursor SO₂, CO and ozone in the form of its precursors VOC and NO_x. These thresholds are based on the *de minimus* levels for criteria pollutants set by the EPA as well as the number of WTF that would need to be constructed to meet or exceed these levels. Emission estimates for potential future WTF are based on the emission levels for construction and operation of the two existing WTF in Rock Creek Park, determined by the Air Quality Applicability Analysis (NPS 2003c), the results of which have been updated based on the new cooling units and emergency generators installed at the two existing WTF sites.

Negligible: There would be no net increase or decrease in emissions from current levels either on a localized or regional level. No construction of WTF.

Minor: Emissions would be greater than 0 tons/year and below 5 tons/year. Emissions would be increased in localized areas where there are currently little to no emissions sources, but would not have a large impact regionally. Five WTF could be built and operated within a one-year timeframe and remain under the minor threshold.

Moderate: Emissions would be greater than 5 tons/year and less than conformity *de minimus* levels (50 tons/year VOC, 100 tons/year NO_x, SO₂, PM_{2.5}, CO). Emissions would increase on both a localized and regional scale. Up to 130 WTF could be built and operated within a one-year timeframe and remain under the moderate threshold.

Major: Emissions would be equal to or greater than conformity *de minimus* levels (50 tons/year VOC, 100 tons/year NO_x, SO₂, PM_{2.5}, CO) on both a localized and regional scale. More than 130 WTF would need to be built and operated within a one-year time frame to exceed the major threshold.

Impairment: Impacts would have a major adverse effect on park resources and values; contribute to deterioration of the park's air quality to the extent the park purpose could not be fulfilled as established in its enabling legislation; affect resources key to the park's natural or cultural integrity or opportunities for enjoyment; or affect the resource whose conservation is identified as a goal in the park's general management plan or other park planning documents.

Duration:

Short-term effects would last during construction of a facility, typically from one to three months.

Long-term effects would be anything beyond the construction of a facility through the life of the facility, including maintenance activities.

Impacts of Alternative A: No-Action Alternative

Analysis. In alternative A, applications for WTF would be evaluated throughout all Rock Creek Park units, but may not be granted in those zones/areas where they would impact natural or cultural resources (see the "Elements Common to All Alternatives" section in chapter 2). For those applications where a

right-of-way permit is granted and a WTF constructed, air emissions would result from the construction, operation, and maintenance of these facilities.

When the WTF currently in the main unit of Rock Creek Park (Reservation 339) were constructed in 2000, emissions from construction equipment and fugitive dust contributed to short-term minor adverse impacts over a course of 90 days. For future WTF approved for siting in Rock Creek Park, similar levels of construction emissions would be expected over a similar timeframe. Emissions from construction would have likely decreased since 2000 as newer equipment with lower emissions would be likely to be used. To estimate construction emissions from the 2000 installation of the existing WTF, only NO_x and VOC emissions data is available as the PM_{2.5} NAAQS had not been promulgated at the time of the previous analysis. As shown in table 23, it is estimated that construction of the two existing WTF created 0.62 tons/year of NO_x and 0.09 ton/year of VOC. These levels fall well below the current *de minimus* standard of 100 tons/year for NO_x and 50 tons/year for VOC for areas in moderate non-attainment of these criteria pollutants.

Using these assumptions, new WTF would create air emissions during operation from periodic testing of emergency generators, as well as emissions from vehicle traffic traveling to and from the site for maintenance. Based on emissions from the current WTF, the emissions from long-term operation and maintenance, when compared to the *de minimus* values for the ozone non-attainment area (50 tons/year for VOC and 100 tons/year each for NO_x, PM_{2.5}, SO₂, and CO), within an ozone transport region, would not be expected to exceed these standards (table 23). Depending on the number of WTF allowed to operate within the park and within a single area, long-term impacts would be minor adverse because some emissions would occur, but would not be expected to exceed 5 tons/year of the criteria pollutants if up to five WTF were installed per year. These minor impacts would be greater, on a localized level, in more remote areas of Rock Creek Park that currently do not have large amounts of emissions locally, but these emissions would not represent a large regional increase in air emissions.

When looking at future WTF and their impact on the regional airshed, emissions from future WTF (table 23) would be well below the goals set forth in the SIPs regional emissions inventory (table 23).

TABLE 23: SUMMARY OF CURRENT ANNUAL EMISSIONS FROM EXISTING TELECOMMUNICATIONS FACILITIES

Activity	Construction Emissions (TPY)		Operation and Maintenance Emissions (TPY)	
	NO _x	VOC	NO _x	VOC
Heavy equipment (tower construction)	0.62	0.09	—	—
Construction crew commuters	0.10	0.17	—	—
Painting	NA	0.02	—	—
Emergency generator	—	—	0.14	0.02
Maintenance traffic	—	—	0.005	0.01
Totals	0.72	0.29	0.15	0.03

TPY = tons per year. Note: Totals differ from the 2003 Telecommunications Facilities EA because since then, the two 30 kilowatt generators at the existing WTF sites have been replaced with two 60 kilowatt diesel generators.

Cumulative Impacts. Cumulative impacts are not determined by *de minimus* thresholds, but are instead based on the SIP described in chapter 3 and under the methodology described above. While *de minimus* levels are used on a per-project basis, SIPs take into consideration all projects and emissions sources (i.e., on-road, off-road, point sources) and create annual emissions budgets for such activities. The current 1-hour and proposed 8-hour SIP emissions budgets are available in table 22 (above).

Construction activities associated with DDOT projects, relocation of the U.S. Park Police Station, and the Metropolitan Branch Trail, combined with those activities associated with construction of additional WTF in Rock Creek Park units, would result in additional temporary emissions from construction equipment and ground disturbance. Operation and maintenance of WTF and trails and roads not associated with WTF would impact air quality with long-term minor adverse effects as well through increased vehicle operation, generator usage, cooling fans, and heating emissions from the proposed police station. Vehicle use on the roadways through the park would continue to contribute to air pollution in the region.

Overall, long-term minor cumulative adverse effects to air quality would be expected depending on the location of WTF relative to road improvements and trails and whether the construction would occur concurrently. Long-term beneficial effects may be seen through roadway improvements, as less idling of congested traffic on local roads may be necessary, therefore producing fewer emissions.

The impacts to air quality within the park and surrounding areas within Air Quality Control Region 47 resulting from past, present, and reasonably foreseeable actions, in combination with the long-term minor adverse impacts for the no-action alternative, would result in long-term minor cumulative effects.

Conclusion. Alternative A would have short-term minor adverse impacts to air quality during construction of new WTF, with long-term negligible adverse impacts during operation of the facilities. The construction, operation, and maintenance of potential future WTF is not expected to have a regional impact and would be in accordance with all provisions set forth in the SIP. Cumulative impacts for alternative A would be long-term minor adverse. Impairment to air resources and quality would not occur.

Impacts of Alternative B: Zone Management

Analysis. Impacts for alternative B would be similar to those in alternative A as right-of-way permits for WTF would be granted in the same areas of Rock Creek Park. In areas of the park where WTF would be sited, impacts from operation and maintenance would be the same as those in alternative A, with long-term, negligible to minor adverse impacts. Any additional facilities would not be expected to have a regional impact as daily emissions from these activities would be expected to be less than 10% of the regional goals established by the Metropolitan Washington Air Quality Region.

Cumulative Impacts. The impacts to air quality within Rock Creek Park units and surrounding areas on the air quality within AQCR 47 resulting from past, present, and reasonably foreseeable actions, in combination with the long-term minor adverse impacts for alternative B, would result in long-term minor cumulative effects similar to alternative A. Cumulative long-term beneficial impacts would occur as a result of roadway improvements within the park from the reduction of idling engines. The amount of concurrent construction and the number of WTF built and/or co-located, would be the defining factors in cumulative impacts.

Conclusion. Alternative B would have short-term minor adverse impacts to air quality during construction of new WTF, with long-term negligible adverse impacts during operation of the facilities. The construction, operation, and maintenance of potential future WTF is not expected to have a regional impact and would be in accordance with all provisions set forth in the SIP. Cumulative impacts for alternative B would be long-term minor adverse. Impairment to air resources and quality would not occur.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. Impacts for alternative C would be similar to those in alternative A. Alternative C differs in terms of where applicants for new WTF would be encouraged to locate. In alternative C, new facilities would be encouraged to site where existing coverage gaps appear to occur, which occur mainly along Beach Drive in the main unit of Rock Creek Park (Cityscapes Consulting 2007). Short-term emissions from construction of potential new facilities would be minor adverse, as described in alternative A.

Facilities along Beach Drive would have emissions similar to those described in alternative A, but on a localized level, these emissions would not represent a sizable increase over the emissions already in the area from automobile traffic and emissions would be more localized. However, although not a sizable increase, encouraging WTF to site along Beach Drive would concentrate emissions and would represent a local increase in emission and long-term minor adverse impacts. In the remaining areas of Rock Creek Park, applications for WTF would be evaluated under the zone management described in alternative B, resulting in the same impacts as alternative B in these areas. Although these impacts would occur, any additional WTF sited in the park would need to comply with NEPA and permits would not be approved for any facility that would not meet all applicable air quality standards. Because the NEPA process would be used as a tool to make sure any proposed future WTF meet Clean Air Act standards, any future facility would not be expected to cause a violation of conformity levels.

The construction, operation, and maintenance of WTF would not be expected to have a regional impact because daily emissions from these activities would be expected to be less than 10% of the regional goals based on emission levels of the current facilities in Rock Creek Park.

Cumulative Impacts. The impacts to air quality within Rock Creek Park units and surrounding areas on the air quality within Air Quality Control Region 47 resulting from past, present, and reasonably foreseeable actions, in combination with the long-term minor adverse impacts for alternative C, would result in long-term minor cumulative effects similar to alternative A. Cumulative long-term beneficial impacts would occur as a result of roadway improvements within the park from a reduction in idling engines. The amount of concurrent construction and the number of WTF built and/or co-located, would be the defining factors in cumulative impacts.

Conclusion. Alternative C would have short- and long-term minor adverse impacts to air quality for the construction, operation, and maintenance of WTF in Rock Creek Park units, with some emissions localized where facility siting would be encouraged. The construction, operation, and maintenance of potential future WTF is not expected to have a regional impact. Cumulative impacts for alternative C would be long-term minor adverse. Impairment to air resources would not occur.

SOUNDSCAPES

Guiding Regulations and Policies

The NPS is specifically directed to “take action to prevent or minimize all noise that, through frequency, magnitude, or duration, adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified as being acceptable to, or appropriate for, visitor uses at the sites being monitored” (NPS *Management Policies* 2006, sec. 4.9). Human-generated noise sources throughout all Rock Creek Park units include vehicular traffic; recreational activities, such as hiking, picnicking, and tennis; and noises associated with residential land uses (e.g., lawn mowers).

The NPS aims to preserve the natural soundscapes and quiet areas found within parks. To prevent noise disturbances, the NPS has created a noise limit of 82 dB registered at 82 feet distance from the source (NPS 2006a).

Since Rock Creek Park is located within the District, other local regulations are applicable to the park.

The Comprehensive Plan for the National Capital (NCPC 2004) identifies the federal interests, policies, and implementation strategies relevant to the environment in the National Capital Region, including noise. NCPC defines noise as “various levels of unwanted man-made sound that can adversely impact public health and welfare, animal habitats, and sensitive land uses” (NCPC 2004). Federal interests related to noise issues identified in the plan that apply to the siting of WTF are:

1. To eliminate, to the extent possible, human stress and health damage resulting from hazardous and disruptive noise levels;
2. To protect noise-sensitive land uses, activities, facilities, natural resources, and wildlife habitats from adverse sounds levels;
3. To encourage compatibility between noise exposure limits and land use planning;
4. To encourage federal agencies to continue to institute the policies and procedures set forth in the *Noise Control Act of 1972*; and
5. To ensure that federal facilities, where applicable, are in compliance with the noise responsibilities, standards, and strategies established for the federal community by the Environmental Protection Agency, Federal Aviation Administration, Housing and Urban Development, Federal Highway Administration, Occupational Health and Safety Administration, and the Federal Railroad Administration.

NCPC has developed the following policies to address areas of federal interest that apply to the construction, operation, and maintenance of WTF throughout Rock Creek Park:

1. Federal agencies with missions that involve excessive noise producing activities should not be located in proximity to sensitive natural resources and features so as not to disrupt wildlife habitats and natural biological systems.
2. Parks and other natural, historic, and cultural resources, which are places to escape from increasing urbanization, should be protected from excessive noise.
3. All construction activities should comply with local noise ordinances. Low noise emission products and equipment should be used in the construction and maintenance of developments in the region.
4. Impacts on adjacent land uses and manner of operation should be one of the factors considered when establishing hours of construction and when selecting construction equipment.

Title 20, Chapter 27 of the District of Columbia Municipal Regulations (District of Columbia 1979) make it public policy that every person is entitled to ambient noise levels that are not detrimental to the life, health, and enjoyment of property. Sound levels resulting from the WTF in the park would follow regulations for maximum sounds levels for a special purpose area (Section 2700.1). The maximum daytime noise level for special purpose areas is 60 dBa and the night time level is 55 dBa measured from

the property line. Maximum sound level regulations for residential districts are identical to those for a special purpose area. Maximum daytime noise level for a commercial area is 65 dBA and nighttime is 60 dBA (District of Columbia 1979).

Chapter 28 of these regulations (Section 2801.2) states that noise resulting from the use or operation of any air-conditioning, refrigerator, fan, or other mechanical equipment, regardless of location, shall be prohibited in excess of 60 dBA when measured at the property line or as close to the property line as practical if there is an obstruction. Section 2802 of the District of Columbia Municipal Regulations details requirements and restrictions associated with construction noise. These regulations state that between 7:00 a.m. and 7:00 p.m. on any weekday, noise levels resulting from construction or demolition (excluding pile drive devices) shall not exceed 80 dBA, unless granted a variance. Between 7:00 p.m. and 7:00 a.m., noise levels stated in Section 2701 apply. Measurements for construction or demolition noise shall be made from 25 feet from the outermost limits of the construction site. No permit for construction or demolition shall be issued until the permit applicant has assured in writing that the noise emanating from the planning construction will comply with the limitations established by Section 2802.

Methodology and Assumptions

The methodology used to assess noise impacts from the construction, operation, and maintenance of WTF in this document is consistent with the NPS *Management Policies 2006*, and Director's Order #47: *Soundscape Preservation and Noise Management*, and the reference manual for Director's Order #47. Park-specific factors related to context, time, and intensity are discussed below, and then integrated into a discussion of the impact thresholds used in this analysis.

Potential impacts to the soundscape in the study area were evaluated based on the existing sound levels in comparison to potential sound levels associated with each of the alternatives. This evaluation is a qualitative assessment.

Short- and long-term noise levels were considered. Short-term noise impacts would result from the construction of WTF and long-term noise impacts would result from the operation and maintenance of additional WTF. These two activities would not occur at the same time for any given WTF and were considered separately.

The length of construction was estimated based on the time required to construct the existing facilities. For operational noise, the length and timing of noise emanating from the cooling fans associated with the equipment buildings was determined through field visits to the existing WTF present at Rock Creek Park and from updated information regarding the current equipment from Verizon Wireless. Industry specifications on the cooling fans were used to determine noise levels associated with their operation. When originally installed, each facility contained a cooling unit that generated a noise level of 73 dBA at 5 feet from the unit operating at approximately 2 or 3 minute intervals, daily. These cooling units were replaced at the tennis center and maintenance yard in November 2003 and September 2007, respectively. The original Marvair units were replaced by five ton Liebert units that contain a feature called Quiet Line. The Quiet Line feature provides sound attenuation equipment to minimize the sound coming from the cooling units, with noise levels below 58 dBA at the source. These new units also operate a 2 or 3 minute intervals, daily (R. Posilkin, Verizon Wireless, pers. comm., L. Gutman, The Louis Berger Group Inc., December 14, 2007 and December 27, 2007; Emerson Electric Co. 2006).

Another source of noise at WTF would be the emergency generator that would be located within the equipment buildings. Currently at Rock Creek Park, the existing emergency generators are tested every week for a one hour period between during day-light hours. The generators, which were replaced in April 2007 at both sites, are 60KW Katolight diesel units (R. Posilkin, Verizon Wireless, pers. comm., L.

Gutman, The Louis Berger Group Inc., December 14, 2007). The noise level produced by these units is approximately 69 to 73 dBa, 23-feet from the unit (Katolight 2007).

In this assessment, noises resulting from the operation and maintenance of the WTF include the air conditioning units and emergency generator in each equipment building. Noise data used for this analysis were obtained from the manufacturer of the air conditioning units, Liebert, and the manufacture of the emergency generator, Katolight.

Assumptions made for the analysis included:

5. All Rock Creek Park units are characterized by a variety of recreational uses ranging from passive uses, such as hiking, to active uses such as the golf and tennis. Sites outside the park are characterized by residential, religious, business, and educational uses. Resources throughout Rock Creek Park units and the surrounding sites that are most likely to be affected by noise from the construction, operation, and maintenance of WTF include picnic areas, hiking trails, areas around park roadways, as well as the park's natural and noise-sensitive wildlife and residential uses surrounding the park system.
6. Noise from construction activities would be short-term and only occur during the 90-day construction period for any additional facility built. It is assumed that the construction activities would be confined to normal working hours and noise-controlled construction equipment would be employed to the extent possible. Arrival of heavy equipment and materials was assumed to occur during normal work hours to the greatest extent possible to avoid disturbing park users and other surrounding land uses.
7. Long-term noise levels associated with the operation and maintenance of any additional facilities would include noise from cooling fans and emergency generators located in the equipment building of each facility. It is assumed that the noise levels of new facilities would be comparable to the existing facilities, including generator testing and usage. It could be expected, that as technology advanced, the noise levels created by the generators and cooling fans would decrease, as has already occurred with the two existing WTF. This WTF plan/EA uses current technology as the baseline, but future noise levels may be softer.
8. The current emergency generators are tested once a week for one-hour during daylight hours. It is expected that any additional generators would produce noise levels similar or slightly higher than the noise levels produced from the cooling units. These noise levels would comply with all applicable regulations including the NPS, EPA, and the District.
9. The levels of sound generated by the construction and operation of WTF would be expected to affect recreation users and residential uses differently. For example, visitors participating in less sound-intrusive activities such as hiking and/or biking would likely be more adversely affected by the associated noise than a visitor to the tennis center. Additionally, residential areas surrounding the smaller park units may be affected more than a driver along Beach Drive. This analysis also assumed that ambient noise levels in Rock Creek Park include natural sounds, other visitors, and traffic on the surrounding road network.

Study Area

The study area when considering potential impacts from noise is all Rock Creek Park units and lands adjacent outside the park where WTF could potentially be sited.

Impact Thresholds

Given this methodology and the accompanying assumptions, the following criteria have been developed to assess the noise impacts for each of the alternatives:

- Negligible:** Natural sounds would prevail; noise generated by WTF construction, operation, or maintenance would be infrequent or absent, mostly immeasurable.
- Minor:** Natural sounds would be predominant in areas where management objectives call for natural processes to dominate. In areas where noise generated by WTF construction, operation, or maintenance is consistent with park purpose and objectives, associated noise could be heard frequently throughout the day at moderate levels, or infrequently at higher levels, and natural sounds could be heard occasionally.
- Moderate:** In areas where management objectives call for natural processes to dominate, natural sounds would predominate, but noise generated by WTF construction, operation, or maintenance could occasionally be present at low to moderate levels. In areas where noise generated by these activities is consistent with park purpose and objectives, noise would predominate during daylight hours and would not be overly disruptive to noise-sensitive visitor activities in the area; in such areas, natural sounds could still be heard occasionally.
- Major:** In areas where management objectives call for natural processes to dominate, natural sounds would be impacted by human noise sources frequently or for extended periods of time at moderate intensity levels (but no more than occasionally at high levels), and in a minority of the area. In areas where noise generated by WTF construction, operation, or maintenance consistent with park purpose and zoning, natural sounds would be impacted most of the day by noise at low to moderate intensity levels, or more than occasionally at high levels; noise would disrupt conversation for long periods of time and/or make enjoyment of other activities in the area difficult; natural sounds would rarely be heard during the day.
- Impairment:** The level of noise associated with WTF construction, operation, and maintenance would be heard consistently and would be readily perceived by other visitors throughout the day, especially in areas where such noise would potentially conflict with the intended use of that area. In addition, these major impacts (described above) to park resources and values would: contribute to deterioration of the park's soundscape to the extent that the park's purpose could not be fulfilled as established in its enabling legislation; affect resources key to the park's natural or cultural integrity or opportunities for enjoyment; or affect the resource whose conservation is identified as a goal in the park's general management plan or other park planning documents.

Duration:

Short-term effects would last during construction of a facility, typically from 1 to 3 months.

Long-term effects would be anything beyond the construction of a facility through the life of the facility, including maintenance activities.

Impacts of Alternative A: No-Action Alternative

Analysis. In alternative A, permit applications for WTF would be evaluated within all Rock Creek Park units, but in certain zones/areas where sensitive natural and cultural resources occur (see the “Elements Common to All Alternatives” section in chapter 2) the permit request would not be approved. In those areas where permits are approved, impacts to park soundscapes would occur during the construction of these facilities and during operation. Operational impacts would include noise from cooling fans, emergency generators, and vehicle traffic accessing the site for maintenance. The operation of additional cooling units and generators from new WTF would not produce noise levels that exceed park standards, based on the available data on the existing cooling unit sound levels.

The assessment of potential noise impacts from additional WTF assumes that equipment buildings associated with new facilities could be located in any unit of Rock Creek Park where could be sited, with each facility having its own cooling system. As stated above, a cooling system similar to the system currently in use by the two existing WTF would produce a noise level of 58 dBA or lower at the source. This noise level would decrease by approximately 6 dBA as the distance from the source doubles, resulting in a noise level below 20 dBA 80 feet from the source, well below the NPS standards stated in the above methodology. These noise levels would also be compliant with District of Columbia noise regulations stated above.

It is assumed that construction activities for additional WTF would comply with all applicable District, NPS, and other related regulations. By complying with these regulations, noise from construction activities would not exceed regulated levels, and would be short-term in nature lasting only during the time of construction, or approximately 90 days based on the construction time for the existing two WTF.

Adverse impacts from construction, operation, and maintenance activities would affect areas of the park differently. In some zones, such as those along Beach Drive, near the tennis center, or within traffic circles, the additional noise from the operation and maintenance of new WTF would be less noticeable and would create less of an impact as these areas are higher use areas with higher ambient levels of noise. In smaller park units located in residential areas, such as Glover-Archbold Park and Whitehaven Parkway, increased noise generated by new or additional WTF may be more noticeable, especially during construction. In any unit or area of Rock Creek Park that does not support more intensive uses such as commuting, noise during construction and operation would have a greater localized impact, resulting in short- and long-term moderate adverse impacts. In the highly traveled commuter roadways throughout the park, such as Rock Creek and Potomac Parkway and Beach Drive, as well as the areas with high visitation and activity levels, the impacts from construction and operations would come from the same sources but would be short- and long-term minor adverse, due to a higher ambient noise level. Additionally, operation and maintenance of facilities within these locations would be minor, long-term and adverse because of the higher ambient noise level produced by cooling systems, generators, and other mechanisms.

In alternative A, co-location on the two existing WTF would require less construction as only an equipment cabinet, and not an antenna support structure, would need to be constructed. Impacts to soundscapes related to co-location on existing or future facilities would be short-term negligible adverse during construction, but would have the same impacts during operation as described above (long-term minor adverse).

Cumulative Impacts. Projects that would contribute to cumulative impacts to the park’s soundscapes include on-going activities at the Carter Barron Amphitheater and the tennis center, as well as DDOT projects. Any construction that would occur within the same park unit would increase the overall impact to the soundscape during the period of construction. Once the construction period is over, operational impacts would occur from increased traffic on newly opened or improved roads. The relocation of the

U.S. Park Police facility would increase the potential for concurrent construction, therefore adversely impacting noise levels during the short-term. Commuter traffic is expected to continue to contribute to existing noise levels throughout the traffic corridors within or around Rock Creek Park units.

The impacts to park soundscapes resulting from these past, present, and future actions, in combination with the long-term minor adverse impacts for the no-action alternative, would result in long-term moderate adverse impacts to soundscapes.

Conclusion. Due to the potentially sensitive nature of some areas of the park, long-term adverse impacts to soundscapes from alternative A would range from minor to moderate, based on the location of the facility. During construction, short-term minor to moderate adverse impacts would be expected due to the use of heavy equipment depending on their location. Cumulative impacts for alternative A would long-term moderate adverse. Impairment to park soundscapes would not occur.

Impacts of Alternative B: Zone Management

Analysis. Impacts to noise for alternative B would be the similar as those in alternative A. All noise levels would be in compliance with NPS, NCPC, and District of Columbia regulations described under the methodology above. Impacts for alternative B would differ from those in alternative A as zones and areas where applications for WTF could be granted are better defined, with specific permit terms and conditions for each zone or area. These permit terms and conditions call for the use of certain types of technology and equipment that would ensure the latest technology is being used and would minimize impacts to park soundscapes. This technology, along with compliance with all applicable noise regulations, would result in long-term minor impacts to soundscapes in the areas or zones of the park detailed for alternative B.

In some zones, such as those along Beach Drive or near the tennis center, the additional noise from the operation and maintenance of new facilities would be less noticeable and create less of an impact, as described in alternative A. In smaller park units located in residential areas, such as Glover-Archbold Park and Whitehaven Parkway, increased noise generated by these facilities may be more noticeable, especially during construction.

As in alternative A, construction activities for additional WTF and other construction projects within Rock Creek Park units are assumed to comply with all applicable District, NPS, and other related regulations. By complying with these regulations, noise from construction activities would not exceed regulated levels. Alternative B also allows for co-location with the existing facilities, and future WTF, with impacts for co-location the same as in alternative A.

In alternative B, adverse impacts to soundscapes during construction would be short-term minor to moderate and adverse, depending in which zone the construction would occur. Long-term adverse impacts from operation and maintenance would be minor.

Cumulative Impacts. Cumulative impacts from alternative B would be similar to cumulative impacts from alternative A. Projects that would increase cumulative impacts to the project area's soundscapes include on-going activities at the Carter Barron Amphitheater and the tennis center, as well as DDOT projects. Any construction that would occur within the same park unit as WTF construction would increase the overall impact to the soundscape. The relocation of the U.S. Park Police facility would increase the potential for concurrent construction, therefore adversely impacting noise levels at a short-term, minor level. The cumulative long-term impact of the operation and maintenance of additional WTF would be dependant on where those facilities were located. It is expected that long-term adverse impacts would be mainly minor, based on location of the site, with moderate impacts occurring in areas that are

more sensitive to sound. Commuter traffic is expected to continue to contribute to existing noise levels throughout the traffic corridors within or around Rock Creek Park units.

The impacts to soundscapes in the area resulting from these past, present and future actions, in combination with the long-term negligible adverse impacts for alternative B, would result in long-term negligible adverse impacts to soundscapes.

Conclusion. Due to the potentially sensitive nature of some areas of the park, short- and long-term adverse impacts to soundscapes from alternative B would range from minor to moderate, based on the location of the facility. The requirement for certain types of technologies in certain zones and areas of the park would result in these impacts mainly being minor. Cumulative impacts for alternative B would long-term minor to moderate adverse. Impairment to park soundscapes would not occur.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, the siting of potential new WTF would encouraged where there are apparent coverage gaps within the park (Cityscapes Consulting 2007). These locations are mainly along Beach Drive, where ambient noise levels are higher than through other portions of the park.

It is assumed that the majority of applications received by the park for WTF right-of-way permits would be in the areas where there are coverage gaps along Beach Drive. Beach Drive is heavily traveled by Washington, D.C. commuters and other visitors to the park; therefore, the ambient noise level is higher along this corridor than in other areas of the park. Construction activities for WTF in these areas would comply with all applicable District, NPS, and other related regulations. By complying with these regulations, noise from construction activities would not be expected to exceed regulated levels. Construction activities in this area would have a short-term minor adverse impact to the soundscape, as natural sounds are not predominant and some level of human noise is expected.

During operation and maintenance activities, long-term adverse impacts of noise would be negligible. Noise generated by cooling fans or generators would not be expected to disrupt the soundscape in these areas, which is not dominated by natural sounds and already has a high level of ambient noise. Encouraging WTF to site areas with coverage gaps decreases the possibility that facilities would be sited in the areas with resources that are the most sensitive to noise, resulting in short-term minor impacts during construction and long-term negligible impacts during operation.

In those areas where there is not a gap in coverage, could be sited and evaluated by zone or area Using the framework described in alternative B, resulting in short- and long-term minor to moderate impacts, depending on how sensitive the resources in the zone or area are to noise.

Cumulative Impacts. Actions that would contribute to cumulative impacts to soundscapes include on-going activities at the Carter Barron Amphitheater and the tennis center, as well as DDOT projects. Any construction that would occur within the same park unit as WTF construction would increase the overall impact to the soundscape. The relocation of the U.S. Park Police facility would increase the potential for concurrent construction, therefore adversely impacting noise levels at a short-term, minor level. The cumulative long-term impact of the operation and maintenance of additional WTF facilities would be negligible and adverse as even when combined with the construction and operation of other projects, the construction and operation of WTF would not likely occur in areas where natural sounds are predominant and would not have a noticeable impact on the soundscapes of these areas, as facilities would be encouraged to site in areas with higher ambient noise levels. Commuter traffic is expected to continue to contribute to existing noise levels throughout the traffic corridors within Rock Creek Park units.

The impacts to soundscapes in the area resulting from these past, present and future actions, in combination with the long-term negligible adverse impacts for alternative C, would result in long-term negligible adverse impacts to soundscapes.

Conclusion. Applicants for WTF would be encouraged to site in areas with coverage gaps, which have levels of high ambient noise, resulting in short-term minor adverse and long-term negligible adverse impacts. In those areas of the park where there are no coverage gaps, there would be short- and long-term minor to moderate impacts, depending on how sensitive the resources in the zone or area are to noise. Cumulative impacts for alternative C would be long-term negligible adverse. Impairment to park soundscapes would not occur.

CULTURAL RESOURCES

Guiding Regulations and Policies

Federal actions that have the potential to affect cultural resources are subject to a variety of laws and regulations. The National Historic Preservation Act of 1966, as amended, is the principal legislative authority for managing cultural resources associated with NPS projects. Generally, Section 106 of the NHPA requires all federal agencies to consider the effects of their actions on cultural resources listed and/or determined eligible for listing in the National Register. Such resources are termed “historic properties.” Agreement on mitigation of adverse effects to historic properties is reached through consultation with the State Historic Preservation Officer; Tribal Historic Preservation Officer, if applicable; and, as required, the Advisory Council on Historic Preservation (Advisory Council). In addition, the NHPA requires that federal agencies take actions to avoid, minimize, and mitigate harm to historic properties that would be adversely affected by a federal undertaking. Section 110 of the NHPA also charges federal agencies with responsibility for establishing preservation programs for the identification, evaluation, and nomination of historic properties to the National Register.

Other important laws and regulations designed to protect cultural resources include:

- *Native American Graves Protection and Repatriation Act* (NAGPRA), 1990
- *American Indian Religious Freedom Act* (AIRFA), 1978
- *National Environmental Policy Act* (NEPA), 1969
- *Archeological Resources Protection Act* (ARPA), 1979
- Executive Order #11593, Protection and Enhancement of the Cultural Environment, 1971

In addition, the NPS is charged with the protection and management of cultural resources in its custody. This is furthered through the implementation of Director’s Order #28: *Cultural Resources Management Guidelines* (NPS 1998), *NPS Management Policies 2006*, and the 1995 Servicewide Programmatic Agreement with the Advisory Council and the National Conference of State Historic Preservation Officers. These documents charge NPS managers with avoiding, or minimizing to the greatest degree practicable, adverse impacts on park resources and values. Although the NPS has the discretion to allow certain impacts in parks, that discretion is limited by the statutory requirement that park resources and values remain unimpaired, unless a specific law directly provides otherwise.

General Methodology and Assumptions

The analyses of effects on cultural resources that are presented in this section respond to the requirements of both NEPA and Section 106 of the NHPA. In accordance with the Advisory Council's regulations implementing Section 106 (36 CFR Part 800, *Protection of Historic Properties*), impacts on cultural resources were identified and evaluated by (1) determining the Area of Potential Effects (APE); (2) identifying cultural resources present in the APE that are either listed in or eligible to be listed in the National Register (i.e., historic properties); (3) applying the criteria of adverse effect to affected historic properties; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the implementing regulations for Section 106, a determination of either *adverse effect* or *no adverse effect* must be made for affected historic properties. An adverse effect occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register (for example, diminishing the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association). Adverse effects also include reasonably foreseeable effects caused by the proposed alternative that would occur later in time, be farther removed in distance, or be cumulative (36 CFR Part 800.5). A determination of *no adverse effect* means there is either no effect or that the effect would not diminish, in any way, the characteristics of the cultural resource that qualify it for inclusion in the National Register.

CEQ regulations and the NPS *Conservation Planning, Environmental Impact Analysis and Decision-making* (Director's Order #12) also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. Cultural resources are non-renewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section 106 may be mitigated, the effect remains adverse.

The NPS guidance for evaluating impacts (Director's Order #12, *Conservation Planning, Environmental Impact Analysis, and Decision-Making*) (NPS 2001) requires that impact assessment be scientific, accurate, and quantified to the extent possible. For cultural resources, it is seldom possible to measure impacts in quantifiable terms; therefore, impact thresholds must rely heavily on the professional judgment of resource experts.

A summary is included in this impact analysis section for historic resources, cultural landscapes, and archeological resources to comply with Section 106. The impact analysis is an assessment of the effect, based upon the Advisory Council's criteria of adverse effect, of the undertaking (implementation of the alternative) on National Register eligible or listed cultural resources only.

HISTORIC RESOURCES

The term "historic resources" refers to buildings, structures, objects, above-ground sites, and districts listed on or eligible for listing on the National Register. In order for an historic resource to be listed on the National Register it must be associated with an important historic context. In other words, it must possess significance — the meaning or value ascribed to the historic resource — and retain the integrity of those character-defining features necessary to convey its significance (i.e., location, design, setting, workmanship, materials, feeling, and association; see National Register Bulletin #15, *How to Apply the National Register Criteria for Evaluation*; NPS 1995). Impact analyses under NEPA and Section 106 examine the manner and degree to which the proposed alternatives impact or affect the qualities and

integrity of the individual historic resource's character-defining features, significance, and National Register eligibility.

Study Area

The study area for the evaluation of potential effects to historic resources encompasses the boundaries of the National Register listed and eligible components of Rock Creek Park. The National Register listed or eligible components of Rock Creek Park potentially impacted by the WTF plan's alternatives include:

- the Rock Creek Park Historic District
- the Rock Creek and Potomac Parkway Historic District
- Glover-Archbold Park
- the Francis Griffith Newlands Memorial Fountain and two commemorative stone markers at Chevy Chase Circle
- the Artemus Ward statue at Ward Circle
- two commemorative stone markers at Westmoreland Circle, and
- memorial statues located in four of Rock Creek's "Triangle" parks

The NPS also considers a dedication plaque at Grant Circle and a stone culvert in the Whitehaven Parkway as significant objects worthy of protection and preservation. Descriptions of the above historic resources are contained in "Chapter 3: Affected Environment."

In addition to the above historic resources, the park encompasses several other National Register listed units. As described in "Chapter 2: Alternatives," these units, the Fort Circle Parks, Dumbarton Oaks, and Montrose Park, comprise smaller parks or historic resources that the NPS recognizes would be adversely affected by the placement of any WTF within their boundaries. Although not currently formalized by written policy, the NPS has determined that right-of-way permits for WTF in these park units would not be granted because installation would conflict with the mission of these park units.

Impact Thresholds

For purposes of analyzing potential impacts to historic resources, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: The impact would be at the lowest level of detection or barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Adverse impact — The impact would not affect the character-defining features of a historic resource listed on or eligible for listing on the National Register. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact — The character-defining features would be stabilized and/or preserved in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995) to maintain the existing integrity of the historic resource. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: Adverse impact — The impact would alter a character-defining feature(s) of the historic resource but would not diminish the integrity of the resource to the extent that its National Register eligibility would be jeopardized. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact — The historic resource would be rehabilitated in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* to make possible a compatible use of the property while preserving its character-defining features. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: Adverse impact — The impact would alter a character-defining feature(s) of the historic resource, diminishing the integrity of the resource to the extent that it is no longer eligible to be listed on the National Register. For purposes of Section 106, the determination of effect would be *adverse effect*.

Beneficial impact — The historic resource would be restored in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* to depict accurately its form, features, and character as it appeared during its period of significance. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Rock Creek Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant NPS planning documents.

Duration: All impacts to historic structures are considered long-term.

Impacts of Alternative A: No-Action Alternative

Analysis. In the no-action alternative, the construction of new WTF would potentially create long-term minor adverse impacts to one or more of the park's National Register listed and eligible historic resources. In the no-action alternative applications would be reviewed under all applicable authorities, and would take the park's management documents, such as the GMP, into consideration evaluating where WTF applications. During the review process, these management documents, including the GMP zones, would be used to determine the planned uses for park area and if WTF would fit into that planned use. For the purposes of the WTF application process, the Cultural Resource Zone, an area identified in the park's GMP as encompassing Fort DeRussy, the Peirce Mill, the Peirce-Klingel Mansion, and the Godey Lime Kilns, includes all contributing elements of any historic resource within the park. Consideration of the GMP when evaluating WTF applications would not allow impacts to Fort DeRussy, the Peirce Mill, the Peirce-Klingel Mansion, and the Godey Lime Kilns, as well as to any contributing element of an historic resource within the park. There are also areas of overlap between the Cultural Resource Zone and many of the other zones that would permit the application for and potential siting of WTF within historic resources of the park. The Valley Floor Automobile Access Zone primarily encompasses Beach Drive, a contributing element to the Rock Creek Park Historic District, while the Rock Creek and Potomac Parkway Zone encompasses contributing elements of Rock Creek and Potomac Parkway Historic District. The Lodge House, also known as the Visitor Center/Park Police Substation, comprises part of the Visitor Facility Zone but also contributes to the Rock Creek Park Historic District. Similarly, the Golf Course, a

contributing element to the Rock Creek Park Historic District, comprises part of the Urban Recreation Zone. Some of the smaller units managed by Rock Creek Park, such as the triangle parks and traffic circles, have been listed or determined eligible for listing on the National Register. Large portions of the Rock Creek Park Historic District also fall within the Forest Zone, a zone where applications for WTF would not be granted.

The continued implementation of the current application process would evaluate applications for WTF that do not impact contributing elements of historic resources within the Cultural Resource Zone, as well as in areas of historic resources located in the zone overlap areas. Installation of the new WTF, however, would introduce new elements into the broader settings of the park's historic resources. As a result, impacts to the park's historic resources resulting from alternative A would be long-term, minor, and adverse. Under Section 106, the WTF application process outlined in alternative A, would have no adverse effect on historic resources.

Cumulative Impacts. Past, present, and future actions that may have an impact on the park's historic resources include the projects listed under cultural resources under table 21, "Cumulative Impact Scenario." Many of these projects, such as the development of the GMP, the development of cultural landscape reports for various park units, the preparation of parkwide archeological surveys, and the rehabilitations of Peirce Mill and the Klinge Mansion stonework, would protect and rehabilitate park resources and would therefore be considered moderate beneficial impacts to these historic resources. Other projects such as the District Department of Transportation's Klinge Road and Capital improvement programs and corridor studies, would potentially have long-term minor adverse impacts on the park's historic resources due to the introduction of improved roadway facilities adjacent to the park's historic resources. Replacement of the Nature Center roof and the proposed renovations at the Carter Barron Amphitheatre would have long-term negligible beneficial impacts on the park's historic resources. The proposed moving of the D-3 Park Police facility to area H-3 may prove to be a long-term moderate beneficial impact since it may enable park staff to rehabilitate the D-3 facility, also known as the Lodge House and a contributing element to the Rock Creek Park historic district, and incorporate the building into the park's interpretation program and mission. Plans for subdivision and development of the Tregaron Estates would likely have a long-term minor adverse impact on some of the park's historic resources by altering the setting of lands adjacent to the park's historic resources.

The impacts on the park's historic resources resulting from these past, present and future actions, in combination with the long-term minor adverse impacts for the no-action alternative, would continue to result in long-term minor adverse cumulative impacts (no adverse effect under Section 106).

Conclusion. The potential siting of new WTF within historic resources listed or eligible for the National Register under the proposed application process described in alternative A would have minor long-term adverse impacts (*no adverse effect* under Section 106) on historic resources as the park's management documents would prevent WTF applications from being granted in areas with sensitive cultural resources. Cumulative impacts would be long-term minor and adverse (*no adverse effect* under Section 106). Impairment to historic resources would not occur for alternative A.

Impacts of Alternative B: Zone Management

Analysis. Similar to alternative A, the construction of new WTF in alternative B would potentially create long-term minor adverse impacts to one or more of the park's National Register listed and eligible historic resources.

As described in alternative A, applications for WTF that do not impact contributing elements of historic resources within the Cultural Resource Zone, as well as applications for WTF in areas of historic

resources located in the zone overlap areas, could be granted. The more formalized zone management process and established terms and conditions for proposed new WTF would greatly limit the intensity of impacts to historic resources for alternative B and would be unlikely to result in direct impacts to character-defining features of the park's historic resources. Generally, applications for undisguised tower facilities would not be granted and the newest technologies would be utilized in all zones in order to restrict visual impacts, associated equipment cabinets would be concealed, and co-location would be encouraged where existing infrastructure can provide the desired coverage. Impacts to the park's historic resources resulting from alternative B would be long-term, minor, and adverse. Under Section 106, the WTF application process outlined in alternative B, would have *no adverse effect* on historic resources.

Cumulative Impacts. Actions that would contribute to cumulative impacts for alternative B are the same as those described in alternative A. Similar to alternative A, impacts from past, present, and future projects planned for Rock Creek Park and adjacent areas include long-term moderate to major beneficial impacts, negligible impacts, and minor long-term adverse impacts.

The impacts on the park's historic resources resulting from these actions, in combination with the long-term minor adverse impacts of siting new WTF utilizing zone management as outlined in alternative B, would continue to result in minor long-term adverse cumulative impacts (*no adverse effect* under Section 106) because these projects do not lessen or increase the potential impacts of construction and installation new WTF within the park's historic resources as outlined in alternative B.

Conclusion. The potential siting of new WTF within historic resources listed or eligible for the National Register under the proposed application process outlined in alternative B would have long-term minor adverse impacts (*no adverse effect* under Section 106) on historic resources, with the set permit terms and conditions providing beneficial impacts. Cumulative impacts would also be long-term minor and adverse (*no adverse effect* under Section 106). Impairment to historic resources would not occur for alternative B.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, applicants for construction of new WTF would be encouraged to site WTF in areas of existing coverage gaps, primarily along Beach Drive, a contributing element of the Rock Creek Park Historic District. In this area, specific permit terms and conditions would be applied to WTF applicants that would offer a certain level of protection the historic structures in that area. Alternative C also evaluates applicants for proposed WTF in areas and zones beyond the recognized coverage gap, with applications being assessed using the zone management structured described in alternative B. New WTF in the park would be required to incorporate the newest technology that is disguised and meet specified size and height limitations in order to ensure that the facilities blend in with the natural and cultural environment of the roadway's setting.

Impacts from encouraging WTF applications in areas of known coverage gaps along Beach Drive, and evaluating WTF applications in other areas/zones using the framework described in alternative B would range from negligible to minor long-term adverse to the park historic district, primarily due to the location of equipment cabinets along the roadway corridor. While implementation of the permit's terms and conditions should effectively mask most of the facility's physical characteristics, the WTF would still introduce a new element into the historic district's environment. One such facility installed along Beach Drive or other area would likely be barely noticed by passing motorists and pedestrians in the park and would have a negligible impact. Multiple new facilities installed along Beach Drive or in one general location would probably increase awareness of the facilities among park users despite the use of stealth technology and implementation of the permit's conditions. Although multiple new elements could be

introduced into the historic district along Beach Drive, it is expected that compliance with NEPA, Section 106, and other applicable laws and policies as part of the application process would ensure that physical impacts to character-defining features of the historic district do not occur, thus resulting in minor long-term adverse impacts. In terms of Section 106, this alternative would have *no adverse effect* on historic resources.

Cumulative Impacts. Similar to alternative A, impacts from past, present, and future projects planned for Rock Creek Park and adjacent areas range from moderate to major beneficial long-term impacts to negligible impacts to minor long-term adverse impacts.

The impacts on the park's historic resources resulting from these actions, in combination with the negligible to minor long-term adverse impacts of encouraging new WTF along Beach Drive and evaluating applications for WTF in other areas of Rock Creek Park would continue to result in negligible to minor long-term minor adverse cumulative impacts (*no adverse effect* under Section 106). These projects do not lessen or increase the potential impacts of encouraged construction and installation of new WTF along Beach Drive or other areas as outlined in alternative C.

Conclusion. Installation of one or more WTF along Beach Drive or in other areas of Rock Creek Park subject to specific permit terms and conditions that would utilize the newest and disguised technology and conditions regarding size and height of the facilities would have negligible to minor long-term adverse impacts (no adverse effect under Section 106) on the Rock Creek Park Historic District for alternative C depending on the number of WTF established in any one area. Cumulative impacts from the combination of these impacts with those from past, present, and future actions would remain negligible to minor long-term adverse impacts (no adverse effect under Section 106). Impairment to historic resources would not occur for alternative C.

CULTURAL LANDSCAPES

Cultural landscapes are the result of the long interaction between people and the land, and reflect the influence of human beliefs and actions over time upon the natural landscape. Shaped through time by historical land-use and management practices, as well as politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, and a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes, making them a valuable source of information about specific times and places on one hand, but rendering their long-term preservation a challenge on the other.

In order for a cultural landscape to be listed on the National Register, it must possess significance (the meaning or value ascribed to the landscape) and retain the integrity of those features necessary to convey its significance. The character-defining features of a cultural landscape include spatial organization and land patterns; topography; vegetation; circulation patterns; water features; and structures/buildings, site furnishings, and objects. Individual features of the landscape are never examined alone but only in relationship to the overall landscape. The arrangement and interrelationships of a cultural landscape's organizational elements and character-defining features provide the key to determining the potential impacts and effects of proposed undertakings on a cultural landscape (see *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes*; Birnbaum 1996).

Study Area

The study area for the analysis of potential impacts to cultural landscapes includes several significant landscapes comprising part of the park's units. Rock Creek Park comprises a cultural landscape

considered eligible for listing on the National Register by the NPS as an historic designed landscape. The park contains two component landscapes, Linnaean Hill (including the Peirce-Klingling Mansion) and the Peirce Mill, that contribute to the significance of the Rock Creek Park cultural landscape and that comprise individually eligible landscape elements (NPS 1998). In addition to Rock Creek Park and its two component landscapes, the following cultural landscapes have been identified by the NPS within the park:

- Fort DeRussy
- the Rock Creek and Potomac Parkway
- Glover-Archbold Park
- Whitehaven Parkway
- Chevy Chase Circle
- Grant Circle
- Sherman Circle, and
- the Triangle Parks

Impact Thresholds

For purposes of analyzing potential impacts to cultural landscapes, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: The impact is at the lowest levels of detection or barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Adverse impact — The impact would not affect the character-defining features of a cultural landscape listed on or eligible for listing on the National Register. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact — Character-defining features would be preserved in accordance with the *Secretary of the Interior's Standards*, therefore maintaining the integrity of the cultural landscape. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: Adverse impact — The impact would alter a character-defining feature or features of the cultural landscape but would not diminish the integrity of the landscape to the extent that its National Register eligibility would be jeopardized. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Beneficial impact — The landscape or its features would be rehabilitated in accordance with the *Secretary of the Interior's Standards* to make possible a compatible use of the landscape while preserving its character-defining features. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: Adverse impact— The impact would alter a character-defining feature(s) of the cultural landscape, diminishing the integrity of the resource to the extent that it would no longer be eligible to be listed on the National Register. For purposes of Section 106, the determination of effect would be *adverse effect*.

Beneficial impact — The cultural landscape would be restored in accordance with the *Secretary of the Interior's Standards* to accurately depict the features and character of a landscape as it appeared during its period of significance. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing's general management plan or other relevant NPS legislation or proclamation of Rock Creek Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's planning documents.

Duration: All impacts to cultural landscapes are considered long-term.

Impacts of Alternative A: No-Action Alternative

Analysis. Impacts to cultural landscapes would be similar to the impacts for historic resources for alternative A. In the no-action alternative, the construction of new WTF, including new antenna support facilities and access roads or driveways, would potentially create long-term minor adverse impacts to one or more of the park's National Register listed or eligible cultural landscapes. The park's GMP, which would be the management document used to determine planned land uses in the park when evaluating applications in Reservation 339, establishes several zones to guide the NPS's management and planning for the park. For the purposes of the WTF application process, the Cultural Resource Zone, an area identified in the park GMP as encompassing Fort DeRussy, the Peirce Mill, the Peirce-Klingling Mansion, and the Godey Lime Kilns, includes all contributing elements of any historic resource within the park, including cultural landscapes. The application process would not allow impacts to these resources, including cultural landscapes, within the park.

As outlined in the impact analysis of historic resources in alternative A above, the current GMP and other applicable laws, regulations, policies, and guidelines require the protection of the park's historic resources, including cultural landscapes within the Cultural Resource Zone. Right-of-way permits for WTF that impact contributing elements of cultural landscapes would not be granted in the Cultural Resource Zone. Requirements that impacts to viewshed be analyzed in the required NEPA document to ensure significant views from and into cultural landscapes are not impacted and that stealth technologies be utilized to limit visual impacts to cultural landscapes would greatly reduce the potential for impacts to the parks cultural landscapes.

Areas of overlay between the Cultural Resources Zone containing the parks cultural landscapes and other GMP zones may result in right-of-way permits for WTF potentially being granted in cultural landscape areas. Impacts would be indirect to any cultural landscape's character-defining features. Installation of new WTF, however, would introduce new elements into a cultural landscape's spatial organization, land patterns, topography, vegetation, and circulation patterns. As a result, impacts to the park's cultural landscapes resulting from alternative A would be long-term, minor, and adverse. Potential impacts to viewsheds would be further evaluated during the NEPA process for each individual facility through methods such as balloon tests, visual simulations, and other methods for analyzing viewsheds. Under

Section 106, the WTF application process outlined in alternative A, would have *no adverse effect* on cultural landscapes.

Cumulative Impacts. Past, current, and future actions that may have an impact on the park's cultural landscapes include the projects listed under cultural resources under table 21, "Cumulative Impact Scenario," at the beginning of this chapter. Similar to the impacts described in the analysis of historic resources, many of these projects, such as the development of the GMP, the development of cultural landscape reports for various park units, the preparation of parkwide archeological surveys, and the rehabilitations of Peirce Mill and the Klinge Mansion stonework, would protect and rehabilitate park resources and would therefore be considered moderate beneficial impacts to these cultural landscapes. The DDOT Klinge Road and Capital improvement programs and corridor studies, would potentially have long-term minor adverse impacts on the park's cultural landscapes due to the introduction of improved roadway facilities adjacent to the landscapes. Replacement of the Nature Center roof and the proposed renovations at the Carter Barron Amphitheatre would have negligible impact on the park's landscapes. Moving the D-3 Park Police facility to area H-3 may provide a long-term moderate beneficial impact since it would enable park staff to rehabilitate the D-3 facility and more efficiently incorporate the building into the park's interpretation of the Rock Creek Park cultural landscape. Plans for subdivision and development of the Tregaron Estates would likely have a negligible impact on the Rock Creek Park cultural landscape.

Impacts on the park's cultural landscapes resulting from these past, present and future actions, in combination with the long-term moderate adverse impacts of the current WTF application process, would continue to result in long-term minor adverse cumulative impacts (*no adverse effect* under Section 106) because these projects do not lessen or increase the potential impacts of construction and installation of new WTF on the park's cultural landscapes as outlined in alternative A.

Conclusion. Potential siting of new WTF within cultural landscapes listed or eligible for the National Register under the proposed application process outlined in alternative A would have long-term minor adverse impacts (*no adverse effect* under Section 106) on the park's cultural landscapes. Cumulative impacts would also be long-term, minor, and adverse (*no adverse effect* under Section 106). Impairment to cultural landscapes would not occur for alternative A.

Impacts of Alternative B: Zone Management

Analysis. For alternative B, zone management, the construction of new WTF would be similar to alternative A, potentially creating long-term minor adverse impacts to one or more of the park's National Register listed or eligible cultural landscapes.

As outlined in the impact analysis of historic resources in alternative B above, zone management of the application process places cultural landscapes within the Cultural Resource Zone. Applications for facilities that impact contributing elements of cultural landscapes would not be granted in the Cultural Resource Zone. Requirements that viewshed analyses be undertaken to ensure significant views from and into cultural landscapes are not impacted and that the newest and disguised technologies be utilized to limit visual impacts to cultural landscapes would greatly limit potential impacts to cultural landscapes in the park from the establishment of new WTF.

Similar to alternative A, areas of overlay between the Cultural Resources Zone and other zones may result in the installation of new WTF within cultural landscapes. However, establishing zones with established permit terms and conditions that require specific technology or types of WTF would provide further protection to cultural landscapes that are not provided in alternative A. Generally, the permit terms and conditions include the use of technologies that disguise the appearance of WTF that would restrict visual

impacts and require the concealment of associated equipment cabinets and the co-location of sites on existing infrastructure that can provide the desired coverage. Implementation of these permit terms and conditions would greatly limit the intensity of impacts to cultural landscapes for alternative B and would be unlikely to result in direct impacts to any cultural landscape's character-defining features. Installation of the new facilities, however, would introduce new elements into a cultural landscape's spatial organization, land patterns, topography, vegetation, and circulation patterns. As a result, impacts to the park's cultural landscapes resulting from alternative B would be long-term, minor, and adverse. Potential impacts to viewsheds would be further evaluated during the NEPA process for each individual facility through methods such as balloon tests, visual simulations, and other methods for analyzing viewsheds. Under Section 106, the WTF application process outlined in alternative B, would have *no adverse effect* on cultural landscapes.

Cumulative Impacts. Actions that contribute to cumulative impacts for alternative B would be the same as those in alternative A. As described in alternative A, impacts from past, present, and future projects planned for Rock Creek Park and adjacent areas range from moderate to major beneficial long-term impacts to negligible impacts to minor long-term adverse impacts.

The impacts on the park's cultural landscapes resulting from these actions, in combination with the long-term minor adverse impacts of siting new WTF utilizing zone management as outlined in alternative B, would continue to result in long-term minor adverse cumulative impacts (*no adverse effect* under Section 106) because these projects do not lessen or increase the potential impacts of construction and installation new WTF within the park's cultural landscapes as outlined in alternative B.

Conclusion. The potential siting of new WTF within cultural landscapes listed or eligible for the National Register under the proposed application process outlined in alternative B would have long-term minor adverse impacts (*no adverse effect* under Section 106) on the park's cultural landscapes, with the established permit terms and conditions in each zone lessening these impacts. Cumulative impacts would also be long-term, minor, and adverse (*no adverse effect* under Section 106). Impairment to cultural landscapes would not occur for alternative B.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. Impacts for alternative C would be long-term and likely range from negligible to minor adverse to the park's cultural landscapes. In alternative C, applications for construction of new WTF would be encouraged in those areas of known coverage gaps, primarily along Beach Drive, a contributing element of the Rock Creek Park cultural landscape's circulation patterns. In the area of known coverage gaps, specific permit terms and conditions would be applied to all applications that address the physical appearance of proposed WTF, including height, width, and concealment requirements. WTF siting outside existing coverage gaps would be evaluated as well, and evaluated using the zone management structure described in alternative B. As with alternative B, WTF in areas outside coverage gaps would be required to incorporate specific permit terms and conditions specific to that zone, such as the use of technology concealing the WTF and specific size and height limitations. The permit terms and conditions in all areas of Rock Creek park would ensure that the facilities blend in with the natural and cultural environment of the roadway's cultural landscape.

While implementation of the permit's terms and conditions would effectively mask most of the facility's physical characteristics, the facility would still introduce a new element into the cultural landscape, primarily due to the presence of associated equipment cabinets along the roadway corridor. If only one facility were sited along Beach Drive or in another existing coverage gap area, the facility would likely be

barely noticed by passing motorists and pedestrians in the park and would thus have a negligible impact on the cultural landscape. Multiple new facilities sited along Beach Drive or in another area would increase park users' awareness of the facilities, despite the use of stealth technology and implementation of the permit's other conditions. Compliance with NEPA, Section 106, and other applicable laws and policies as part of the application process would ensure that physical impacts to character-defining features of the cultural landscape do not occur, thus resulting in minor long-term adverse impacts to the park's cultural landscape if multiple facilities were sited along Beach Drive or elsewhere. Potential impacts to viewsheds would be further evaluated during the NEPA process for each individual facility through methods such as balloon tests, visual simulations, and other methods for analyzing viewsheds. In terms of Section 106, this alternative would have *no adverse effect* on historic resources.

Cumulative Impacts. As described in alternative A, impacts from past, present, and future projects planned for Rock Creek Park and adjacent areas would be long-term and range from moderate to major beneficial to negligible impacts to minor long-term adverse impacts.

Impacts on the park's cultural landscapes resulting from these cumulative actions, in combination with the negligible to moderate long-term adverse impacts of siting WTF along Beach Drive or in other existing coverage gap areas, would continue to result in long-term negligible to minor adverse cumulative impacts (*no adverse effect* under Section 106) because these projects do not lessen or increase the potential impacts of construction and installation of new WTF along Beach Drive as outlined in alternative C.

Conclusion. Siting one or more WTF along Beach Drive, where siting would be encouraged, or in other existing coverage gap areas would be subject to specific permit terms and conditions that would utilize the newest and disguised technology, as well as permit conditions regarding size and height of the facilities, would have long-term negligible to minor adverse impacts (*no adverse effect* under Section 106) on the park's cultural landscapes for alternative C. The permit terms and conditions specific to areas with coverage gaps would provide further protection for cultural landscapes in those areas. Cumulative impacts from the combination of these impacts with those from past, present, and future actions would remain long-term negligible to minor adverse impacts (*no adverse effect* under Section 106). Impairment to cultural landscapes would not occur for alternative C.

ARCHEOLOGICAL RESOURCES

Archeological resources consist of buried prehistoric and historic remains and artifacts significant to our study of prehistory and history. As these resources exist primarily in subsurface contexts, potential impacts to archeological resources are assessed according to the extent to which the proposed alternatives would involve ground-disturbing activities such as excavation or grading. Analysis of possible impacts to archeological resources was based on a review of previous archeological studies, consideration of the proposed alternatives, and other information provided by the NPS. The analysis of potential impacts to archeological resources begins with the identification and evaluation of archeological sites in the study area. Information concerning site location, type, age and National Register eligibility provides an essential understanding of not only known sites, but, based on certain environmental factors, such as proximity to water and slope of ground, where potential undocumented archeological resources sites may be found. National Register listed and eligible archeological sites are then assessed for potential impacts from the proposed alternatives. Construction of the WTF could possibly impact the physical character of any of the identified archeological resources.

Study Area

The study area for the evaluation of potential impacts to archeological resources encompasses the following resources:

- Rock Creek Park
- Rock Creek and Potomac Parkway
- Whitehaven Parkway
- Glover-Archbold Park
- Six traffic circles
- Triangle parks

Archeological resources associated with prehistoric quarry sites and base camps have been recorded in the park. Extant historic-period structures and primary documentation suggest that the park also contains agricultural-, industrial- and military-related archeological resources extending from the eighteenth-through mid-twentieth-century. Similar types of resources are recorded and can be anticipated in the Rock Creek and Potomac Parkway, Whitehaven Park, and Glover-Archbold Park. No archeological resources, or studies, have been conducted in the six traffic circles and the Triangle parks.

Impact Thresholds

For purposes of analyzing potential impacts to archaeological resources, the thresholds of change for the intensity of an impact are defined as follows:

Negligible: The impact on archeological sites is at the lowest level of detection, barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: The impact on archeological sites is measurable or perceptible, but it is slight and localized within a relatively small area of a site or group of sites. The impact does not affect the character-defining features of a listed or eligible National Register archeological site and would not have a permanent effect on the integrity of any archeological sites. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: The impact is measurable and perceptible. The impact changes one or more character- defining feature(s) of an archeological resource but does not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: The impact on archeological sites is substantial, noticeable, and permanent. The impact is severe or is of exceptional benefit. For National Register-eligible or listed archeological sites, the impact changes one or more character-defining features(s) of an archeological resource, diminishing the integrity of the resource to the extent that it is no longer eligible for listing in the National Register. For purposes of Section 106, the determination of effect would be *adverse effect*. A major impact can also be one of exceptional benefit. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Rock Creek Park; (2) key to the natural or cultural integrity of the park; or (3) identified as a goal in the park's general management plan or other relevant NPS planning documents.

Duration: All impacts to archeological resources are considered long-term.

Impacts of Alternative A: No-Action Alternative

Analysis. In the no-action alternative, right-of-way permits for WTF would not be granted in certain areas of the park where such facilities would conflict with the park's mission or planned land uses, such as the uses detailed in the park's GMP. Applications evaluated by the NPS would require compliance documentation through the NEPA and NHPA, possibly including an archeological survey. The location and impact limits of the proposed facility site would dictate whether an archeological survey was warranted. For example, areas of previously disturbed ground, such as adjacent to a roadway, would likely contain low potential for intact archeological deposits due to road construction activities. Conversely, the yard areas of historic farmsteads would contain high potential for undisturbed archeological deposits associated with the occupation of the property, including wells, privies, and other subsurface features. An example of an area exhibiting high potential for undisturbed Native American deposits would include quartzite outcroppings in steep-walled portions of the park.

Alternative A would likely have a long-term negligible impact on most of the park's archeological resources due to the alternative's protection of areas of known archeological sensitivity and the requirements to comply with all applicable authorities, such as NEPA, during the application process. Shovel test pits and test unit excavations associated with the identification and evaluation of potential National Register listed archeological sites, as required for Section 106 compliance, would result in minor to moderate adverse impacts to archeological resources. In terms of Section 106, alternative A would have *no adverse effect* on National Register listed or eligible archeological resources.

Cumulative Impacts. Past, present and future projects within or adjacent to the Rock Creek Park units have the potential to impact archeological resources. Many of these projects, such as the development of the GMP, the development of cultural landscape reports for various park units, the preparation of parkwide archeological surveys, and the rehabilitation of Peirce Mill and the Klinge Mansion stonework, would protect and rehabilitate park resources and would therefore be considered moderate to major beneficial impacts to archeological resources. Other projects such as the District Department of Transportation's Klinge Road and Capital improvement programs and corridor studies, and the proposed subdivision and development of the Tregaron Estates would have negligible impacts on the park's archeological resources as these projects are proposed for areas outside of the park. Construction of a new

Park Police facility at area H-3 as part of the proposed moving of the D-3 Park Police facility would potentially have a minor to moderate adverse impact on archeological resources due to testing for potential archeological resources prior to construction.

The impacts on the park's archeological resources resulting from these past, present and future actions, in combination with the minor to moderate adverse impacts of the current WTF application process, would continue to result in long-term minor to moderate adverse cumulative impacts (*no adverse effect* under Section 106) because these projects do not lessen or increase the potential impacts of construction and installation of new WTF within the park as outlined in alternative A.

Conclusion. In alternative A, limiting the placement of WTF pursuant to the applicable authorities would result in long-term negligible impact on archeological resources of the park as the resources in the zones and areas would be protected. In areas where WTF would potentially be sited, applicants would be required to comply with NEPA and Section 106, which would include testing to identify and evaluate the eligibility of potential site pursuant to Section 106. Due to the excavations associated with the identification and evaluation of potential National Register-eligible archeological sites within proposed new WTF sites, including antenna support structures, alternative A would potentially have long-term minor to moderate impacts (*no adverse effect* under Section 106) on archeological resources. Cumulative impacts would be long-term minor to moderate adverse (*no adverse effect* under Section 106). Impairment to archeological resources would not occur for alternative A.

Impacts of Alternative B: Zone Management

Analysis. Construction of new WTF in this alternative would be similar to alternative A and would likely have a long-term negligible impact on most of the park's archeological resources due to the alternative's protection of areas of known archeological sensitivity. Specific permit terms and conditions required for each zone or area for alternative B would provide additional protection to resources by potentially reducing the footprint of the WTF. Excavations associated with the identification and evaluation of potential National Register listed archeological sites, as required for Section 106 compliance, would result in minor to moderate adverse impacts to archeological resources. In terms of Section 106, alternative B would have *no adverse effect* on National Register listed or eligible archeological resources.

Cumulative Impacts. Cumulative actions and impacts related to past, present, and future actions in the units of Rock Creek Park that could affect archeological resources are the same as described in alternative A. As these projects would be unlikely to increase or decrease impacts to archeological resources within the park as part of the WTF plan/EA, cumulative impacts would remain long-term minor to moderate adverse due to disturbance caused by testing. In terms of Section 106, there would be *no adverse cumulative effects* resulting from alternative B.

Conclusion. Management zones or areas that provide specific permit terms and conditions would result in long-term negligible impact on archeological resources of the park as the resources in the zones and areas would be protected, with minor to moderate adverse impacts occurring from necessary excavations. Alternative B would potentially have long-term minor to moderate adverse impacts (*no adverse effect* under Section 106) to archeological resources due to these ground disturbances. Cumulative impacts would also be long-term minor to moderate adverse (*no adverse effect*). Impairment to archeological resources would not occur for alternative B.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, applicants would be encouraged to site in areas of known coverage gaps, primarily along Beach Drive and the secondary roads connecting to it. Alternative C also provides for applicants to site proposed WTF in areas and zones beyond the recognized coverage gap under the zone management structured described in alternative B. One documented archeological resource, the Peirce Mill site, is situated along the west side of Beach Drive just north of Park Road. Portions of the Rock Creek floodplain on the east side of Beach Drive have yielded cultural refuse associated with short-term prehistoric campsites (Inashima 1985). Archeological investigations in this area identified extensive flood deposits and artificial infilling of the terrain, but the potential exists for intact prehistoric deposits to be present below the alluvium and fill.

Excavations associated with the identification and evaluation of potential National Register listed archeological sites along Beach Drive and its connecting secondary roads would have a negligible to moderate adverse impact (*no adverse effect* in terms of Section 106) on archeological resources associated with prehistoric and historic period activities. Proposed WTF sites beyond the Beach Drive area would likely have a long-term negligible impact on archeological resources due to the zone management protection of areas of known archeological sensitivity. Excavations associated with the identification and evaluation of potential National Register listed archeological sites, as required for Section 106 compliance, would result in minor to moderate adverse impacts (*no adverse effect* in terms of Section 106) to archeological resources.

Cumulative Impacts. Action and impacts related to past, present, and future actions in the units of Rock Creek Park that could affect archeological resources are the same as described in alternative A. Cumulative impacts would remain long-term negligible to moderate adverse impacts (*no adverse effect* under Section 106) since these projects would neither increase nor decrease impacts to archeological resources for alternative C.

Conclusion. Impacts to the archeological resources in the units of Rock Creek Park resulting from alternative C would be long-term and range from negligible to moderate adverse impacts (*no adverse effect* under Section 106). Cumulative impacts would also be long-term and range from negligible to moderate (*no adverse effect* under Section 106). Impairment to archaeological resources would not occur for alternative C.

SOCIAL RESOURCES

VISITOR USE AND EXPERIENCE

Guiding Regulations and Policies

The NPS *Management Policies 2006* state that enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks and that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks (Section 1.4.3).

The NPS feels that the key to enjoyment of parks and the appreciation and inspiration derived from the resources is based on allowing appropriate use of parks. An appropriate use is one that is suitable, proper, or fitting for a particular park, or to a particular location within a park. Not all uses are appropriate or allowable in units of the national park system, and what is appropriate may vary from one park unit to another (Section 1.5).

Because many forms of recreation do not require a national park setting, the NPS will (Section 8.2):

- Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks; and
- Defer to local, state, and other federal agencies; private industry; and non-governmental organizations to meet the broader spectrum of recreational needs and demands.

Unless mandated by statute, the NPS will not allow visitors to conduct activities that would create unacceptable impacts and that, individually or cumulatively (Section 8.2):

- Be inconsistent with a park's purpose or values; or
- Impede the attainment of a park's desired conditions for natural and cultural resources as identified through the park's planning process; or
- Create an unsafe or unhealthful environment for other visitors or employees; or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values; or
- Unreasonably interfere with:
 - Park programs or activities, or
 - An appropriate use, or
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park, or
 - NPS concessioner or contractor operations or services.

Methodology and Assumptions

The purpose of this impact analysis is to determine if, through the evaluation of applications, if the placement of WTF in the park is compatible or in conflict with the purpose of the park, its visitor experience goals, and the direction provided by the NPS Management Policies. Thus, these policies and goals were integrated into the impact thresholds.

To determine impacts, the current and past uses of area were considered and the potential effects of facility placement in all Rock Creek Park units on visitor experience analyzed. Other recreational activities and the type of visitor experiences that occur in other areas of the park that might be affected by the placement of WTF were also considered in the impacts analysis. This analysis is qualitative as the exact location of potential future WTF is not known.

Study Area

The study area when considering impacts to visitor use and experience is all administrative units of Rock Creek Park.

Impact Thresholds

The following thresholds for evaluating impacts on visitor experience were defined:

- Negligible:** Visitors would likely be unaware of impacts associated with construction, operation, and maintenance of WTF. There would be no noticeable change in visitor use and experience or in any defined indicators of visitor satisfaction or behavior.
- Minor:** Changes in visitor use and/or experience would be slight and detectable, but would not appreciably limit or enhance any critical characteristics of the visitor experience. Visitor satisfaction would remain stable.
- Moderate:** A few critical characteristics of the existing visitor experience would change, and the number of visitors engaging in a specified activity would be altered. Some visitors participating in that activity or visitor experience might be required to pursue their choices in other available local or regional areas. Visitor satisfaction at the park would begin to either decline or increase.
- Major:** A number of critical characteristics of the existing visitor experience would change and/or the number of participants engaging in an activity would be greatly reduced or increased. Large numbers of visitors overall who desire to continue using and enjoying that activity or visitor experience would be required to pursue their choices in other available local or regional areas. Overall visitor satisfaction would markedly decline or increase.

Duration:

Short-term impacts would last during facility construction, typically one to three months.

Long-term impacts would occur throughout the life of the facility, taking into consideration operation and maintenance of the facility.

Impacts of Alternative A: No-Action Alternative

Analysis. In the no-action alternative, right-of-way permits for WTF would be evaluated for sites throughout the park in accordance with the process set forth in RM-53, which includes compliance with NEPA and evaluation for how the proposed application would or would not be consistent with the planned uses in the park's GMP and other management documents. Based on these documents and the stated planned uses, applications for facilities would not be granted in the Forest Zone, Park Road Zone, Fort Circle Parks, Dumbarton Oaks, and Montrose Park, areas of Rock Creek Park.

In all other areas of Rock Creek Park, WTF sited in areas of the park with high visitation could result in interruptions to visitor use and experience could occur. Although each facility size and height would vary depending on its location and the available technology, a typical antenna support structure and associated equipment cabinet may take up an area of 30 by 30 feet. These facilities would produce noise from emergency generators and cooling fans that may have an impact on visitor use and experience in the immediate areas of the facility.

In areas where these facilities are approved and located, potential impacts to visitor use would include the visual presence of the facility that could detract from the visitor experience, as well as the potential of the facility to limit access to certain visitor use areas. The ability of visitors to see these facilities while visiting the various units of Rock Creek Park would be expected to have long-term minor adverse impacts as visitors would likely be aware of the facility, but would not limit visitor use of the area.

Placement of facilities throughout the park without any predetermined permit terms and conditions could impact certain recreational pursuits. As found in the 2003 *Rock Creek Park Telecommunications Facilities Environmental Assessment* (NPS 2003c), use of the maintenance yard area at the park by birders was impacted by the current WTF in that area. The 2003 EA found that this user group experienced long-term moderate adverse impacts. Bird watching is a popular and well established activity in Rock Creek Park and in the area encompassing the maintenance yard. Rock Creek Park provides a large expanse of open space in the highly urbanized Washington, DC area, and provides habitat for migrant, breeding, resident and wintering birds. Bird watchers use the maintenance yard area and other areas of the park as an easily accessible location to enjoy spring and fall migration, particularly the movement of neotropical migrants. The breeding bird census area (see figure 10 in chapter 3), an approximately 65-acre area between Glover Road, Military Road, and Ross Drive, has been recognized since 1959. Large numbers of birders use these areas of the park on an annual basis especially during the spring and autumn migration seasons. In addition, wintering and resident species are surveyed annually during the Washington, D.C. National Audubon Christmas Bird Count. Park birders and volunteers count all species and individuals of birds encountered in a 15-mile diameter circle on one day. A part of the Washington, D.C. circle is located in Rock Creek Park and includes the Nature Center and Carter Barron Amphitheater. The Montgomery County chapter of the Maryland Ornithological Society and the Audubon Society of the Middle Atlantic States also organize several field trips on an annual basis to the area of the park encompassing the maintenance yard facility, and International Migratory Bird Day is celebrated in the area each year.

WTF that extend above the height of the forest canopy make these facilities visible from other locations in the park and could interfere with the ability of bird watchers, as well as anyone else recreating in the park, to fully enjoy park resources in the area. In addition, noise generated by cooling fans and emergency generators on the equipment building associated with these facilities could disturb bird species that would normally utilize edge habitat in the area causing them to avoid the site; thus, detracting from the value of the area as a bird watching location (NPS 2003c). There would be long-term minor adverse impacts on bird watching visitors.

These impacts would also be expected to occur to those park visitors who come to Rock Creek Park to see wildlife. Other recreational uses that could be impacted by the presence of WTF in the park include hiking, horse back riding, recreational sports, use of the amphitheater, and commuting through the park roads. Many of these activities, such as commuting through park roads, would experience long-term negligible adverse impacts from the presence of WTF as their presence or noise would not impede their recreational activity. For those activities that focus on the solitude of Rock Creek Park units, impacts would be long-term moderate adverse as the noise from these facilities could create a noticeable impact to visitor use that causes a change in visitor satisfaction.

Cumulative Impacts. In the no-action alternative, past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts would include various visitor facility rehabilitation projects (i.e., the replacement of the Nature Center roof, trail maintenance, Klinge Mansion stonework, and the Peirce Mill rehabilitation). These projects have, and would continue to, improve visitor facilities and enhance the visitor experience creating long-term beneficial impacts.

Other cumulative projects that would influence visitor use are related to construction and development projects outside the park such as various DDOT road improvement projects (including the Klinge Road project), development of the Georgetown Waterfront park, relocation of the U.S. Park Police D-3 Facility, and the development of Tregaron Estates. The majority of these projects, excluding development of Tregaron Estates and Klinge Road, would enhance the visitor experience. Improvement of D.C. managed roadways would facilitate improvements to visitor access to the park, while the relocation of the U.S. Park Police would make the current facility available for additional visitor use opportunities. Once

completed, the Georgetown Waterfront park would also provide additional areas for both passive and more active forms of visitor use within Rock Creek Park. These projects would all further contribute to long-term beneficial impacts. The development of the Tregaron Estates and the potential reopening of Klinge Road could remove areas currently used to recreate by local area residents, turning them into housing and a roadway, respectively. Although these opportunities would be lost, other similar opportunities would exist in the area, resulting in long-term minor adverse impacts. Recreational opportunities that have traditionally occurred at Rock Creek Park, such as tennis tournaments and activities at Carter Barron Amphitheater, would continue to occur and provide beneficial impacts.

The impacts on visitor use and experience in Rock Creek Park units resulting from these past, present and future actions, in combination with the long-term beneficial and minor adverse impacts for the no-action alternative, would result in long-term minor adverse cumulative impacts to visitor use and experience.

Conclusion. In the no-action alternative, there would be long-term negligible to moderate adverse impacts as various user groups are impacted differently from the noise, visual, and physical presence of WTF in various units of Rock Creek Park. In general, those visitors seeking solitude would be impacted moderately, while those engaging in activities such as commuting or pleasure driving would be impacted negligibly. Cumulative impacts for the no-action alternative would be long-term, minor, and adverse.

Impacts of Alternative B: Zone Management

Analysis. In alternative B, the presence of WTF in Rock Creek Park units would affect various user groups as described in alternative A. However, for alternative B, all applications for WTF siting would be evaluated based on the zone or area where the applicant wishes to site. Each zone or area would have specific permit terms and conditions that would apply to any WTF approved for siting. These zones and areas (Valley Floor Automobile Access Zone, Rock Creek and Potomac Parkway Zone, Visitor Facility Zone, Urban Recreation Zone, Whitehaven Parkway, Glover-Archbold Park, the tennis center, and traffic circles and other small parcels) are traditionally areas of more intensive visitor use such as sport fields, established visitor facilities such as the Nature Center, sport tournaments, neighborhood use and commuter traffic. In these areas, the presence and noise of potential WTF would be noticed by visitors as described in alternative A, but would be unlikely to change their level of visitor satisfaction, resulting in long-term minor adverse impacts to visitor use. In some areas in the Cultural Resource Zone and the Administration and Operations Zone (mainly the maintenance yard), these impacts would be greater as recreation in these areas tends to be more passive, and could reach the level of moderate long-term adverse impacts as visitors may be dissatisfied with their park experience. Further, the permit terms and conditions in these zones and areas would address the physical aspects of a facility (height, width, and appearance), which would likely result in less intrusive facilities that would have less of an impact on the visitor experience.

Cumulative Impacts. In alternative B, past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts would be the same as those described in the no-action alternative. These impacts would be the result of various visitor facility rehabilitation projects, development projects, and continued visitor use opportunities that improve the visitor experience and result in long-term beneficial impacts, as well as some development projects that could limit recreational access in the area and result in long-term minor adverse impacts.

The impacts on visitor use and experience in Rock Creek Park units resulting from these past, present and future actions, in combination with the long-term minor to moderate adverse impacts for alternative B, would result in long-term minor adverse impacts to visitor use and experience.

Conclusion. In alternative B, impacts to visitor use and experience would mainly be long-term minor adverse as WTF would be subject to specific permit terms and conditions that would likely result in WTF that are less intrusive on the visitor experience. These impacts would increase to long-term moderate adverse in low intensity visitor use areas where WTF would be more intrusive on the visitor experience.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, the presence of WTF in Rock Creek Park would affect various user groups as described in alternative A. However, for alternative C, applicants would be encouraged to site WTF in areas of the park where they would serve known coverage gaps, which occur along Beach Drive (Cityscapes Consulting 2007). The area of Beach Drive serves mainly those visitors in automobiles, typically commuting through the park on a daily basis. Part of the experience during this commute is the visual surroundings experienced by the driver. This alternative provides for the use of concealed equipment on any proposed antenna support structure and associated equipment cabinets. Using concealed technology, the majority of visitors accessing the park along Beach Drive may not notice the addition of WTF in this area. This is in part dependent on the number of facilities proposed and the design of the facilities. For example, visitors would be less likely to notice the addition of a few facilities that are spaced apart similar to and are similar in appearance to the historic light poles along Beach Drive. If facilities were to deviate from this design or be spaced close together, they would be more noticeable. Further, alternative C would apply specific permit terms and conditions that address the height, width, and appearance of potential WTF, as well as limitations on the amount of Forest Zone area that could be disturbed. These additional permit terms and conditions would contribute to WTF in this area being less intrusive on the visitor experience. As described in Soundscapes, because of the ambient noise level in this area from traffic, visitors are unlikely to be impacted by construction, cooling fan, or emergency generator noise when compared to the fairly constant noise of traffic in this area. Because these impacts would be noticeable, but would not be expected to change visitor satisfaction, they would be long-term, negligible, and adverse.

In alternative C applications for facilities in other units of Rock Creek Park would be evaluated based on the zone management described in alternative B. In these areas, impacts would be mainly long-term minor adverse at WTF in higher intensity use areas and long-term moderate adverse in lower intensity use areas, as described in alternative B.

Cumulative Impacts. In alternative C, past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts would be the same as those described in the no-action alternative. These impacts would be the result of various visitor facility rehabilitation projects, development projects, and continued visitor use opportunities that improve the visitor experience and result in long-term beneficial impacts, as well as some development projects that could limit recreational access in the area and result in long-term minor adverse impacts.

The impacts on visitor use and experience in Rock Creek Park units resulting from these past, present and future actions, in combination with the long-term negligible adverse impacts for alternative C, would result in long-term negligible adverse impacts to visitor use and experience.

Conclusion. In alternative C, encouraging applicants to site WTF where coverage gaps exist along Beach Drive would be expected to have long-term negligible impact to visitor use and experience as this area hosts mostly high intensity visitor uses including commuting and pleasure driving. These types of uses would not be expected to be impacted as much by the visual presence or the noise associated with WTF a more passive uses, such as hiking. These uses may also benefit from having cellular coverage. In all other

units of Rock Creek Park, impacts would mainly be long-term minor adverse in higher intensity use areas as WTF would be subject to specific permit terms and conditions that would likely result in WTF that are less intrusive on the visitor experience. These impacts would increase to long-term moderate adverse in low intensity visitor use areas where WTF would be more intrusive on the visitor experience. Cumulative impacts for alternative C would be long-term, negligible, and adverse.

SOCIOECONOMIC RESOURCES

Guiding Regulations and Policies

NEPA requires that economic and social impacts be analyzed when they are interrelated with natural or physical impacts. Economic impacts would potentially result from actions considered under the alternatives; therefore, they are addressed in this document.

Land uses on Rock Creek Park property are in part influenced by Section 5 of the National Capital Planning Act of 1952 (Title 40, USC § 71). This Act provides the legal authority that enables the NCPC to review the siting of WTF on federal property to minimize the visual impacts of such facilities and to protect the health and welfare of the public from potential adverse biological effects resulting from radiofrequency radiation from transmitting antennas.

Issues related to socioeconomics for communities around parks are influenced by the NPS *Management Policies 2006* direction related to public participation. This section of the management policies states that public participation in planning and decision-making will ensure that the NPS fully understands and considers the public's interest in the parks, which are part of the public's community surroundings. Section 2.1.3 of these policies directs the NPS to seek out and consult with, "existing and potential visitors, neighbors, American Indians, other people with traditional cultural ties to park lands, scientists and scholars, concessioners, cooperating associations, gateway communities, other partners, and government agencies." These policies call for the NPS to work cooperatively with others to improve the conditions of the parks, enhance public service, and integrate parks into sustainable ecological, cultural, and socioeconomic systems.

Methodology and Assumptions

The analysis of socioeconomics assumed that the operation and maintenance of WTF in the park has the potential to impact the following socioeconomic resources: property values and public finance. The presence of WTF in a residential neighborhood has a perceived potential to affect property values. Public finance would be impacted by the operation of the facilities due to the leasing costs/rent associated with the sites.

The impacts related to wireless WTF could be related to those of other utility projects, such as transmission lines and power lines. In general studies have cited that these structures are all considered nuisances by those looking to oppose their construction and that these nuisance features, or sources of stigma, typically reduce the market value of a property (Mundy 1992; Patchin 1991). It is the perceived undesirability of a source of stigma that leads to reduction in property value. Whether the source of the risk is quantitative or subjective, the effect on property values may be the same based on this research.

The issue of the impact of wireless WTF on property values has been addressed in the courts. In *Komis v. City of Santa Fe*, the Supreme Court of New Mexico awarded damages for the perceived decline in property value resulting from the source of stigma (presence of the WTF), even when no objective evidence demonstrated that the perceived nuisance was unsafe, and when alleged market loss was not

proven by comparable sales data. This decision developed the “fear in the marketplace” theory of damages, by allowing fear in the marketplace regarding perceived impacts of wireless WTF, rather than actual scientific evidence of adverse health effects from electromagnetic frequencies (EMF), to affect appraised evaluation (McDonough 2003).

In addition to being addressed in the court, real estate literature states that the view enjoyed from a property may affect its value—a poor view, such as that of utility poles, and high-tension wires, detracts from value. Wireless WTF that rise above building height in typical single-family neighborhoods could be visible for some distance (McDonough 2003). Unless they are camouflaged, these structures typically do not complement rural or suburban landscapes.

Perceived declines in property value are also related to concerns with human health and safety. Guidelines regarding safe levels of exposure for both power lines and wireless antennae have been issued, but there is ongoing controversy within the scientific community about whether these government guidelines are strict enough. Despite research showing that emissions from WTF are not a concern, many people are fearful about living in proximity these types of structures. The fear in the marketplace argument established by the Komis decision regarding EMF has also invoked health concerns about cell towers (Rikon 1996).

Numerous lawsuits have been filed regarding the actual or proposed construction of wireless towers. In *Franklin v. Nextel*, the court found that a 120-foot wireless tower erected in a residential neighborhood was so damaging to the neighborhood that it must be dismantled. In Jacksonville, Florida, in 1996, community opposition to a 150-foot tower in a residential neighborhood led the wireless company, InterCel, to take it down (Appeals Ct. Mass, March 2000).

In other cases, courts have ruled for the wireless companies, finding that community opposition was not sufficient grounds for denying a permit for tower construction. For instance, in *Westinghouse v. Hampton*, the court found that the Telecommunications Act pre-empts tower regulation based on perceived health concerns and that “aesthetics alone... (are not)... an adequate reason to deny... use of... property” (Pa. Commw. 1996).

These cases highlight the perceived concern that due to aesthetics and health risks, the presence of wireless WTF decreases property values.

To assess the level of impacts to local social and economic indicators resulting from a given alternative, the following methods and assumptions were used:

1. U.S. Census data for 2000 and projections were used to assess the current and future population growth in the study area. Updated population numbers and property values from the D.C. Office of Planning were used to provide more recent data in addition to the Census data.
2. The two existing WTF in Rock Creek Park were considered to be representative facilities and were used to determine if changes in socioeconomic indicators has occurred.
3. No new commercial or private businesses would operate on Rock Creek property as prohibited by NPS, therefore, existing and potential new WTF would not have a direct effect on promoting economic development within the park boundaries.
4. It was estimated that 9,000 commuters use Beach Drive daily; however, not all commuters were assumed to have cellular phones, nor subscribe to Verizon Wireless cellular service.

5. Applications for new WTF inside the park would be subject to NEPA analysis, and socioeconomic issues for the specific site related to the surrounding area would be evaluated.

Study Area

The study area for socioeconomics is all administered units of Rock Creek Park and adjacent communities.

Impact Thresholds

Four potential category impact levels were defined for the purposes of the economic analysis:

- Negligible:** The impact to socioeconomics, mainly property values and public finance, would not be measurable or perceptible.
 - Minor:** The impact to socioeconomics (property values and public finance) would be measurable or perceptible, but would be limited to a relatively small change in socioeconomic factors.
 - Moderate:** The impact to socioeconomics (property values and public finance) would be sufficient to cause a markedly noticeable change in socioeconomic factors.
 - Major:** The impact to socioeconomic factors (property values and public finance) would be substantial. Normal fluctuations in socioeconomic factors would be expected to substantially change in the short- and long-term.
- Duration:**
- Short-term* impacts would last during facility construction, typically 1 to 3 months.
 - Long-term* impacts would occur throughout the life of the facility, taking into consideration operation and maintenance of the facility.

Impacts of Alternative A: No-Action Alternative

Analysis. Analysis of socioeconomics considered impacts to housing property values and public finance. As applications are considered by the park under RM-53, these issues would also need to be addressed for each specific potential site through the required NEPA analysis to assist in the identification of potential impacts on a site specific basis.

The consideration of potential future WTF in the no-action alternative would take into consideration the perceived impact on property values. As detailed in the “Affected Environment” chapter, although some court cases have been won on the grounds of a perceived decline in property values, no actual decline of property values has been documented.

In the specific case of Rock Creek Park, the two existing WTF in the main unit of Rock Creek Park can be examined for representative potential impact to property values. These two facilities were constructed in 2000. The 2003 *Rock Creek Park Telecommunications Facilities EA* found that between 1990 and 2000, housing prices in the study area around the two existing facilities rose 24.3% and was consistent with the trend of the District as a whole. The 2003 EA then looked at 2002 home value for the four

neighborhoods bordering the study area, two west of the park and two east of the park: Forest Hills/Van Ness, Cleveland Park, Crestwood, and Brightwood. Table 24 illustrates the 2002 values for these neighborhoods compared to the 1990 and 2000 median values from the U.S. Census, as well as what the values in these neighborhoods were in 2006. The range of 2002 values for all four neighborhoods was similar to the 2000 house values and indicates a trend of rising home prices. When compared to more updated values from 2006 and 2007, housing prices in these areas continued to rise. These increases occurred in the context of an overall decline in property values throughout Washington, D.C., as described in the “Affected Environment.” From these data, no decrease in housing values is evident from the existing two WTF located in Rock Creek Park. It would be expected that additional facilities would show the same trend and that impacts to property values in surrounding neighborhoods would be long-term and negligible. It should be noted that the two existing WTF are not located directly adjacent to these areas and for the most part, are not visible from these residences. If a facility were to be sited in an area directly adjacent to and visible from a residential area, long-term minor adverse impacts would be expected.

TABLE 24: REPRESENTATIVE HOUSING VALUES FOR NEIGHBORHOODS IN THE STUDY AREA

Neighborhood	Census Tract	Median House Value 1990	Median House Value 2000	Price Range of Average Home Values 2002*	Price Range of Average Home Values 2006-2007**
Forest Hills/Van Ness	13.01	\$500,001	\$854,100	\$655,000 – \$1,595,000	\$990,000 - \$1,185,000
Cleveland Park	13.02	\$500,001	\$794,300	\$644,500 – \$1,395,000	\$848,000 - \$1,717,500
Brightwood	20.01	\$268,100	\$313,800	\$162,533 – \$695,000	\$389,000 - \$1,580,000
Crestwood	26	\$352,400	\$380,300	\$350,000 – \$735,000	\$552,187 - \$955,000

* 2002 data is based on Multiple Listing Service data for the six-month period ending April 2002 for home sales, not including condominiums

**2002 data is based on Multiple Listing Service data for the various areas. Data for each area were collected for different time periods. Forest Hills data is based on the six-month period ending March 2006; Cleveland Park is based on the 6-month period ending August 2007; Brightwood is based on the 6-month period ending May 2006; and Crestwood is based on the 6-month period ending January 2004. These data were the best available.

Sources: U.S. Census 1990 and 2000; Washington's Best Address 2002 and 2007.

The current WTF, owned by Verizon Wireless, are required to pay an annual permit fee for the sites in Rock Creek Park to the NPS of \$30,000 per site per year, increased 3% annually, pursuant to 36 CFR Part 14.26(a). When the permit was renewed in 2004, the combined fee for both sites was \$69,556, to be increased 3% annually. In 2006, the permit fee for both sites combined was approximately \$73,800 (A. Applewhaite-Coleman, NPS, pers. comm., L. Gillham, NPS, Oct. 26, 2007).

This money does not go to the NPS, but rather into a general treasury fund. In the no-action alternative, any additional permits for WTF granted in the park would be expected to pay a similar fee, at the current fair market value, which would also go into a general treasury fund. Benefits to public finance in the no-action alternative would be long-term beneficial to the United States government, which receives these funds.

Cumulative Impacts. Actions that would contribute to cumulative socioeconomic impacts for the no-action alternative include those actions that bring people and revenue into the park, such as tennis tournaments and activities at Carter Barron. The presence and activity of people in the park, as well as having these events and amenities located in close proximity to these residences would be expected to have long-term beneficial impacts to property values as well. Development on adjacent lands, such as the

Tregaron Estates development, would also influence socioeconomics in the area. For park revenue generating activities, beneficial impacts would occur to public finance as more funds would be available from these activities to use throughout the park. New developments in the area would also create beneficial impacts as it would be expected that these development would not create a decrease in property values and in fact, may cause an increase.

The impacts on socioeconomics in the area resulting from these past, present and future actions, in combination with the long-term negligible adverse impacts for the no-action alternative, would result in long-term beneficial impacts to socioeconomics in the areas surrounding the park.

Conclusion. In the no-action alternative, impacts to property values would be long-term, negligible, and adverse, with long-term beneficial impacts to public finance. Long-term beneficial cumulative impacts would occur.

Impacts of Alternative B: Zone Management

Analysis. The impacts to housing values and public finance would be identical to the impacts described in the no-action alternative as WTF permit applications would still be evaluated in various areas of Rock Creek Park units. Alternative B would also realize some beneficial impacts to property values by adding specific permit terms and conditions in certain zones and areas throughout the park that would require the facilities to have certain physical characteristics that may address some of the concerns neighboring communities may have. With these concerns addressed and facilities directed away from residential neighborhoods in some areas of the park, additional long-term beneficial impacts may be realized.

Cumulative Impacts. Actions that would contribute to cumulative socioeconomic impacts for alternative B include those actions that bring people and revenue into the park, such as tennis tournaments and activities at Carter Barron. Development on adjacent lands, such as the Tregaron Estates development, would also influence socioeconomics in the area. For park revenue generating activities, beneficial impacts would occur to public finance as more funds would be available from these activities to use throughout the park. New developments in the area would also create beneficial impacts as it would be expected that these development would not create a decrease in property values and in fact, may cause an increase.

The impacts on socioeconomics in the area resulting from these past, present and future actions, in combination with the long-term negligible adverse and long-term beneficial impacts for alternative B, would result in long-term beneficial impacts to socioeconomics in the areas surrounding the park.

Conclusion. In alternative B, impacts to property values would be long-term negligible adverse with potential long-term beneficial impacts occurring from the requirement for concealed facilities and equipment buildings. Long-term term beneficial impacts to public finance would also be expected. Cumulative impacts would be long-term and beneficial.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. The impacts to housing values and public finance would be similar to the impacts described in alternative B, as WTF could still be sited in various areas of the park. This alternative would have further beneficial impacts to property values as WTF would be encouraged to site in those areas with coverage gaps, which would be along Beach Drive. The areas where siting would be encouraged is not as visible from residential areas as from other areas of the park. Alternative C would also apply specific permit terms and conditions requiring facilities to be concealed and providing further beneficial impacts in these areas. With these concerns addressed, additional long-term beneficial impacts may be realized in these areas. In areas where there are not coverage gaps, facilities would be evaluated under the zone management framework outline in alternative B, resulting in long-term negligible adverse impacts.

Cumulative Impacts. Actions that would contribute to cumulative socioeconomic impacts for alternative C include those actions that bring people and revenue into the park, such as tennis tournaments and activities at Carter Barron. Development on adjacent lands, such as the Tregaron Estates development, would also influence socioeconomics in the area. For park revenue generating activities, beneficial impacts would occur to public finance as more funds would be available from these activities to use throughout the park. New developments in the area would also create beneficial impacts as it would be expected that these development would not create a decrease in property values and in fact, may cause an increase.

The impacts on socioeconomics in the area resulting from these past, present and future actions, in combination with the long-term negligible adverse and long-term beneficial impacts for alternative C, would result in long-term beneficial impacts to socioeconomics in the areas surrounding the park.

Conclusion. In alternative C, impacts to property values would be long-term negligible adverse. In areas with coverage gaps where facility siting would be encouraged, there would be potential long-term beneficial impacts occurring from the requirement for concealed facilities and equipment buildings, and the potential for concentration of WTF in areas that are not surrounded by residential properties. Long-term beneficial impacts to public finance would also be expected. Cumulative impacts would be long-term and beneficial.

HUMAN HEALTH AND SAFETY

Guiding Regulations and Policies

The NPS is concerned about the safety of visitors to its parks and will cooperate with proposals to enhance visitor safety as long as those proposals do not result in a derogation of NPS resources or conflict with the current or planned use of NPS property (NPS 2006).

The NPS *Management Policies 2006* state that the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. The policies also state, “While recognizing that there are limitations on its capability to totally eliminate all hazards, the NPS and its concessionaires, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees” (sec. 8.2.5.1). Further, the NPS will strive to protect human life and provide for injury-free visits (sec. 8.2.5).

Methodology and Assumptions

The analysis of human health and safety considered the effects of potential new facilities in the park from radiofrequency emissions, the ability of cellular phone users to reach emergency services, and the potential for automobile accidents related to cellular phone use while driving.

The exposure to radiofrequency emissions from WTF is an issue of concern for this WTF plan/EA. Under 47 CFR Part 1.1310, Part I, Radiofrequency Radiation Exposure Limits, criteria are established to evaluate the environmental impact of human exposure to radiofrequency emissions as specified in Section 1.1307(b), described above. The maximum permissible exposure (MPE) limits stated under this regulation are listed in table 25.

TABLE 25: LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic field strength (A/m)	Power Density (Mw/cm ²)	Average Time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f)	6
30–300	61.4	0.163	1.0	6
300–1500	—	—	f/300	6
1500–100,000	—	—	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f)	30
30–300	27.5	0.073	0.2	30
300–1500	—	—	f/1500	30
1500–100,000	—	—	1.0	30

f = frequency in MHz.

* Plan-wave equivalent power density.

Source: 47 CFR Part 1.1310.

The FCC has established guidelines for evaluating compliance with FCC regulations for human exposure to radiofrequency electromagnetic fields. The guidelines are based on two tiers of exposure limits for controlled (occupational) and uncontrolled (general public) situations. These guidelines are based on MPE limits, which consider electric and magnetic field strength and power density for transmitters operating at frequencies between 0.3 MHz and 100,000 MHz.

The MPE limits are based on exposure limits recommended by the National Council on Radiation Protection and Measurements and, over a wide range of frequencies, the exposure limits developed by the Institute of Electrical and Electronics Engineers, Inc., and adopted by the American National Standards Institute. In mixed or broadband fields where several sources and frequencies are involved, the fraction or percentage of the recommend power limit for power density incurred within each frequency interval

should be determined, and the sum of all contributions should not exceed 1.0 or 100%. Applications for WTF in the park must be in compliance with the above radiofrequency regulations and would be evaluated through the required NEPA process. It was assumed for radiofrequency emissions that all new applicants for WTF in Rock Creek Park units would be required to meet the above safety standards.

The impacts from radiofrequency emissions were determined using data collected on the existing facilities, and the assumption that all applicants would be compliant with applicable FCC regulations.

Impacts to cellular phone users' abilities to connect with emergency services were determined by evaluating where coverage is currently not provided and determining how each of the alternatives would address any coverage needs. Greater coverage is assumed to provide better access to 911 emergency services.

Impacts from automobile accidents involving the use of cellular phones were analyzed qualitatively. Current and historic accident data for the park were analyzed to determine the general location and frequency of accidents on the park road network. These data were then compared to studies concerning automobile accidents involving cellular phone use to determine the potential for these types of accidents within the Rock Creek Park roadway network.

Study Area

The study area for human health and safety would be all Rock Creek Park units where WTF already exist and where applications for new facilities could be sited.

Impact Thresholds

The impact intensities for visitor safety are as follows.

- Negligible:** The impact to visitor or park staff safety would not be measurable or perceptible.
- Minor:** The impact to visitor or park staff safety would be measurable or perceptible, but it would be limited to a relatively small number of visitors at localized areas.
- Moderate:** The impact to visitor or park staff safety would be sufficient to create the potential for additional conflicts in areas that currently do not exhibit noticeable accident trends or to create impacts or improvements to safety that are measurable or perceptible to a large portion of park visitors. Where impacts to visitor safety became moderate, it is assumed that current visitor satisfaction and safety levels would begin to decline and some of the national park's long-term visitor goals would not be achieved.
- Major:** The impact to visitor or park staff safety would be substantial. Accident rates in areas usually limited to low accident potential would be expected to substantially increase in the short- and long-term and impacts to the safety of park visitors would be readily apparent throughout the park.

Duration:

Short-term impacts would last during facility construction, typically 1 to 3 months.

Long-term impacts would occur throughout the life of the facility, taking into consideration operation and maintenance of the facility.

Impacts of Alternative A: No-Action Alternative

Analysis. In the no-action alternative, and in accordance with the processes set out in RM-53 for the evaluation of WTF applications, all applications for new facilities would be evaluated for radiofrequency emissions. All new facilities would need to meet all applicable standards related to radiofrequency emissions in order to be considered within the park and there would be no impacts to visitor or employee safety from radiofrequency emissions.

Consideration of future WTF in the park would allow for more areas of the park to have “in-car” coverage than is currently the case. As seen in figure 8 in chapter 2, areas of the park along Beach Drive in the valley currently lack in-car coverage. As stated in the 2003 *Rock Creek Park Telecommunications Facility EA*, the establishment of the two existing WTF in the park increased the wireless signal in a number of areas of the park, allowing these areas to have a signal strength that meets the industry standard signal strengths necessary to achieve E-911 communications (negative [-] 85 dBm). When these two facilities were established, the concerns of the White House Communications Agency, the U.S. Park Police, and the Fraternal Order of Police by eliminating the “dead zone” and enabling law enforcement officers to communicate and coordinate from within the park using cellular phones were met in part. However, even with these two facilities in place, U.S. Park Police still note that there are areas of Rock Creek Park along Beach Drive that do not have coverage and where dropped calls are a concern for citizens using the area (Lt. Burkes, U.S. Park Police, pers. comm., L. Gutman, The Louis Berger Group, Aug. 23, 2007). It is expected that the addition of future WTF in Rock Creek Park units would further address the few remaining coverage gap areas, although consideration of applications would not be limited to these areas. The park could receive applications for additional facilities for areas that currently have coverage by only one or a few providers. Coverage in these areas would provide long-term beneficial impacts as park visitors, park staff, and U.S. Park Police would have cellular coverage in more areas of the park, increasing the ability to make the necessary contacts during an emergency. Increased coverage would provide further beneficial impacts to the U.S. Park Police as they depend on coverage from Verizon and AT&T to operate the CapWIN system. Currently, coverage for this service is not dependable in valley areas of the main unit of Rock Creek Park, and addressing these gaps would result in long-term beneficial impacts to the U.S. Park Police’s current operations, as well as potential future operations that would rely on this type of technology to operate.

Although the increased ability to use cellular phone within units of Rock Creek Park may provide benefits, it also has the potential to create an increase in accidents as the ability to use these phones would distract drivers. The District of Columbia prohibits driving while using a cell phone unless a hands-free device is used. However, as shown in the Affected Environment, even with a hands-free device, drivers could still be distracted while using a phone and driving.

Historical and current accident data show that the majority of accidents on the park roadway network occurred on Rock Creek and Potomac Parkway and on Beach Drive. These roadways are characterized by numerous turns and direction changes caused by the varied terrain of Rock Creek Park. The numerous directional changes on these roads account for a speed limit of 35 miles per hour on the parkway and 25 miles per hour on Beach Drive. Although some studies have shown that use of a cellular phone can increase the risk of collision up to four times, further research has shown that these numbers may be overstated and that banning cell phones would not result in a statistically significant reduction in accidents (Redelmeier and Tibshirani 1997; Hahn and Prieger 2006). Based on these studies, it would be expected that any increase or change in the ability of drivers to use cellular phones while driving would have long-term negligible adverse impacts on the number of accidents related to cellular phone use while driving.

Cumulative Impacts. Past, current, and reasonably foreseeable future actions that would contribute to cumulative impacts for the no-action alternative include any roadway improvements in the area by the DDOT, conversion of NPS radio systems to digital narrow band technology, and relocation of the U.S. Park Police D-3 facility. Roadway improvements conducted by the DDOT around units of Rock Creek Park would be expected to improve roadway conditions in the long-term, providing beneficial impacts to those traveling the roadways. Activities of the U.S. Park Police would have both beneficial and adverse impacts as the conversion to narrow band radios would enhance U.S. Park Police operations resulting in long-term beneficial impacts. However, while operations would be enhanced, moving the D-3 facility to outside of the main unit of Rock Creek Park could result in longer wait times for those waiting for U.S. Park Police response. Since the U.S. Park Police does not respond to 911 calls and only non-life threatening situations, these delays would be expected to have long-term negligible adverse impacts. Further actions taken into consideration for cumulative impacts include other actions that result in automobile accidents, such as distracted drivers, speeding, etc; as well as the presence of other radiofrequency sources in the areas including radio and television broadcasting facilities. These actions would result in long-term moderate adverse impacts as they would further contribute to accidents and radiofrequency exposure.

The impacts on human health and safety in the park resulting from these past, present and future actions, in combination with the long-term negligible adverse and long-term beneficial impacts for the no-action alternative, would result in long-term beneficial impacts to human health and safety within the park, as well as areas surrounding the park.

Conclusion. In the no-action alternative, impacts to human health and safety would be long-term beneficial from increased coverage and the ability to reach emergency services, and long-term negligible adverse from any change in the number of accidents related to cellular phone use while driving. There would be no impacts from radiofrequency emissions as any new WTF would be required to comply with FCC regulations. Cumulative impacts for the no-action alternative would be long-term and beneficial.

Impacts of Alternative B: Zone Management

Analysis. In alternative B, and in accordance with the processes set out in RM-53 for the evaluation of WTF applications, all applications for new facilities would be evaluated for radiofrequency emissions and would ensure that there would be no impacts to visitor or employee safety from radiofrequency emissions as described in the no-action alternative.

The ability of Rock Creek Park users and staff to use cellular phones to reach emergency services for alternative B would be the same as in the no-action alternative. Additional coverage in the park from potential new WTF would provide the signal strength that meets the industry standard signal strengths necessary to achieve E-911 communications (negative [-] 85 dBm) and address past and current concerns from other government agencies operating within the park. Planning through GMP zones and other park management documents for this alternative would not be prohibitive from addressing the current coverage gaps, and would consider applications for siting outside areas that have coverage gaps if there is a perceived need by the applicant. The provision of coverage in these areas would provide long-term beneficial impacts as park visitors and staff would have cellular coverage in more areas of the park, increasing the ability to make the necessary contacts during an emergency. Further, increased coverage would provide beneficial impacts to the U.S. Park Police as they depend on coverage from Verizon and AT&T to operate the CapWIN system and may also need cellular facilities for future operations.

Although the increased ability to use cellular phone within units of Rock Creek Park may provide benefits, it also has the potential to create an increase in accidents as the ability to use these phones would distract drivers. As described in the no-action alternative, it would be expected that any increase or

change in the ability of drivers to use cellular phones while driving may have long-term negligible adverse impacts on the number of accidents related to cellular phone use while driving.

Cumulative Impacts. Past, current, and reasonably foreseeable future actions that would contribute to cumulative impacts for alternative B would be the same as those in the no-action alternative. Roadway improvements conducted by the District Department of transportation around units of Rock Creek Park would be expected to improve roadway conditions in the long-term, providing beneficial impacts to those traveling the roadways. Activities of the U.S. Park Police would have both beneficial and adverse impacts as the conversion to narrow band radios would enhance U.S. Park Police operations resulting in long-term beneficial impacts. However, while operations would be enhanced, moving the D-3 facility to outside of the main unit of Rock Creek Park could result in longer wait times for those waiting for U.S. Park Police response. Since the U.S. Park Police does not respond to 911 calls and only non-life threatening situations, these delays would be expected to have long-term negligible adverse impacts. The presence of other factors that cause automobile accidents and other radiofrequency emission sources would have long-term minor adverse impacts.

The impacts on human health and safety in the park resulting from these past, present and future actions, in combination with the long-term negligible adverse and long-term beneficial impacts for alternative B, would result in long-term beneficial impacts to human health and safety within the park, as well as areas surrounding the park.

Conclusion. In alternative B, impacts to human health and safety would be long-term beneficial from increased coverage and the ability to reach emergency services, and long-term negligible adverse from any change in the number of accidents related to cellular phone use while driving. There would no impacts from radiofrequency emissions as any new WTF would be required to comply with FCC regulations. Cumulative impacts for alternative B would be long-term and beneficial.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, and in accordance with the processes set out in RM-53 for the evaluation of WTF applications, all applications for new facilities would be evaluated for radiofrequency emissions and would ensure that there would be no impacts to visitor or employee safety from radiofrequency emissions as described in the no-action alternative.

The ability of Rock Creek Park visitors and staff to use cellular phones to reach emergency services for alternative C would be the same as in the no-action alternative, as additional coverage in the park from potential new WTF would provide the signal strength that meets the industry standard signal strengths necessary to achieve E-911 communications (negative [-] 85 dBm) and address past and current concerns from other government agencies operating within the park. This alternative specifically addresses the provision of cellular “in-car” coverage in those areas where gaps currently exist by encouraging applications in these areas, and would be expected to ensure these gaps are addressed. The provision of coverage in these areas would provide long-term beneficial impacts as park visitors and staff would have cellular coverage in more areas of the park, increasing the ability to make the necessary contacts during an emergency. Further, increased coverage would provide beneficial impacts to the U.S. Park Police as they depend on coverage from Verizon and AT&T to operate the CapWIN system and may also need cellular facilities for future operations.

Although the increased ability to use cellular phone within units of Rock Creek Park may provide benefits, it also has the potential to create an increase in accidents as the ability to use these phones would distract drivers. As described in the no-action alternative, it would be expected that any increase or

change in the ability of drivers to use cellular phones while driving would have long-term negligible adverse impacts on the number of accidents related to cellular phone use while driving.

Cumulative Impacts. Past, current, and reasonably foreseeable future actions that would contribute to cumulative impacts for alternative C would be the same as those in the no-action alternative. Roadway improvements conducted by the DDOT around the park would be expected to improve roadway conditions in the long-term, providing beneficial impacts to those traveling the roadways. Activities of the U.S. Park Police would have both beneficial and adverse impacts as the conversion to narrow band radios would enhance U.S. Park Police operations resulting in long-term beneficial impacts. However, while operations would be enhanced, moving the D-3 facility to outside of the main unit of Rock Creek Park could result in longer wait times for those waiting for U.S. Park Police response. Since the U.S. Park Police does not respond to 911 calls and only non-life threatening situations, these delays would be expected to have long-term negligible adverse impacts. The presence of other factors that cause automobile accidents and other radiofrequency emission sources would have long-term minor adverse impacts.

The impacts on human health and safety in the park resulting from these past, present and future actions, in combination with the long-term negligible adverse and long-term beneficial impacts for alternative C, would result in long-term beneficial impacts to human health and safety within the park, as well as areas surrounding the park.

Conclusion. In alternative C, impacts to human health and safety would be long-term beneficial from increased coverage and the ability to reach emergency services, and long-term negligible adverse from any change in the number of accidents related to cellular phone use while driving. There would no impacts from radiofrequency emissions as any new WTF would be required to comply with FCC regulations. Cumulative impacts for alternative C would be long-term and beneficial.

PARK MANAGEMENT AND OPERATIONS

Park management and operations refers to the current staff available to adequately protect and preserve vital park resources and provide for an effective visitor experience. This topic also includes the level of effort necessary to process and manage applications for WTF.

Guiding Regulations and Policies

Direction for management and operations at Rock Creek Park is set forth in the park's enabling legislation, and GMP (2005). Specifically related to the WTF plan/EA, the GMP includes the following specific management objectives that would be applicable in regards to management of special uses (NPS 2005a):

- Park resources or public enjoyment of the park are not denigrated by nonconforming uses.
- Only telecommunication structures that do not jeopardize the park's mission and resources may be permitted within the park.
- No new nonconforming use or rights-of-way are permitted through the park without specific statutory authority and approval by the director of the National Telecommunications Agency.

In addition to this park guidance, the staff time and level of effort for the application process is driven by RM-53. Under a typical application process, RM-53 sets forth time lines for park staff to follow during the application process. These guidelines provide for a 120 day process once the park receives a written application, this does not include any pre application meetings. This 120 process is detailed in figure 7

(chapter 2). In addition to this time line, related to park operations and maintenance RM-53 states that all costs associated with review and approval of the application package, and all cost involved in posting and review of the public announcement and Federal Register notice are the responsibility of the applicant.

Methodology and Assumptions

Park management and operations, for the purpose of this analysis, refers to the quality and effectiveness of park staff to maintain and administer park resources and provide for an effective visitor experience, while at the same time having the resources available to process applications for WTF. This includes a qualitative analysis of park staff responsibilities and level of effort related to the consideration and processing of applications for wireless WTF for each of the alternatives. This analysis assumes that the application process for the two existing facilities was not typical, and the level of effort associated with those two WTF is not representative of future efforts. The impact analysis is based on the current description of park operations presented in the “Affected Environment” chapter of this document.

Study Area

The study area for park management and operations are all Rock Creek Park managed units where applications for wireless WTF could be sited.

Impact Thresholds

The following thresholds for evaluating impacts on park operations and management were defined and applied to beneficial and adverse impacts:

- Negligible:** Park or agency operations would not be impacted or the impact would not have a noticeable or measurable impact on park or agency operations.
- Minor:** Impacts would be noticeable and would result in a measurable, but small, change in park or agency operations. Any required changes in park staffing and funding could be accommodated within normal budget cycles and expected annual funding without appreciably affecting other operations within the park.
- Moderate:** Impacts would be readily apparent and would result in a substantial change in park or agency operations that would be noticeable to staff and the public. Required changes in park staffing and/or funding could not be accommodated within expected annual funding and would measurably affect other operations within the park by shifting staff and funding levels between operational divisions.
- Major:** Impacts would be readily apparent and would result in a substantial change in park operations that would be noticeable to staff and the public and would be markedly different from existing operations. These changes in park staffing and/or funding could not be accommodated by expected annual funding and would require the park to readdress its ability to sustain current park operations.
- Duration:**
 - Short-term* effects would be less than one year and would not impact the next year’s budget cycle.
 - Long-term* effects would continue one year and impact the budget cycle for the next year.

Impacts of Alternative A: No-Action Alternative

Analysis. In the no-action alternative, the park would process applications for WTF based on the guidance provided in RM-53, the GMP and other park management documents, and all other applicable laws and regulations as described in chapter 1. Applicants would be able to submit an application for any area in any Rock Creek Park unit; however, when looking at the mission and planned uses set forth in the park's GMP, there are certain zones where applications would not be approved (see the "Elements Common to All Alternatives" section in chapter 2). Although the park may not approve these applications, park staff would still need to spend time conducting pre-application meetings with applicants, processing applications, etc. Further, with no set plan for processing applications and no pre-determined permit terms and conditions for various areas of the park, applicants would be more likely to have to revise and submit multiple applications for the same project in order to present a plan to the park that does not conflict with the park mission or planned land uses. Without a set plan of where right-of-way permit applications for WTF would be approved and how these applications would be processed, in the context of existing guidance, more confusion would be created for the applicant, resulting in more work for the park during the application process. Although park staff time would be impacted with more time spent on processing WTF applications, these changes would be expected to be long-term minor adverse and could be accommodated within existing staff and budget.

Cumulative Impacts. In the no-action alternative, past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to park operations and maintenance would include a variety of other daily operations and maintenance requirements for the 99 units managed by Rock Creek park. A sample of these commitments would include routine trail maintenance, hazard tree removal, snow removal, landscape maintenance. The park also manages numerous special events during the year at the tennis center and Carter Barron Amphitheater, as well as managing volunteer groups that come to the park. The combination of these daily operations and maintenance requirements would be noticeable at times, requiring the shifting of staff around to accommodate all these needs. These actions would result in long-term moderate adverse impacts.

The impacts on park operations and management resulting from these past, present and future actions, in combination with the long-term minor adverse impacts for the no-action alternative, would result in long-term minor to moderate adverse impact to park operations and management.

Conclusion. The lack of pre-determined areas and associated permit terms and conditions for WTF would result in longer application process and have long-term minor adverse impacts. Cumulative impacts to park operations and management for the no-action alternative would be long-term minor to moderate adverse.

Impacts of Alternative B: Zone Management

Analysis. In alternative B, the park would continue to process applications based on the guidance provided in RM-53, and all other applicable laws and regulations as described in chapter 1. However, this alternative would set additional guidelines about the types of facilities that would be sited in certain areas of Rock Creek Park based on planned land uses for these units, or any conflicts with the mission of these units. Where applications for WTF would be approved for siting, this alternative details permit terms and conditions that would be applicable in each unit or zone. Applicants would submit applications to the park knowing in advance what permit terms and conditions would be applicable in each zone, preventing staff from having to go through an application that does not contain these terms and conditions where there would be a known conflict with planned land uses or park mission. Since applicants would know where an application would be approved for siting and what types of terms and conditions would be required on

the permit, they can use this information to create a submittal that would need to go through less revisions to meet the requirements of the park. This alternative would help the park to further standardize the process of evaluating applications for these types of facilities and would assist in the park meeting the 120-day timeline provided in RM-53, when possible. This process would be more efficient for park staff, allowing them to process applications in a timelier manner, but would not be expected to impact the park budget, and create a small, but measurable, impact to staff time available for other park operations. Because the impacts would be small, but detectable, impacts for alternative B would be long-term and beneficial.

Cumulative Impacts. In alternative B, past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to park operations and maintenance would include a variety of other daily operations and maintenance requirements for the 99 units managed by Rock Creek Park. As described in the no-action alternative, these daily operations and management activities would result in long-term moderate adverse impacts.

The impacts on park operations and management resulting from these past, present and future actions, in combination with the long-term beneficial impacts for alternative B, would result in long-term negligible adverse impact to park operations and management.

Conclusion. Because a more formalized process would be created with set areas for consideration, as well as potential permit terms and conditions, the application process for WTF would be more efficient, resulting in long-term beneficial impacts. Cumulative impacts for alternative B would be long-term, negligible, and adverse.

Impacts of Alternative C: Management to Focus on Coverage Gaps (Preferred Alternative)

Analysis. In alternative C, as with alternative B, the WTF application process directed by RM-53 would be further refined by encouraging applications in specific areas of the park and providing specific permit terms and conditions for facilities size and appearance in the areas with known coverage gaps. As with alternative B, these additional guidelines would be expected to make the application process more clear for the applicant and reduce the number of times that the applicant needs to coordinate with the park in order to present an application that is not in conflict with the park mission or planned land uses. This alternative would help the park to further standardize the process of evaluating applications for these types of facilities and would assist in the park meeting the 120-day timeline provided in RM-53. This process would be more efficient for park staff, allowing them to process applications in a timelier manner, but would not be expected to impact the park budget, and create a small, but measurable, impact to staff time available for other park operations. Because the impacts would be small, but detectable, impacts for alternative C would be long-term and beneficial.

Cumulative Impacts. In alternative C, past, present, and reasonably foreseeable future actions that would contribute to cumulative impacts to park operations and maintenance would include a variety of other daily operations and maintenance requirements for the 99 units managed by Rock Creek Park. As described in the no-action alternative, these daily operations and management activities would result in long-term moderate adverse impacts.

The impacts on park operations and management resulting from these past, present and future actions, in combination with the long-term beneficial impacts for alternative C, would result in long-term negligible adverse impact to park operations and management.

Conclusion. Because a more formalized process would be created with set areas for consideration, as well as potential permit terms and conditions, the application process for WTF would be more efficient, resulting in long-term beneficial impacts. Cumulative impacts for alternative C would be long-term, negligible, and adverse.

CONSULTATION AND COORDINATION

The NPS places a high priority on meeting the intent of public involvement in the NEPA process that includes giving the public an opportunity to comment on proposed actions. As part of the NPS NEPA process, issues associated with the action were identified during the internal scoping meeting with NPS staff, during coordination with the U.S. Park Police, which is part of the NPS, and with other affected agencies and stakeholders. Stakeholders include congressional representatives for the District of Columbia; District of Columbia agencies; local and national businesses with an interest in WTF, such as cellular providers; and the general public. NPS, in addition to consulting with its own specialists, also contacted outside subject matter experts regarding issues related to the construction, operation, and maintenance of WTF, and other related issues such as the impact of such structures to birds. These contacts included academic researchers, the U.S. Fish and Wildlife Service, the FCC, State Historic Preservation Officers and the Advisory Council on Historic Preservation.

PUBLIC MEETINGS AND COMMENT PERIOD

In addition to the scoping within the NPS and with other public officials, public scoping for the WTC plan/EA began on April 9, 2007, and concluded on May 13, 2007. During this time, two public scoping meetings were held (April 24 and April 25, 2007) that included an open house, presentation by the NPS, and an opportunity for formal public comment. The purpose of these meetings was to solicit public input, especially on issues and ideas for alternatives. The meetings were held at the Rock Creek Park Nature Center in Washington, D.C. Notices of the meetings were posted on the NPS's Planning, Environment, and Public Comment website (PEPC). Additionally, NPS sent notices of the meeting to individuals on Rock Creek Park's mailing list including organizations listed below through a project newsletter.

NPS provided a 35-day public comment period through which the public could, in addition to commenting at the public meetings, participate by mailing comments to the NPS or providing them on the NPS PEPC website. The majority of public comments received during the public meetings and public comment period focused primarily on the impact of WTF on the well-being of bird species that use the park either permanently or as a migratory stop-over. Consequently, public comment also focused on facility design, with specific attention to its impacts on birds. Other major comment topics highlighted support for co-location, offered differing opinions about coverage needs within park boundaries, and suggested that more telecommunications facilities are unnecessary. The comments received during the public comment period, whether at the meetings, by mail, by email, or through the NPS PEPC system, are incorporated in the WTF plan/EA.

CONSULTATION

Coordination with local and federal agencies and various interest groups, as described above, was conducted during the NEPA process to identify issues and/or concerns related to WTF within Rock Creek Park. Notice of this plan/EA will be posted on PEPC and the following organizations, agencies, and individuals will be notified of its availability.

Member of Congress for the District of Columbia

- Eleanor Holmes Norton

Federal Agencies

- Advisory Council on Historic Preservation
- U.S. Commission of Fine Arts
- Federal Aviation Administration
- Federal Communications Commission
- National Capital Planning Commission
- Smithsonian National Zoo Police
- State Department—Embassies
- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service, Chesapeake Bay Field Office
- U.S. Navy, Naval Observatory
- U.S. Secret Service
- Veterans Administration
- White House Communications Agency, Telecommunications Certification Office

DISTRICT OF COLUMBIA, STATE, AND LOCAL GOVERNMENTS

- D.C. Mayor Adrian Fenty
- Advisory Neighborhood Commissions of the District of Columbia
- D.C. City Council
- D.C. Department of Environment
- D.C. Department of Transportation
- D.C. Fire and Emergency Services
- D.C. Historic Preservation Office
- D.C. Metropolitan Police Department
- D.C. Office of Planning
- D.C. School District
- D.C. Water and Sewer Authority
- Maryland National Capital Park and Planning
- Montgomery County Government, Maryland
- Prince George's County Government, Maryland
- Washington Metro Area Transit Authority

Organizations/Others

- AT&T Wireless, Atlanta, GA

- Property owners adjacent to Rock Creek Park boundary in Washington, D.C.
- American University, Washington, D.C.
- Audubon Naturalist Society, Montgomery County, Maryland
- Audubon Naturalist Society of Central Atlantic States, Montgomery County, Maryland
- Brain Injury Association of America, Vienna, VA
- Cellular Telecommunications Industry Association, Washington, D.C.
- Clear Channel Communications, Inc., San Antonio, TX
- Clemson University, College of Agriculture, Forestry and Life Sciences, Clemson, SC
- Crowell & Moring, LLP, Washington, D.C.
- D.C. Arts in the Community, Washington, D.C.
- D.C. Hospital Association, Washington, D.C.
- D.C. Statehood Green Party, Washington, D.C.
- Fraternal Order of Police Friends of Rock Creek Environment (FORCE), Washington, D.C.
- Georgetown Clinical Society, Washington, D.C.
- Georgetown University, Washington, D.C.
- Girls and Boys Town of Washington, D.C., Washington, D.C.
- Howard University WHUT, Washington, D.C.
- Ideal Electrical Supply Corporation, Washington, D.C.
- Institute for Public Representation, Georgetown University Law Center, Washington, D.C.
- Latino Economic Development Corporation, Washington, D.C.
- Maryland Native Plant Society, Silver Spring, MD
- Minority Business Coalition, Washington, D.C.
- National Coalition to Save Our Mall, Rockville, MD
- Neighboring community associations for communities adjacent to Rock Creek Park in Washington, D.C.
- Sprint Nextel, Reston, VA
- North Rock Creek Park Alliance, Washington, D.C.
- Office of People's Council of D.C., Washington, D.C.
- Sierra Club, San Francisco, CA
- Sprint, Reston, VA
- T-Mobile, Inc., Albuquerque, NM
- The Greater Washington Board of Trade, Washington, D.C.
- The Potomac Conference, Staunton, VA

- University of the District of Columbia, Washington, D.C.
- Verizon Wireless, New York, NY
- Washington Area Bicyclist Association, Washington, D.C.

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NATIONAL PARK SERVICE

Rock Creek Park

Adrienne Coleman. Superintendent of Rock Creek Park since 1997. She is a 22-year employee of the National Park Service. She began her Park Service career with the U.S. Park Police as an Analyst in the Office of Planning and Development. Prior to coming to Rock Creek Park, Ms. Coleman headed a management consulting division in the National Park Service where she directed the development and implementation of more than 200 partnership and interagency agreements designed to support park programs, and administered grants to non-profit organizations in support of resource protection activities.

Cynthia Cox. Serves as Assistant Superintendent in Rock Creek Park, as such her concentration is park operations. Through her 22-year tenure in the National Park Service she has focused on the wide-ranging challenges of urban national parks and has held various positions of responsibility including Supervisory Horticulturist and Chief of Maintenance. She earned a Bachelor of Science degree in ornamental horticulture from the University of Maryland (1976).

Kenneth Ferebee. Natural Resource Management Specialist. A 19 year National Park Service employee, Ken started his career at the Chesapeake and Ohio Canal NHP as an interpreter. He has served in his current position at Rock Creek Park since 1991. Areas of responsibility include wildlife, integrated pest, vegetation, fire, and trails management. He earned a B.S. degree in Forestry and Wildlife from Virginia Polytechnic Institute and State University (1984).

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Lindsay Gillham. Currently serves as an Environmental Protection Specialist with six years of professional NEPA experience. She has a J.D. from the University of Oregon School of Law and a B.S. in Natural Resources from Colorado State University.

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Cityscapes Consulting, Inc.

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Frequency Coordination Committee; Spectrum Manager for Five NFL Super Bowls.
Responsibility: technical advice on issues related to WTF.

Susan Rabold. Telecommunications Planner. B.S. Geography. Experience: wireless technology plan development for facility siting, land use planning and zoning. Responsibility: technical advice related to issues on WTF siting.

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Juanita Barboa. Technical Editor. B.S. Technical Communication. Experience: document project management, including NEPA documents. Responsibility: technical editing, formatting, and graphic design.