In alternative C, the protection, preservation, and interpretation of the unit's coastal defense fortifcations, aviation structures, and cultural landscapes would be substantially increased. The aviation history at Floyd Bennett Field would be preserved and showcased.

Developed Zone

Within this zone, existing infrastructure and maintenance areas would remain, where appropriate. Location of new facilities would be determined in subsequent planning efforts.

Alternative C: Experiencing Preserved Places

This alternative provides the most opportunities for independent exploration and "wild" experiences that immerse visitors into natural areas, historic sites and landscapes. Natural systems, historic sites and landscapes receive the highest levels of preservation and restoration in this alternative. This alternative increases the visibility, enjoyment and protection of coastal resources and focuses resource management on beach and dune ecosystems and coastal defense landscapes. New recreational programming emphasizes low impact activities that facilitate enjoyment of historic settings and natural areas and emphasize opportunities for education and interpretation through hands-on learning and stewardship opportunities. This alternative maximizes sustainable operations and concentrates activities, access and facilities in distinct locations in order to improve operational effciency and energy conservation.

Jamaica Bay Unit

Recreation and Visitor Experience

Throughout the Jamaica Bay Unit, such as Breezy Point Tip, Fort Tilden, the Jamaica Bay Wildlife Refuge, and Floyd Bennett Field, visitors would fnd open, protected natural areas. In these area visitors can retreat into natural environments; experience the sounds, smells, and views; and learn about healthy habitat remnants that are unique within the New York City metropolitan area. Clusters of recreation facility development throughout the unit's park lands including trail networks, campgrounds, and observation platforms would encourage independent discovery and facilitate outdoor recreation. All new facilities would be designed to be "light on the land" and minimize impacts on natural and cultural resources.

This alternative would focus on engaging visitors, communities, and partners in participatory science, education, and natural resource stewardship while creating opportunities for self-guided exploration of the area's natural environmental and historic settings. The NPS and partner stewardship programming would harness volunteer energy and work toward improving water quality and habitat conditions throughout Jamaica Bay. In addition, increased monitoring, research, volunteer programs, and collaboration with regional partners would continue to address water quality issues, habitat restoration, and stewardship.

Alternative C: Experiencing Preserved Places

General Management Plan
Gateway National Recreation Area - Jamaica Bay Unit

United States Department of the Interior - National Park Service
2014

Management Zones

- Marine
- Recreation
- Active Beach Subzone
- Community Activity Subzone
- Natural
- Sensitive Resource Subzone
- Historic
- Ruins Subzone
- Developed

- GATE Legislative Boundary
- Existing Trail / Bike Path
- NYC / Other Federal Agency Land
- City / County / State Park Land

North

0 1 Mile
.5 Miles

Fountain Ave Park
Spring Creek Park
Pennsylvania Ave Park
Belt Parkway
Frank Charles Memorial Park
Hamilton Beach Park
Canarsie Pier
Canarsie Park
Spring Creek
North Channel Joseph P. Addabbo Bridge
Elder's Point
Bergen Beach
Canarsie Pol
JFK International Airport
Jamaica Bay Wildlife Refuge
Marine Park
Flatbush Avenue
Mill Basin Inlet
Jamaica Bay
Cross Bay Blvd
North Forty
Floyd Bennett Field
East High
Yellow Bar
Ru´e Bar
JoCo
Gateway Marina
Hangar Row
Plumb Beach
Dead Horse Bay
Broad Channel
Little Egg
Big Egg
Silver Hole
Rockaway Community Park
Rockaway Inlet
Marine Parkway Gil Hodges Mem. Bridge
Cross Bay Veterans Mem. Bridge
Rockaway Point Blvd
Battery Harris
Riis Landing
Jacob Riis Parking Lot
Roxbury
Breezy Point Surf Club
Breezy Point Co-Op
Silver Gull Beach Club
Nike Missile Launch Site
Jacob Riis Bathhouse
Rockaway Beach and Boardwalk
Breezy Point
Fort Tilden
Jacob Riis Park
Atlantic Ocean

Table 2-7. Jamaica Bay Unit - Alternative C - Summary.

Desired Experience	Types of Change	Where Change May Occur
Programmatic and stewardship connections created to link Gateway sites, New York City parks, and neighborhoods to Jamaica Bay	Δ New programs and stewardship opportunities	Δ Unit-wide
Natural immersion opportunities are developed and promoted	Δ Create learning opportunities and services for activities such as kayaking and wildlife observation Δ Formalize nature trails to bays and waterways for fshing, walking Δ Establish overlooks for outstanding/distance views of bays and ocean Δ More nature trail and nature observation facility development	Δ Unit-wide
Environmental education	Δ Improve or develop places to learn about bay-related resources such as salt marsh, wetlands	Δ Floyd Bennett Field Δ Bergen Beach Δ Plumb Beach Δ Fort Tilden
Recreation improvements	Δ ~~New picnic and open space area at Spring Creek~~ Δ Equestrian use at Floyd Bennett Field or Fort Tilden Δ Improved launching areas for human-powered boating ~~and wind sports~~ Δ Trailheads and parking areas, orientation kiosk, trails and picnic areas	Δ Bergen Beach Δ Plumb Beach Δ Canarsie Pier Δ Landflls Δ ~~Spring Creek~~ Δ Floyd Bennett Field Δ Fort Tilden Δ Jamaica Bay Wildlife Refuge
Offer low impact camping opportunities	Δ Create low-impact camping areas and support services Δ Offer special camping programs in places like historic buildings or natural areas.	Δ Bergen Beach Δ Floyd Bennett Field Δ Fort Tilden
Connect park sites through trails and paths	Δ Convert former roads into trails Δ Improve biking and walking infrastructure and circulation Δ Improve access and linkages to Jamaica Bay ~~NYC Greenway~~	Δ Unit-wide
Formal water trails established	Δ Establish new water trails connecting to NYC parks and other Gateway areas	Δ Unit-wide
Expand access to Jamaica Bay and other waterways	Δ Improve marina area at FBF Δ New boat sites, storage, shuttles, and equipment rental	Δ Unit-wide

Resource Management

Under alternative C, natural resource restoration projects would be widespread throughout the Jamaica Bay Unit. Ongoing restoration, research, and environmental protection projects would be broadened, expedited and strengthened by outside funding, and the involvement of additional partners and the broader scientifc community. Management would focus on protecting and restoring natural conditions throughout the unit including hassocks and water quality within the bay, freshwater marshes at Breezy Point and Tilden's scrub/shrub-dominated covered dunes and grassy/forb-dominated fore and inner dunes. This more robust natural resource management would be complemented by expanded outreach, environmental education programming, citizen science, and volunteer stewardship projects. Along with this enhanced natural resource management would come expanded opportunities for nature-study, environmental educational and participatory natural resource stewardship programming.

A designated natural area to the east with interpreted nature trails and outdoor education facilities would provide more opportunities for volunteer projects, environmental education programming, and quiet nature study.

In alternative C, the protection, preservation, and interpretation of the unit's coastal defense fortifcations, aviation structures, and cultural landscapes would be substantially increased. The aviation history at Floyd Bennett Field would be preserved and showcased. On the Rockaway Peninsula, preservation and interpretation of Fort Tilden's cultural landscape, batteries, the Nike Missile site, and the Jacob Riis landscape would round out the predominantly natural resource-based recreational experiences found throughout the unit and result in richer communication about the area's history. Extensive preservation and interpretation projects at Fort Tilden's Battery Harris and the Nike Missile site would lead to improved access to the fundamental cultural resources and enriched communication about the site's coastal defense history.

NPS would work closely with the NYCDPR and other landowners to build the resiliency of coastal habitat and to improve conditions along the entire Rockaway coastline from Breezy Point Tip to NYC Rockaway parks. Together the agencies would produce a holistic shoreline management plan that would help guide recovery efforts and future uses and development. The effects of climate change and these park lands' vulnerability to future storms would continue to be studied.

Transportation

Similar to alternative B, but with less of an emphasis on waterborne transportation, management would make accessing the Jamaica Bay sites more convenient by establishing an interconnected system of trails and greenways, introducing bike-sharing stations, improving shuttle services between districts and linking to public transit stations. A transportation hub would be created at Floyd Bennett Field to improve access and circulation and to promote multi-modal options.

Plumb Beach

Natural Zone

The beach would be managed for nature-oriented, low-impact activities such as wildlife observation and environmental education. A designated natural area with interpreted

nature trails and outdoor education facilities would provide more opportunities for volunteer projects, environmental education programming, and quiet nature study. The NPS would tie programming at Plumb Beach into New York City's environmental education programming at the Salt Marsh Nature Center in Marine Park. Similarly, the NPS and its partners would expand and offer volunteer and educational programs. The NPS will work with the NYCDPR, to improve programmatic and stewardship opportunities with adjacent neighborhoods and other nearby park lands including Marine Park, Floyd Bennett Field, and Dead Horse Bay. The NPS would work with New York City ~~and NYCDOT~~ agencies. improve conditions of the parking lot. The existing building would be rehabilitated to accommodate administrative uses and to support restoration efforts (e.g., tool storage) and stewardship projects and programming. The building would likely be jointly managed by the NPS and New York City.

Social trails would be eliminated and access to the Natural Zone would be controlled in order to prevent trampling of vegetation, reduce impacts to wildlife and ensure restoration efforts are successful. NPS would minimize disturbance to the saltmarsh and intertidal habitat by reducing foot traffc and limiting travel to a designated trail corridor. Additionally the saltmarsh and eastern end of beach would be evaluated to better understand its potential habitat value. Bioengineering techniques would be used to stabilize eroding beach and dune areas with plantings of native coastal trees and shrubs.

Improved wayfnding, interpretive and orientation facilities and materials would orient visitors to the resources that can be found throughout Jamaica Bay and Gateway. The marina would serve as a water-based access point for ferries, water taxis, and other boats.

Sensitive Resources Subzone

Access to the Sensitive Resources Subzone would be limited to guided tours, volunteer stewardship projects, research and educational programs. Through signs and increased enforcement, the NPS would prevent illicit damage to horseshoe crabs and other wildlife.

Floyd Bennett Field

Recreation Zone

Floyd Bennett Field would become a destination for learning about and experiencing aviation history and participating in nature-oriented activities and experiences. NPS would focus on providing opportunities for self-guided exploration of the feld's natural resources and expanding opportunities for natural immersion, and interpretive and educational programming.

New recreation development would be clustered in order to minimize impacts on the natural environment and to maximize the amount of space devoted to either habitat restoration and/or historic preservation. Overall, in this alternative, new recreation development is minimized and the NPS focuses more resources on expanding interpretive and educational programming.

Smaller-scale, concentrated camping areas would be established with the highest level of consideration to green design that serves as both an educational and recreational opportunity. NPS and its partners would offer skill building camping programs with a focus on encouraging independent exploration and healthy outdoor recreation. In this alternative, facilities would be designed and scaled to provide visitors quieter, more secluded nature and overnight experiences than offered in alternative B.

Along stretches of coastline that are not targeted for restoration, access to and recreational use of the shoreline for fshing, nature study and kayaking/ boating would be increased.

The arrival sequence to the park would be improved with increased access to the airfeld's main visitor facilities off Flatbush Avenue. Through improved circulation and wayfnding signs, a more welcoming sense of arrival would be established. Improved transportation infrastructure would likely be divided between the Recreation Zone and the Developed Zone. Floyd Bennett Field would be established as the most accessible park in Jamaica Bay and the airfeld would serves as a multi-modal transportation hub developed to provide transportation access and visitor distribution (via public transportation, shuttles, bikes, water taxis, etc.) to park lands throughout Jamaica Bay. Connecting the airfeld's main visitor facilities and internal trail network with the Jamaica Bay Greenway would ensure convenient trail access to the park. Improved wayfnding, interpretive and orientation facilities and materials would orient visitors to the resources that can be found throughout Jamaica Bay and Gateway. The marina would serve as a water-based access point for ferries, water taxis, and other boats.

Natural Zone

Habitat protection and wetlands restoration would be extensive. Within the North Forty and Mill Basin area, the shoreline would be softened through the removal of impervious surfacing and the restoration of former saltmarshes, sandspits, and intertidal mudfats. Additionally, more freshwater wetland habitat would be created than in alternative B. There would also be extensive restoration of former saltmarshes, sandspits, and intertidal mudfats. Areas south of Dead Horse Bay would be restored as tidal mudfats.

Existing grasslands habitat would be managed and maintained for ecological function and values. Grassland habitat would be actively managed to support butterfy, moths, bluebird and grassland-dependent birds including migrants (e.g. Bobolink) that use the Floyd Bennett Field grasslands as stop-over sites. Managed lawn in certain areas would be allowed to convert to natural meadows and when building or impervious surface removal allows, new areas of grassland would be established elsewhere on the site.

Portions of the North Forty would be converted to freshwater wetland habitat. Areas not converted or restored to wetland as part of the wetland interpretive center, would continue to be managed as upland forest. Expanded visitor use in the North Forty would be compatible with the protection of the remaining species-rich forest in the North Forty including successional maritime forest. Shrubland communities found in the back dune areas Floyd Bennett Field area including the Northern Bayberry Dune Shrubland and Northern Beach Heather Dune Shrubland would be protected and maintained.

Under alternative C, more extensive habitat restoration and habitat construction would occur than under alternative B. Aside from these trail corridors, new built visitor facilities will be minimal and limited to small-scale, low impact developments such as viewing blinds and observation platforms. The public would experience the new and restored habitat via trails and boardwalks. Under alternative C, the center would serve as an area where volunteers are trained for natural resource stewardship projects throughout Jamaica Bay.

The zone would be open to nature-based recreation along designated, soft-surface trails. The area would provide a venue for both environmental education programming and volunteer stewardship projects. Volunteers would be tasked with projects such as monitoring, native plantings and weed control. As in alternative B, visitors would encounter

facilities such as blinds, scopes, observation decks and boardwalks along the trails. Along with interpretive materials, these facilities would be designed to facilitate nature study, wildlife observation and immersion in a natural setting. A limited number of low-impact camping facilities would be sited in the Natural Zone.

Marine Zone

Along stretches of coastline that are not targeted for restoration, access to and recreational use of the shoreline for fshing, nature study and kayaking/boating would be increased. Like in alternative B, a water trail would be established offshore and NPS and its partners would offer boat tours that allow visitors to experience the airfeld and Jamaica Bay by water.

The ~~Gateway Marina~~ park would offer more public uses, including boat rentals, water-based recreation, and boating/sailing lessons. The enhanced marina area would serve as the Jamaica Bay unit's primary portal for experiencing the bay by waters. Guided interpretive boat tours as well as a designated water trail would encourage people to explore the airfeld and other Jamaica Bay resources from the water. Additionally, greater shoreline access and several launch sites for human-powered boats (e.g. kayak, canoe) throughout this zone would create more boating and fshing opportunities.

Historic Zone

Compared to alternative B, more of Floyd Bennett Field would be dedicated to historic preservation and aviation interpretation with larger portions of the airfeld's cultural landscape preserved and more character-defning landscape elements would be restored. Through cultural landscape restoration of select character-defning features and the adaptive reuse of historic aviation structures along Hangar Row, the experience of Floyd Bennett Field would be enriched through interpretation and immersion in a preserved historic setting.

The Aviation District would be energized and activated with abundant visitor use and interpretive experiences. The rehabilitated hangars and cultural landscape would feature aviation exhibits, aircraft collections, and fexible interior and exterior spaces and would provide space for community activities, informal gatherings, interpretive programs, and special events. Prominent buildings and character-defning cultural landscape elements that reveal the aviation history of the airfeld (such as Ryan Center, Hangar Row and runways) would be preserved and interpreted.

The period of signifcance for this cultural landscape would be the Municipal Airport Era. Current development located within this Aviation District that is not compatible with the airfeld's historic character would be removed and the uses would be relocated to areas outside of the zone. Alternative C would include the preservation and, in some cases, restoration of many more character defning features of the cultural landscape such as vegetation, lighting, circulation patterns and entrance sequence to the Ryan Center, small-scale features and these features would be interpreted for visitors. Within the Aviation District, adaptively reused historic hangars, new structures, events, and exhibits, as well as preserved cultural landscape elements such as the runways, would create venues for interpreting a wide variety of topics from natural resources and habitat restoration to aviation history.

Like in alternative B, the southern portion of the airfeld would be designated as a Developed Zone that would accommodate transportation infrastructure as well as operations and maintenance facilities.

Bergen Beach would be managed as a natural area with opportunities for quiet, nature study, research, volunteer stewardship, environmental education, and interpretive programming.

The historic aviation buildings along Flatbush Avenue known as Hangar Row would be rehabilitated to provide a range of visitor activities and uses that could include exhibits, informal gatherings, interpretive programs, and special events. The historic plane collection would be relocated from Hangar B to Hangar Row. Current uses of Hangar B would be relocated to Hangars 3 and 4. Future uses of Hangar B would continue to be explored and may include the rehabilitation of the hangar and site for an entertainment venue.

Developed Zone

Like in alternative B, a portion of the airfeld would be designated as a Developed Zone that would accommodate transportation infrastructure as well as operations and maintenance facilities. In areas not needed to support operational or visitor uses, impervious surfaces would be removed and grassland or other native vegetation would added.

Existing maintenance facilities would be reconfgured in the Developed Zone and new maintenance areas and storage and operation facilities would be developed in order to care for new recreation facilities, accommodate increased visitor numbers, and protect and preserve both natural and cultural resources. These new and expanded operations and maintenance facilities would be clustered in one area.

The NPS and New York City would continue evaluating the technical and environmental feasibility of siting a facility in the park that would process food waste, vegetation, and other organic matter from concession stands, restaurants, groceries, and other sources in and around the park and local vicinity.

A separate access for commercial, operational and maintenance vehicles that allows for direct access to the Developed Zone would be maintained. Uses by other agencies would be screened in order to minimize its visual impact on any visitor uses that would occur in the southern portion of the airfeld. Some uses may be permanently removed from the airfeld in the future.

Bergen Beach

Natural Zone

Bergen Beach would be managed as a natural area with opportunities for quiet, nature study, research, volunteer stewardship, environmental education, and interpretive programming. Existing equestrian facilities would be removed, relocated, or repurposed, and the equestrian use areas would be restored to natural conditions. The park would be made more accessible and would cater to nature study. Facility development and programming would facilitate nature-based activities such as volunteer stewardship projects, guided nature tours, research, and self-guided nature study as well as permitted research. Bergen Beach will be designated as a research area for urban ecology and the study of other relevant research topics. Additionally, the area will be a center for volunteer stewardship projects and training as well as environmental education programs. A limited number of backcountry camping sites would be developed.

To prevent trampling of vegetation, reduce impacts to wildlife and ensure restoration efforts are successful, visitor use would be limited to designated trails within the Natural Zone. Trail development may include the addition of interpretive media as well as observation facilities such as viewing blinds.

Natural conditions would predominate at Bergen Beach and NPS and its partners would spearhead a number of restoration projects to protect and enhance the area's coastal habitats. More extensive beach/dune habitat restoration would be undertaken including bioengineering techniques would be used to stabilize eroding natural areas with plantings of native coastal trees and shrubs. Beach/dune habitats along with fringe wetlands would be protected, maintained, and restored. Efforts to control and eradicate *Phragmites* and other invasives would also be increased.

At the Pennsylvania Avenue Park, the existing roads would be converted into a multi-use trail system. Facilities such as viewing platforms and/or overlooks would be developed to take advantage of the landfll's elevation and the views of Jamaica Bay.

~~**Canarsie Pier**~~

~~The same as alternative B, Canarsie Pier would become a vibrant destination for community-oriented events as well as water-related recreational activities. Given its location on the Belt Parkway and proximity to dense housing developments, Canarsie Pier would serve as a new orientation portal for the Jamaica Bay park lands and Gateway. The pier would be improved to include orientation media such as a kiosk with a park map. Given the park's close proximity to New York City's Canarsie parks, the NPS would work closely with the NYCDPR on programming, transportation, and other management issues.~~

~~Canarsie Pier would serve as another Jamaica Bay hub for waterborne transportation and water trail connections to other park lands. A launch site would provide access to a designated water trail for human-powered boat exploration. Additionally, if it is demonstrated that the pier could support a ferry and or water taxis, it could also become a launch site for guided Jamaica Bay boat tours. The NPS will work with the NYCDPR to improve connections from Canarsie Pier to New York City's Canarsie parks and to improve trail linkages to the Jamaica Bay Greenway. Additionally, the NPS and its partners~~ would actively target outreach to neighboring residents and encourage them to use the ~~park's resources.~~

~~The pier and its outlying spaces would be improved to better accommodate community events such as concerts, markets, and festivals. Additionally, spaces for picnics and group gatherings would be expanded and enhanced though shade trees and other plantings. Along the coast on either side of the pier, the NPS and its partners would develop improved visitor facilities for fshing, kayaking, and other human-powered watercraft. Improvements would include lessons and a designated instructional and beginner paddling zone as well as equipment rentals. The existing contact station could be adaptively reused to support community use and to provide expanded visitor amenities.~~

~~Restoration projects to the east and west of the pier would strive to create a healthy shoreline habitat and an intertidal zone. Areas of saltmarsh and forested areas along the shoreline extending from Bergen Beach to Fresh Creek would be observed and assessed for habitat value. Signs, trails and clear beach and water access points would be developed in order to control visitor traffc and minimize disturbance to the coastal habitat.~~

Pennsylvania Avenue and Fountain Avenue Parks

Recreation Zone

Under alternative C, the Pennsylvania Avenue and Fountain Avenue Parks would be developed for recreation and community use and would offer a wide range of recreation facilities as well as community gathering spaces. At the Pennsylvania Avenue Park, the existing roads would be converted into a multi-use trail system. Facilities such as viewing platforms and/or overlooks would be developed to take advantage of the elevation and the views of Jamaica Bay. Other facility development would be basic visitor amenities such as restrooms and orientation and wayfnding signs. All new development on both sites would be designed to respect the sensitivity of the cap and other infrastructure. Vegetation and native habitats established at the parks sites would be protected, maintained, and interpreted.

Outreach to surrounding communities and creative programming led by the NPS and its partners would foster lasting engagement and would attract more local residents to Jamaica Bay park lands. Physical connections between the Pennsylvania Avenue Park and its neighboring communities as well as nearby park sites would be improved.

Developed Zone

Renewable energy development would be explored at both Pennsylvania Avenue and Fountain Avenue Parks. While visitor access will be limited to guided tours, the NPS would incorporate renewable-energy development into its interpretive media.

Spring Creek

Natural Zone

Spring Creek would act as a gateway to Jamaica Bay for adjacent communities and provide convenient access to the water and expanded recreation opportunities. Under alternative C, more extensive habitat enhancements would take place at Spring Creek, including more native plantings and ongoing monitoring and assessment of saltmarsh and forested areas. Under this alternative, the NPS would work with a variety of partners ~~the NYCDPR~~ to improve habitat conditions along the natural corridor connecting Spring Creek with New York City park lands.

Jacob Riis Park

Recreation Zone and Active Beach Subzone

Jacob Riis Park would remain a destination for high-quality beach recreation activities. Riis would remain an active beach destination and would offer additional community recreation opportunities as well as nature and water- based recreation facilities. Facility development would be signifcantly less intensive than alternative B and larger areas of the park would be managed as fexible open spaces and/or natural areas.

Active beach use would be maintained and the visitor experience would be expanded with the development of a trail system, nature play features (e.g., dune playscapes), and boat launch. Additionally, shaded spaces for picnicking and gathering would be developed.

Even more impervious surfaces would be removed in this alternative and more of the park would be converted to fexible open spaces that can still accommodate recreation uses, but are more resilient to storm surges. Additionally, portions of the parking area would likely be converted to natural habitat and fexible open space.

The NPS would work with partners to adaptively reuse the bathhouse for a wide variety of uses, ranging from visitor amenities to interpretive exhibits to park operations. Interpretive programming at the site and digital media would be expanded to communicate the story of the bathhouse, recreation on the Rockaway Peninsula, and climate change.

Similar to alternative B, portions of the Jacob Riis parking lot would be adaptively reused for transportation facilities such as shuttle parking and a bike sharing station. The majority of the parking lot not needed for parking and transportation would be converted to fexible open spaces or natural habitats. In this alternative, NPS and partners would also investigate the possibility of using a portion of the parking lot for renewable energy development. Physical connection between Jacob Riis and the other park lands on the Rockaway Peninsula would be improved through a shuttle, linkages to public transportation and bike infrastructure.

Fort Tilden

Natural Zone

The park would be a destination for both nature-oriented recreation and historic interpretive experiences. Within the Natural Zone, Fort Tilden's largely undisturbed plant community with scrub/shrub-dominated covered dunes as well as grassy/forb-dominated foredunes and interdunes, would be protected, monitored, and enhanced. The beach intertidal zone, supratidal zone, and the grassy areas would continue to support marine invertebrates and other native wildlife. Visitors fnd opportunities for a diversity of opportunities to explore the site's natural environments and enjoy a quiet immersive experience in a predominantly natural area.

Beach and dune habitats would be actively restored following damage from Hurricane Sandy. As the scrub/shrub-dominated covered dunes as well as grassy/forb-dominated fore and interdunes are reestablished, these habitats would be protected and monitored. In alternative C, research of these habitats would be increased and Fort Tilden would become another center for volunteer-based stewardship, monitoring, and restoration projects.

Overall, facility development would be signifcantly less than alternative B. Many visitor amenities would be provided on a seasonal basis using mobile facilities. Limited, low-impact camping opportunities would be developed in the Fort Tilden backcountry. Fort Tilden's existing equestrian facilities would be improved and used to accommodate trail rides throughout the park. The trails network throughout Fort Tilden would be expanded and some trailheads and segments of the trails would be located within the Recreation

Beach and dune habitats would be actively restored following damage from Sandy. As the scrub/shrub-dominated covered dunes as well as grassy/forb-dominated fore and interdunes are reestablished, these habitats would be protected and monitored.

Zone. Improved trail system with trailheads and a robust backcountry trail experience along designated routes. Expanded interpretation along trails and interpretive programming would highlight both the natural and cultural resources. Fort Tilden remains an unguarded beach and offers more of a natural coastal experience than other Gateway beaches. Shore Road would be converted to a trail providing convenient access to the beach. Limited fshing access would also be provided. Fort Tilden would host a number of volunteer stewardship projects throughout the year.

Habitat value of the inlet side of Fort Tilden would be studied. If warranted, coastal habitat and wetland projects would be initiated. This area could also present opportunities for environmental education programming and limited public access for nature study.

Recreation Zone

Under alternative C, the Silver Gull Beach Club would be maintained. However, public use of the beach club would be expanded to include water-based and beach recreation opportunities such as educational and interpretive programming and guided kayak tours and lessons. NPS would work closely with concessionaire to ensure that future development of the beach club is more resilient to storms.

Historic Zone

At Fort Tilden, cultural resource preservation and stewardship projects as well as enhanced interpretation of the Fort's landscape, batteries and Nike missile site compliment the natural-resource based recreational experiences found elsewhere in the Jamaica Bay Unit.

Under alternative C, the Historic Zone is larger and preservation efforts are more extensive than in alternative B. Preservation projects under alternative C encompasses the batteries as well as the Nike Missile site and the Parade Grounds. Additionally, volunteers and partners would be engaged in the preservation of the cultural resources within the Historic Zone.

Battery Harris would be stabilized and made accessible. The battery's existing overlook would be improved and interpretive media and programming would be expanded. The Nike Missile site would also be stabilized and interpreted. Interpretation and programming at the missile site would be more extensive than in alternative B. Maintenance facilities would be moved out of the Nike Missile site to allow for interpretation and visitor access. Access to and interpretation of these resources would be improved through expanded trail network, enhanced interpretive media, and increased programming.

The cultural landscape ~~of the parade ground~~ would undergo signifcant preservation projects under alternative C, so that it would evoke the look and feel of the historic period. This would involve the removal of incompatible modern uses such as the athletic felds and ball felds. Depending on the results of the damage assessments of the parade ground, the buildings would continue to be adaptively reused be to support visitor facilities as well as community uses. Some rehabilitated buildings could provide overnight accommodates and visitor amenities needed to support overnight stays such as food service and equipment rentals. Additionally, the buildings would continue to accommodate community groups and could house additional interpretive exhibits and educational programming in the future.

The parade ground would serve as a primary center for historic preservation volunteer and training projects. Additionally, the history of Fort Tilden would be interpreted through interpretive media and exhibits as well as guided programs.

Circulation between Riis Landing and Fort Tilden and other park lands on the Rockaway Peninsula would be improved through shuttles, safer road crossings, and bike infrastructure. Fort Tilden would act as the orientation portal for park lands on the Rockaway Peninsula and would provide information on resources and opportunities offered throughout Gateway. A visitor contact station would be established within an existing building. Additionally, trailhead and parking areas would be provided.

Development Zone

Riis Landing would continue to serve as a ferry landing. Additionally, buildings at the site would be preserved and adaptively reused. Operations moved from the Nike Missile site at Fort Tilden would be relocated to Riis Landing or other areas. The buildings at Riis Landing would be preserved and leased for community and other uses.

Breezy Point Tip

In both alternatives, Breezy Point Tip remains an undeveloped natural area open to limited nature-based recreation. The Breezy Point Surf Club would be maintained. However, public use of the beach club would be expanded to include water-based and beach recreation opportunities such as educational and interpretive programming and guided kayak tours and lessons. NPS would work closely with concessionaire to ensure that future development of the beach club is more resilient to storms.

In this alternative, Breezy Point Tip would be managed as a natural area with a greater emphasis on protecting the signifcant shorebird and marine bird/waterfowl habitat. The area's unique combination of marine/exposed ocean beach/dune system with somewhat secluded back dunes and palustrine wetland swale features, as well as its salt panne pools would be monitored, protected and enhanced.

With its lighthouse, lifesaving station, and long coastline, Sandy Hook would emerge as Gateway's focal point for maritime heritage interpretation. The preservation of these iconic structures along with expanded programming, activities, and interpretive media would engage visitors in the parks maritime story.

Sandy Hook Unit

Recreation and Visitor Experience

Sandy Hook's beaches, forests, wetlands, and waters would serve as living laboratories where visitors and volunteers would be engaged in participatory science, education and stewardship. These programs would nurture personal connections with the coastal environment and inspire greater appreciation for the park's historic signifcance. Recreational uses would be maintained along the beach and bay.

Resource Management

Protection and restoration of the beach dune community as well as forest, shrub and wetland habitats at Sandy Hook would be increased in this alternative. To reduce impacts on these sensitive and rare habitats, access would be tightly controlled and restricted in

Additional batteries within the Fort Hancock area would be stabilized open to visitor access and interpreted. Batteries that would be preserved and interpreted through guided tours and/or interpretive media could include Batteries Potter, Gunnison, McCook and Reynolds (Mortar).

some cases. Aggressive control of invasive species, strengthening healthy communities and repairing beach erosion would be management priorities. Additionally, research and monitoring of the unit's habitats would be increased.

Historic preservation efforts would be most widespread in this alternative with the largest number of projects to stabilize, preserve, and interpret both historic structures and cultural landscapes. At Sandy Hook, historic preservation training programs would be offered and people would fnd opportunities to engage in volunteer stewardship projects. Students, partners, and volunteers trained at Sandy Hook would be mobilized to participate in historic resource stewardship projects throughout Gateway.

With its lighthouse, lifesaving station, and long coastline, Sandy Hook would emerge as Gateway's focal point for maritime heritage interpretation. The preservation of these iconic structures along with expanded programming, activities, and interpretive media would engage visitors in the park's maritime story.

Transportation

A variety of transportation systems would be developed to make Fort Hancock and the entire Sandy Hook peninsula more convenient to access. Within Fort Hancock, ferry service would be expanded to include summer weekdays, shoulder seasons and special events. Additionally a seasonal water ferry/taxi connection would be explored from other communities and NPS sites. Opportunities to provide private/transient water access and dockage at Sandy Hook would also be evaluated.

A shuttle system would relieve parking issues and traffc congestion and provide convenient access to the park. The shuttle would collect visitors from surrounding towns, transportation stops and the ferry terminal and drop them off at Sandy Hook's beaches and activity nodes. Opportunities would be explored with partners to extend public transit service into Sandy Hook, and initiate a transit shuttle to connect the Highlands. Interpretive media would be incorporated into both the on ferry service and/or internal landside shuttle system.

An expanded multi-use path network would traverse more of the peninsula and accommodate cross-island travel so people could explore both the ocean side and the bay side. Designated on-street bike routes from the Highlands would connect with regional trails serving the park unit. Bike access would be encouraged to/from and within Sandy Hook, with bike rental stations at parking facilities near the park entrance and within the park.

Parking options would be evaluated for remote intercept parking lot(s) outside of the Sandy Hook boundary with transit shuttle and/or bicycle connections provided into the park. Advanced traveler information systems would be improved with partners.

Historic Zone

The preserved and interpreted historic setting of Fort Hancock would provide for a variety of historic interpreted experiences. Additionally, the area would draw people interested in learning more about historic preservation and participating in hands on preservation projects. In alternative C, there would be a greater emphasis in also

Alternative C: Experiencing Preserved Places

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Gateway National Recreation Area - Sandy Hook Unit

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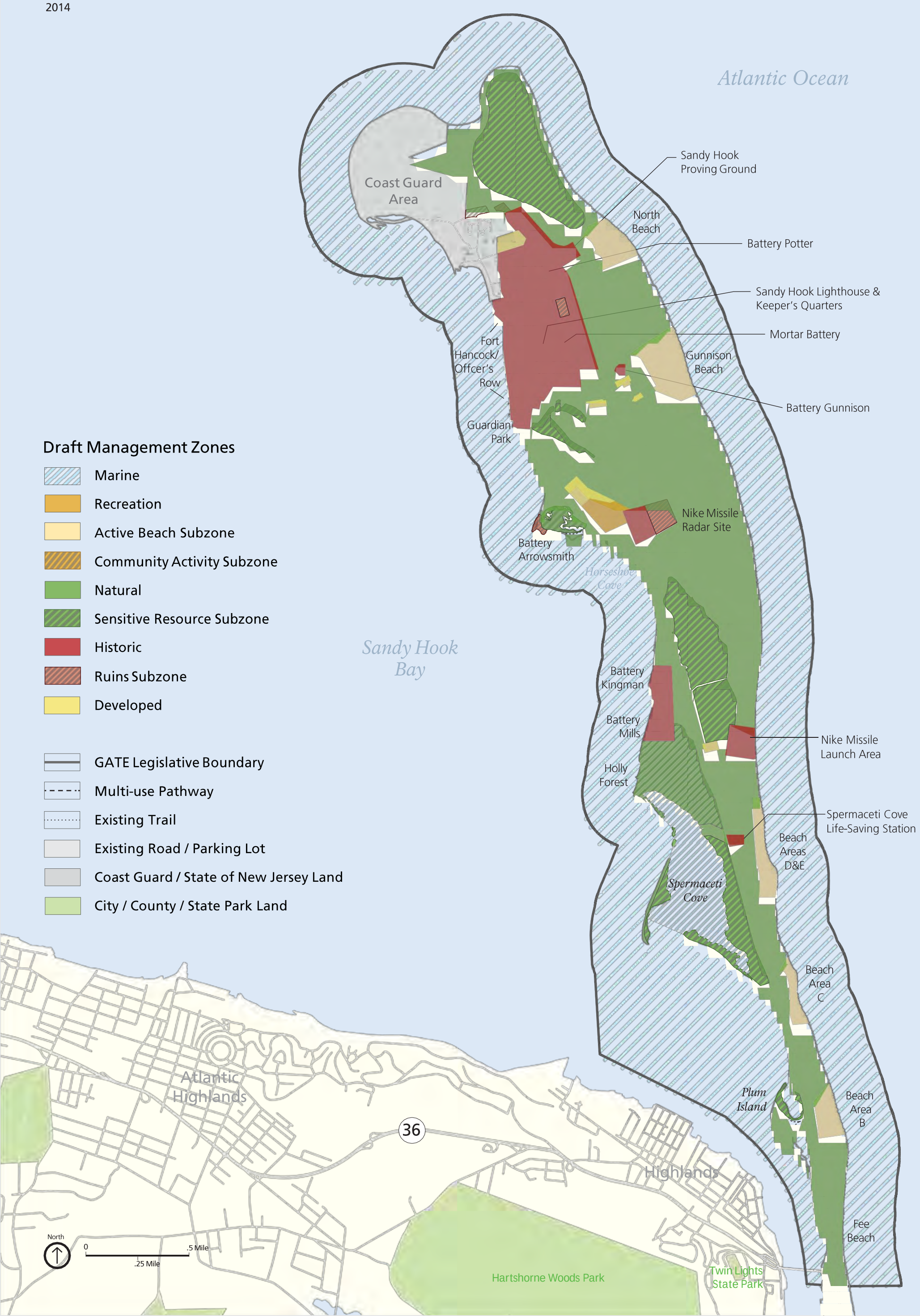

preserving and interpreting the Fort's cultural landscape and in expanding historic interpretive and educational programming at Fort Hancock. Additionally, in alternative C, the interior of buildings within Fort Hancock would be more intensively restored to their period of signifcance.

The cultural landscape within the Fort Hancock area would be maintained and the preservation of additional character defning features would reinforce the military character and function of the fort. Along with preservation efforts, the features of the cultural landscape would be interpreted and revealed to people visiting Fort Hancock through new programming, interpretive media and educational programming.

Additional batteries within the Fort Hancock area would be stabilized open to visitor access and interpreted. Batteries that would be preserved and interpreted through guided tours and/or interpretive media could include Batteries Potter, Gunnison, McCook, and Reynolds (Mortar). Along with the structures themselves, the historic setting of some of these batteries would be preserved to more accurately represent the historic period. Additionally, volunteer stewardship projects would engage people in the hands on care and preservation of these structures.

An interpretive Battery Trail would extend from Fort Hancock and allow for self-guided exploration of the fortifcations. The Battery Trail would provide greater access to the coastal defense structures within the Fort Hancock area and would provide a trail connection south to Batteries Kingman and Mills and north to the ruins of Batteries Morris and Urmston. The trail experience would be enriched by interpretive media of the structures and Sandy Hook's history (e.g. wayside signs, brochures).

Batteries Kingman and Mills would be stabilized, open to visitor access, and interpreted. Along with the structures themselves, the historic setting of some of these batteries would be preserved to more accurately represent the historic period. Additionally, volunteer stewardship projects would engage people in the hands-on care and preservation of these structures. Sandy Hook interpretive programming and media would also be expanded to incorporate these batteries.

The Nike Missile radar site would be converted into an interpreted, visitor-ready site. In alternative C, there would be more extensive preservation efforts, interpretation and programming related to the Nike Missile infrastructure on Sandy Hook than in alternative C. Alternative C would be more robust and the Nike Missile launch site would be converted into a primary interpretive destination. The interworkings of the launch site and the radar site would be interpreted. Preservation and restoration efforts at the launch and radar sites in combination with interpretive media would reveal what the site looked like during the Cold War era and allow visitors to visualize how Sandy Hook was employed to defend New York City over periods in U.S. history.

Recreation Zone and Active Beach Subzone

Recreational uses would be maintained. Redevelopment of the beach centers following damage from Hurricane Sandy would be dependent on an assessment of their vulnerability to future storms. Under alternative C, the redeveloped beach centers would all utilize

portable architecture technologies and as a result would offer fewer amenities than those in alternative B and would be suited for seasonal use only.

Access to the beaches and between the beaches and other destination on Sandy Hook would be improved through the development of additional modes of transportation. A land-based shuttle would provide more convenient access to the beaches and would link the beaches with Fort Hancock and the bayside visitor amenities. The shuttle would also provide connections to nearby communities and carpool parking areas. The addition of east and west lateral trail connections would facilitate travel from the Oceanside to the Bayside. Additionally, implementation of a bike sharing system on Sandy Hook would encourage bike travel along the peninsula along with expanded ferry service and the shuttle would reduce car-dependency among park visitors.

Camping opportunities would be more widely distributed throughout the park than in alternative A, but less so than in alternative B. Sites would be concentrated in fewer locations than in alternative B in order to minimize impacts and would include designated backcountry / beach camping, walk-in tent, drive-in tent and RV.

Natural Zone and Sensitive Resources Subzone

Coastal bay habitats would be improved through restoration projects would be ongoing. Control of invasive species within the Natural Zone and Sensitive Resource Area subzone would be increased. Monitoring and study of the Holly and Eastern Red Cedar Forests would be increased.

Under alternative C, the visitor experience of the bayside would be expanded to include more opportunities for nature study, environmental education programming and volunteer, natural resource stewardship. Throughout the Natural Zone, access would be restricted to designated trails and recreation areas to reduce impacts to the natural resources. Within the Sensitive Resource Subzone, visitor access would be highly restricted and limited to guided tours.

The existing multi-use path network would be expanded to include direct connections to the bay. The paved multi-use path would link into a network of soft surface trails that allow for self-guided exploration of the bay and inland natural environments.

Opportunities for self-exploration, facilities, media and programming that facilitate nature study and wildlife observation and enrich the visitor experience of Sandy Hook's natural environments would be expanded. An interpreted nature trail would lead people through the various habitats. Alongside the trail, facilities for observing natural and wildlife would be developed such as observation blinds, scopes, and species lists. NPS would work with partners to offer expanded wildlife-observation and nature study programming (e.g. seasonal events, ID workshops). Additionally, NPS and their partners would engage volunteers in monitoring, species counts and habitat restoration projects. Shaded areas would be developed on the bayside to accommodate groups and allow for picnicking in a natural setting.

Current protection, monitoring and study of the beach/dune habitats would be increased. Access to the Holly Forest, dunes, and saltmarshes would be increasingly restricted in order to minimize habitat impacts. Management would encourage invertebrate and shore bird use of the intertidal zone.

Marine Zone

The Atlantic Ocean waters off Sandy Hook's beaches would remain a protected natural area while accommodating water-based recreation. Conditions within Sandy Hook Bay would continue to be monitored and ongoing efforts to protect offshore habitats would be maintained.

Interpretive media and programming related to Sandy Hook's coastal habitats and maritime and coastal defense heritage would be expanded. This would include tying interpretation of Sandy Hook's cultural resources into other regional sites such as Twin Lights. Interpretive boat tours would also physically link Sandy Hook with other maritime and coastal defense sites.

Water-based recreation would be encouraged through expanded guided tours via boat or kayak. New launch/landing sites would be developed, however, to a lesser degree than in alternative B.

Natural resource protection of offshore habitats would be maintained within the Marine Zone. Research and monitoring of these habitats and wildlife would be increased. The use of offshore artifcial reefs to increase habitat and reduce wave action in eroding beach areas would be evaluated.

The Staten Island Unit would provide opportunities to experience nature, explore Fort Wadsworth's coastal defense heritage, and recreate in historic and natural settings.

Staten Island Unit

Recreation and Visitor Experience

The Staten Island Unit would provide opportunities to experience nature, explore Fort Wadsworth's coastal defense heritage, and recreate in historic and natural settings. Park managers would preserve historic structures and landscapes that tell the story of continuous military and civilian use of the fort and tie thematically with other parks and historic sites within New York Harbor. Recreational uses throughout the Staten Island unit would be maintained, and enriched by expanded interpretive and educational programming. Participatory cultural resource stewardship programming in which partners and volunteers would engage in the hands-on preservation of the coastal defense structures would be introduced at Fort Wadsworth. Likewise, Great Kills would offer new opportunities for nature study, environmental educational, and participatory natural stewardship programming.

Resource Management

Natural resource stewardship would be prioritized at the Staten Island districts. The NPS would focus resource protection efforts on improving beach/dune habitat at the unit and working with neighbors and partners to expand and care for the coastal stretch of protected wetlands and beach/dune habitat.

Historic preservation at Fort Wadsworth would be a management priority and preservation trainings and workshops would enable volunteers and partners to contribute to the preservation of Fort Tompkins and select Endicott/Taft-era batteries. In this alternative, more

Table 2-8. Staten Island Unit - Alternative C.

Desired Changes	Types of Change	Where Change May Occur
Programmatic and stewardship connections created to link Gateway sites, New York City parks, and neighborhoods	Δ New programs and stewardship opportunities	Δ Great Kills Δ Fort Wadsworth Δ Miller Field
Natural immersion opportunities are developed and promoted	Δ Create learning opportunities and services for activities such as kayaking and wildlife observation Stewardship Δ Formalize nature trails to bays and waterways for fshing, walking Δ Establish overlooks for outstanding/distance views of bays and ocean Δ More nature trail and nature observation facility development	Δ Great Kills Δ Fort Wadsworth Δ Miller Field
Environmental education	Δ Improve or develop places and facilities to learn about bay-related resources such as salt marsh, wetlands	Δ Unit-wide
Recreation improvements	Δ New picnic and open space area Δ Improved launching areas for human-powered boating Δ Trailheads and parking areas, orientation kiosk, trails and picnic areas	Δ Great Kills Δ Fort Wadsworth Δ Miller Field
Offer low impact camping opportunities	Δ Create low-impact camping areas and support services Δ Offer special camping programs in places like historic buildings or natural areas.	Δ Great Kills Δ Fort Wadsworth
Connect park sites through trails and paths	Δ Convert former roads into trails Δ Improve biking and walking infrastructure and circulation Δ Improve access and linkages to NYC Greenway	Δ Great Kills Δ Miller Field Δ Fort Wadsworth
Formal water trails established	Δ Establish new water trails connecting to NYC parks and other Gateway areas	Δ Great Kills Δ Fort Wadsworth Δ Miller Field
Expand access to ~~Jamaica Bay~~ New York and Great Kills Harbor and other waterways	Δ New boat sites, storage, shuttles, and equipment rental	Δ Great Kills Δ Fort Wadsworth

of Fort Tompkins would be opened, preserved, and interpreted. Also, interpretation of Fort Tompkins, Battery Weed, and the Endicott/Taft-era batteries would be enhanced through a Coastal Defense Trail. The trail would wind through and among the historic structures offering excellent views and interpretive media along the route.

The coastal defense structures at Fort Wadsworth would become a focal point for participatory stewardship and a learning laboratory for hands on historic preservation. Visitors would experience the history and discover the coastal defense structures through increased interpretive programming and expanded interpretive media.

Transportation

Similar to alternative B, improved public transportation and an expanded greenway, as well as, shuttles between the sites would make access more convenient. In addition, bike infrastructure would be developed throughout the unit, including a bike-sharing system, maps, and convenient bike parking, to encourage more bike use at the parks and provide convenient connections with other Staten Island trail systems.

Fort Wadsworth

Historic Zone

Fort Wadsworth would become a destination for interpretive experiences in a preserved historic setting. The cultural landscape surrounding the batteries and ruins would be preserved to a greater degree than in alternative B and more accurately refect the fort's periods of signifcance. The coastal defense structures at Fort Wadsworth would become a focal point for participatory stewardship and a learning laboratory for hands on historic preservation. Visitors would experience the history and discover the coastal defense structures through increased interpretive programming and expanded interpretive media. A new "Coastal Defense Trail" would be developed among the batteries and offer expanded interpretation and up close experiences of the coastal defense resources. Additional foot trails would also be re-established at Fort Tompkins.

Similar to alternative B, Battery Weed and Fort Tompkins would be preserved and open to more regular visitor use. However, in alternative C, NPS would increase the level of access to these structures and expand interpretive and education programming of the two fortifcations. Fort Tompkins would be rehabilitated to serve as a visitor facility that orients visitors, includes interpretive exhibits and hosts educational programs. The Battery Weed seawall would be repaired and fortifed to protect the resource from storm surges.

With the exception of the primary coastal defense structures (Weed and Tomkins) that are already interpreted, the following batteries would undergo minimal stabilization and would be featured interpretive stops along the Coastal Defense Trail: Duane, Caitlin, Torpedo, Bacon, Barbour. Some of these batteries would be made more visible by clearing vegetation from them. Those left covered in vegetation would be used to interpret the relationship between natural and cultural resources and to demonstrate how, overtime, some of the defense structures came to serve as habitat. In addition, overlooks would be developed on some of the batteries to facilitate, access, and frame cultural landscape vistas.

The cultural landscapes of Mont Sec and New York avenues would receive more extensive preservation treatments in alternative C and both avenues would be incorporated into the visitor experience of Fort Wadsworth through improved wayfnding signage and interpretation.

Recreation Zone

As in alternative B, visitor orientation within the entire park would be improved. NPS would establish multiple new contact stations in order to improve the sense of arrival and better orient visitors.

With improved signs and wayfnding, Fort Wadsworth would be more visible and clearly identifed as a park welcoming to visitors. The NPS would work with the NYCDPR to expand the greenway so that it links Fort Wadsworth, Miller Field, and Great Kills together. Carolina Street would be closed to cars and converted into a bike/pedestrian route. Multi-modal transportation systems including public transit, bike paths, and a shuttle would link Fort Wadsworth with the Staten Island Ferry. At Fort Wadsworth and the other Staten Island park sites, the NPS would work in cooperation with NYCDPR to develop bike-sharing stations. These rental opportunities along with improved wayfnding and signs would encourage an promote bike travel through and between the park units.

Existing recreational facilities would be expanded to accommodate greater recreational use. Existing camping facilities would be expanded and include campsites closer to the coastline.

Natural Zone

The beach/dune habitat along Fort Wadsworth's coastline would be protected and enhanced through park and volunteer stewardship projects. The NPS would build resilience by working with partners and volunteer stewards to restore dune habitat along Fort Wadsworth coastline.

Access to the water would be maintained and new opportunities for water-based recreation would be introduce. This would include to greater fshing access, a human-powered boat launch site and boat-based interpretive tours. From Fort Wadsworth, a water trail would lead out to an offshore dock positioned nearby Hoffman and Swinburne Islands for distant wildlife observation. The interpretive water trail would also link to launch sites at Miller Field and Great Kills Harbor.

The NPS and its partners would work together to offer guided boat tours to interpret Fort Wadsworth, other NPNYHC coastal defense resources and natural resources from the water.

Hoffman and Swinburne Islands

Hoffman and Swinburne islands would be managed for their natural and cultural resources and no visitor access would be permitted on either island. The island's wildlife and cultural resources could be viewed from the water. The wildlife on the islands and the islands' habitat value would be monitored and study (e.g. heron rookery and seal haul out).

~~Miller Field~~

~~Recreation Zone – Community Activity Subzone~~

Alternative C: Experiencing Preserved Places

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Management Zones

- Marine
- Recreation
- Active Beach Subzone
- Community Activity Subzone
- Natural
- Sensitive Resource Subzone
- Historic
- Ruins Subzone
- Developed

- GATE Legislative Boundary
- Existing Trail / Bike Path
- NYC / Other Federal Agency Land
- City / County / State Park Land
- NYC DPR Water

I-278
Staten Island
Expressway

Von Briesen Park

Battery
Weed

Fort Tompkins

Verrazano -
Narrows
Bridge

Hylan Blvd

Fort Wadsworth

Franklin D. Roosevelt Boardwalk and Beach

Hoffman Island

Hangar

Miller Field

Swinburne Island

Education
Field Station

Kills
Harbor

Lower New York Bay

Crookes
Point

Beach
Center

Great Kills Park

North

0 .5 Mile
.25 Mile

Miller Field would remain a vibrant center for community-based recreation tailored to youth and their families. Fields designed for a range of sports uses including soccer, softball and pee-wee leagues would be upgraded to better accommodate intensive use. In both alternatives, management of the ball felds and the sports leagues would be transferred from the NPS to another entity.

A multi-use Perimeter Trail would circumnavigate the entire park and connect the forest with the bay. Walkability throughout the park would be improved by expanding the width of multi-use paths and retroftting park roads to slow traffc and include sidewalks or designated bike/walk ways. An active nature-based recreation experience that would appeal to youth and their families (e.g. bike trails/facilities, play features, nature adventure zone) would be offered and complement the sports league use.

The visibility of the NPS would be increased at Miller Field through improved signs and wayfnding. The NPS would take advantage of the busy park to introduce more children and their families to the NPS, and Gateway's NPS outreach would target sports leagues and families and inform them about the other parks and experiences Gateway offers.

The NPS would work with partners to host concerts, performances, tournaments, and events on the feld. The community gardens would be expanded to accommodate more gardeners. Additionally, the picnic and group gathering around the contact station would be expanded and improved. The hangar area would be redeveloped as a community activity area and could include a picnic pavilion, trailhead, and community event space. The hangar would be stabilized and new use sought.

Ingress/egress circulation patterns, lot confgurations, and wayfnding would be modifed to address recurring congestion. Local transit access and bus connections to Staten Island Railway at New Dorp, Eltingville Transit Center, and Saint George/Staten Island Ferry Terminal would be promoted and the NPS would work with partners to develop more direct public transit routes that serve Miller Field. A bike-sharing terminal at Miller Field would encourage bike travel along the NYC Greenway up to Fort Wadsworth and the NPS would work with partners to establish a designated bike route to Great Kills.

Natural Resource Zone

A kayak launch site, kayak instructional zone, and boat rental concessionaire would be developed on Miller Field's coastline. The Miller Field launch site would be an access point to the buoyed interpretive water trail that extends from Fort Wadsworth to Great Kills Park. The dune habitat along Miller Field's shoreline would be protected and maintain. Control access with a well defned trail from the greenway and parking area to the water.

Developed Zone

The park housing on Miller Field and the Visitor Contact Station would be maintained. Location of maintenance and operations area will be identifed upon further study. Maintenance area will be located to complement recreational opportunities.

Great Kills Park

Natural Zone and Sensitive Resources Subzone

At Great Kills Park, the valuable natural resources including maritime forest and shrublands and over wash dunes and beaches would be protected and restored. More extensive habitat enhancement and restoration efforts would take place across the Great Kills park site than in alternative B. NPS would focus resource protection efforts on improving beach/dune habitat on the site and work with neighbors and partners to expand the stretch of protected wetlands and beach/dune habitat up Staten Island's coast. This wetland protection effort would include the reestablishment of saltmarsh. The former ball felds and model airplane would be removed and the area would be restored to restore maritime shrubs, forests, and wetlands as well as beach/dunes. Aggressive invasive species control would also be enacted throughout the Natural Zone and Sensitive Resource Subzones.

The park would also encourage more extensive study of geomorphology and beach erosion than in alternative B. NPS would work with neighbors and partners to implement solutions for improving resiliency of beach/dune habitat Great Kills and further east along Staten Island coastline.

The natural zone offers an abundance of opportunities for nature based recreation and environmental education programming. Within both the Natural Zone and the Sensitive Resources Subzone, volunteer stewards would be engaged in habitat restoration and monitoring projects.

The Great Kills Education Field Station would be enhanced to ~~include more programming and exhibits, an outlying~~ accommodate more programming and teaching aids, an outlying interpretive nature trail network and outdoor classrooms in order to better facilitate environmental education and feld learning.

Miles of soft-surface trail and associated nature observation facilities such as blinds, towers, and boardwalks would encourage nature study and self-guided exploration of the park's existing and restored natural environments.

New camping opportunities and overnight accommodations would be developed within the Natural Zone. There would be an emphasis on introductory and intergenerational programs that teach camping skills.

Recreation Zone and Active Beach Subzone

New and improved facilities would expand recreation opportunities at Great Kills Park. Water-based recreation would be expanded at the Great Kills Harbor and marina to support boating and fshing including instructional programming, equipment rental and guided tours.

The popular multi-use pathway would be maintained. Additionally, the multi-use path would connect with the soft-surface trails that traverse the Natural Zone.

The guarded swim beach, beach access, and the beach center would be maintained. Expanded shade and picnic facilities would be developed to complement the beach experience.

Accessing the park would be made more convenient by an NPS shuttle that links surrounding communities and park lands. In addition, the NPS would coordinate with partners to complete missing pieces of on- and off-street trails and bike routes for connecting Great Kills to Miller Field. Finally, improved bike infrastructure, including bike rentals, maps, wayfnding, and bike parking facilities, would encourage park access by bike.

Alternative Considered but Dismissed

Following the presentation of the alternatives to the public and partners in the summer of 2012 and the collection of public comments and partner feedback, the GMP team decided to eliminate what had been alternative D. Titled "Connecting Coastlines," the management concept for alternative D was as follows:

The broad themes of coastal ecology, coastal defense, and coastal recreation link the three park units and their varied resources together. In this alternative, the NPS and its partners emphasize water-based recreation, education, and interpretation and create a seamless coastal experience centered on beaches, marine habitats, and coastal defense resources and stories.

The decision to dismiss alternative D stemmed from a lack of public interest/support and redundancy in key elements. Gateway staff and park partners felt that there were not enough unique components of alternative D to distinguish it substantially from alternatives B and C. Although the alternative was dismissed, it should be noted that certain ideas from alternative D were incorporated into alternative B, including the following management and recreation emphases:

- Expansion and promotion of water-based recreation opportunities and city park connections including water trails, kayak rental, and training opportunities, and boat tours.

- Development of new orientation, programming, and access from water and increased waterborne transportation.

Environmentally Preferable Alternative

In accordance with the NPS NEPA Director's Order 12 Handbook, the NPS identifes the environmentally preferable alternative in its NEPA documents for public review and comment (NPS 2001, section 4.5 E[9]). The environmentally preferable alternative is the

alternative that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identifed upon consideration and weighing by the Responsible Offcial of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative (43 CFR 46.30).

The environmentally preferable alternative is identifed upon consideration and weighing by the Responsible Ofcial of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources.

Alternative C has been identifed as the environmentally preferable alternative based on the analysis of impacts, which identifed it as least damaging to the biological and physical environment and best at protecting and enhancing natural and cultural resources. Specifcs are outlined below.

Alternatives B and C both propose additional access and activities at many park sites, and this increase in use has the potential for damage to wildlife habitat—including that used by species of special concern—to vegetation, and to soils. However, each alternative also includes measures that would particularly enhance biological resources and that are absent from the no-action alternative. These measures include a commitment to using expanded partnerships with academics, agencies, private entities, and NGOs to jointly research the causes of loss of saltmarsh island habitat and how best to restore it and water quality in the Jamaica Bay; working with neighboring landowners to remove impediments to natural coastal sand transport processes; creating freshwater and saltwater wetlands and open water areas in conjunction with a new wetlands center; and holistically planning and implementing freshwater wetland restoration at multiple locations. Alternative B has substantially greater development of some park sites than alternative C for camping, trails, and visitor recreational facilities and amenities. Particularly at Sandy Hook, and to a lesser extent at Fort Tilden, current unique or undisturbed areas used by imperiled vegetation associations or plant or wildlife species of concern, or by many thousands of individual wildlife such as migrating birds, for example, could be affected by this development and by the presence of humans.

In addition to a smaller scope of development in alternative C, visitor use–related equipment or facilities would be sustainable and easy to remove following the summer season, restoring relatively undisturbed conditions for the remainder of the year. Alternative C also includes additional ~~closures~~ restrictions and protection of sensitive or unique habitat at Sandy Hook, ~~Breezy Point,~~ Plumb Beach, and Fort Tilden, including vegetative communities found only at these sites in the New York City or Monmouth County area, nesting by several species of shorebirds listed as federally or state endangered or threatened, vegetation associations considered globally imperiled, and important migratory bird resting and feeding habitat. ~~While alternative B opens Hoffman Island, Canarsie Pol, and Big Egg Island for day or overnight use, alternative C keeps these areas closed to visitor use. Each is used by birds for feeding, resting, or nesting; alternative C would therefore do a superior job of protecting, preserving, and enhancing this biological resource.~~

Both action alternatives are considerably more benefcial than no action (alternative A) for historic structures, historic districts and cultural landscapes, and museum collections. Reuse would not be nearly as extensive under the no-action alternative as for either action

alternative, and because reuse requires restoration of historic sites which in turn may contribute to historic districts, it has an important benefcial impact on cultural resources. Of the two action alternatives, alternative B offers the widest variety of potential adaptive reuses, particularly in the Sandy Hook Unit. Use of Fort Tilden and Fort Wadsworth in either alternative B or C would also help in stabilizing these districts. Formalizing current policies of allowing some batteries and other damaged or deteriorating structures to continue to decay by applying a Ruins Subzone would have the potential for adverse impacts in alternatives B and C. Historic resources affected are primarily associated with military history and the coastal defense of New York Harbor. Conversely, application of a Historic Zone would help in protecting and preserving cultural resources. This zone is slightly larger in alternative C than alternative B (and is not part of alternative A). Both action alternatives are equally benefcial in fnding a safe area to maintain the park's museum collections. The no-action alternative is environmentally preferable in protecting buried archeological resources, as development of trails, roads, visitor facilities, and other infrastructure is minimal. On balance, because activities in alternatives B and C are so similar, the application of a larger Historic Zone in alternative C makes it slightly environmentally preferable for cultural resources.

Consistency with NEPA

The NPS requirements for implementing NEPA include an analysis of how each alternative meets or achieves the purposes of NEPA, as stated in sections 101(b) and 102(1). Each alternative analyzed in a NEPA document must be assessed as to how it meets the following purposes:

1. Fulflls the responsibilities of each generation as trustee of the environment for succeeding generations

2. Ensures for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings

3. Attains the widest range of benefcial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences

4. Preserves important historic, cultural, and natural aspects of our national heritage and maintains, wherever possible, an environment that supports diversity and variety of individual choice
5. Achieves a balance between population and resource use that would permit high standards of living and a wide sharing of life's amenities

6. Enhances the quality of renewable resources and approaches the maximum attainable recycling of depletable resources

Alternative A: No Action

Alternative A would minimally meet the six purposes of NEPA. There would be no new sources of park operating funds, such as from friends groups, donations, or volunteers beyond what currently exists, making it increasingly diffcult for the declining numbers of park staff to meet the park's mission to manage the park leaving it unimpaired for the enjoyment of future generations (Purpose 1). The NPS would continue to have diffculty adequately protecting natural, scenic, and cultural resources due to limitations in the numbers of park staff, a major maintenance backlog, and an abundance of historic structures in poor condition (Purpose 4). The existing level of programming, activities, and enforcement would be maintained and used, with no construction of new facilities and the addition of only a few new programs, as funds allow (Purposes 2, 3, and 5). The park would not provide additional recreational facilities or recreational and educational programming requested by the public during GMP/EIS scoping (Purposes 2, 3, and 5). Existing resource management actions, particularly water quality monitoring, management planning to improve water quality in Jamaica Bay, and protection of coastal habitats, would continue as they are today, with long-term benefts continuing to be limited due to inadequate staffng and funding (Purpose 6).

Alternatives B and C

Both alternatives B and C would meet the six purposes of NEPA. New sources of funding would become available as the NPS works with its partners, substantially enhancing the park's ability to meet its mission and to support targeted resource protection goals (Purposes 1 through 6). With development of the Jamaica Bay Science and Resilience Institute and the resulting increase in partnerships, collaborations, and scientifc study focused on Gateway's natural resources, habitat conditions in Jamaica Bay and elsewhere in the park would be better understood and stewardship would become more effective (Purposes 4 and 6). Historic structures at Fort Wadsworth ~~(Fort Tompkins and Battery Weed),~~ Fort Tilden ~~(Battery Harris),~~ and Sandy Hook Proving Ground (Fort Hancock ~~and the Nike Missile site)~~ would be rehabilitated and leased where appropriate, enhancing their long-term protection and providing a moderate income stream to support their long-term maintenance (Purposes 4 and 5). Additionally, historic structures at Fort Wadsworth (Fort Tompkins and Battery Weed), Fort Tilden (Battery Harris) and Sandy Hook Proving Ground (Fort Hancock and the Nike Missile site) would undergo additional stabilization and rehabilitation and become visitor-ready and interpreted (Purpose 4). In both alternatives, the park would provide some additional recreational facilities and enhanced educational and interpretive programming as requested by the public during GMP/EIS scoping (Purposes 2, 3, and 5).

Partnerships with New York City in alternative B would greatly enhance the park's ability to meet its mission and to support targeted resource protection goals (Purposes 1 through 6). Also, in alternative B, Gateway would provide many more new recreational facilities, including a wetlands center at Floyd Bennett Field and a wide variety of recreational programming (e.g., camping, lessons, environmental education), which would exceed the improvements requested by the public during GMP/EIS scoping (Purposes 2, 3, and 5).

In alternative C, an emphasis on participatory stewardship, increased volunteer programming, and enhanced resource protection would enhance the park's ability to meet its mission and to support targeted resource protection goals (Purposes 1 through 6).

User Capacity Indicators and Standards

Introduction

User capacity is one statutory requirement for the GMP established in the 1978 National Parks and Recreation Act. The act called for the identifcation and implementation of commitments for visitor carrying capacities. The NPS GMP Sourcebook (2008b) explains that planners have found that "user capacity" is a more appropriate term than visitor carrying capacity because it conveys the concept that capacity is applicable to all park users, including local residents. The NPS defnes user capacity as the type and level of use that can be accommodated while sustaining the desired resource conditions, social conditions, and visitor experiences consistent with the purposes of the park. The approach to user capacity is now focused on measuring the success at achieving and maintaining desired resource conditions and visitor experiences as affected by people's use of the parks. The NPS does not solely track and control user numbers, but instead manages the levels, types, behaviors, and patterns of visitor use and other public uses as needed to control the condition of the resources and the quality of visitor experiences.

The GMP planning process requires the development of a monitoring system to test the efectiveness of the management actions taken by identifying indicators and standards that gauge when or if the desired conditions have been achieved.

The GMP planning process requires the development of a monitoring system to test the effectiveness of the management actions taken by identifying indicators and standards that gauge when or if the desired conditions have been achieved.

The foundations for making user capacity decisions in this GMP are the purpose, signifcance, special mandates, and management zones associated with the park. The purpose, signifcance, and special mandates defne why the park was established and identify the most important resources and values—including visitor opportunities—that are to be protected and provided. The management zones in each alternative describe the desired resource conditions and visitor experiences, including appropriate types of activities and general use levels, for different locations throughout Gateway. The zones, as applied in the alternatives, are consistent with, and help achieve, the specifc purpose, signifcance, and special mandates for each park. As part of the NPS commitment to the implementation of user capacity, park staff will use these directives to guide the types and levels of visitor use that will be accommodated while sustaining the quality of park resources and visitor experience consistent with the purposes of both parks.

In addition to these directives, in areas where use and past research and study have demonstrated a need, this GMP also includes specifc user capacity indicators and standards. Indicators and standards are measurable variables that will be monitored to track changes in

resource conditions and visitor experience. The indicators and standards help the NPS ensure that desired conditions are being attained, supporting the fulfllment of the legislative and policy mandates of the park.

User Capacity At Gateway

Gateway is a popular, heavily visited park located within a major metropolitan area with extensive and diverse visitor opportunities that are in high demand. Visitor use opportunities occur over a large land and water mass with many access points and use areas, which makes regulating use levels, activities, and patterns complex. While the park's natural resources have demonstrated an impressive degree of resiliency, the park contains habitats that are vulnerable to visitor use impacts.

Given these challenges and limited staff and budgets, user capacity management must be strategically implemented through the effcient use of staff time and funding, targeted focus on areas of most concern within the park, and creative approaches to monitoring and developing management strategies. For all areas of Gateway, the management zones provide the most important implementation commitment for user capacity, because they describe the desired resource conditions and visitor experiences—including appropriate types and levels of use, visitor services, and development—for all sites within the planning area. These management zones are consistent with and help achieve Gateway's purpose, signifcance, and special mandates.

In addition to the implementation commitments for the desired conditions (identifed in the zone descriptions) and based on some of the most pressing existing or potential use concerns at sites within Gateway, a set of resource and visitor experience indicators have been identifed for the park that may be monitored to assess visitor-related impacts on park resources and the quality of the visitor experience (see table 2-9). The priority resource indicators for Gateway are associated with the issues of habitat and wildlife disruption and wear on the park's cultural resources. The priority visitor experience indicators for Gateway are associated with the issues of crowding and congestion, condition of recreation sites, and satisfaction with visitor services and facilities. Please note that in order to measure some of the visitor experience standards, it will be necessary to institute a parkwide visitor survey or potentially modify an existing annual mail-in survey to include questions related to these visitor experience indicators and standards.

The fnal selection of any indicators and standards for monitoring purposes or the implementation of any management actions that affect use would comply with NEPA, the National Historic Preservation Act of 1966, and other laws, regulations, and policy, as needed.

Monitoring

Park staff will continue general monitoring of use levels and patterns throughout Gateway. In addition, park staff will monitor these user capacity indicators. The development of specifc monitoring protocols is left to a detailed monitoring plan, which is beyond the scope of the GMP/EIS. The rigor of monitoring the indicators (e.g., frequency of monitoring cycles,

Table 2-9. Park User Capacity Indicators and Standards.

Indicators	Assigned Zone/Specifc Areas	Standards
Visitor-related Resource Indicators		
Evidence of persistent and/or prohibited use of closed and/or restricted areas.	Δ Historic Zone Δ Natural Zone Δ Developed Zone Δ Recreation Zone	Δ Closure of existing informal, non-designated trails and unauthorized access points Δ Or conversion of informal trails to designated and managed trail Δ Proper signs and access enforcement Δ Signs, fencing, and other measures to prevent unauthorized access to cultural resources
Deterioration in the condition of existing trails (e.g., widening, increased erosion, trampling) and/or development of new, non-designated informal or "social" trails	Δ Natural Zone Δ Sensitive Resources Subzone Δ Recreation Zone Δ Historic Zone	Δ No substantial deterioration of existing, designated trail conditions in which severe erosion is obvious, bare soil is widespread in a widening tread and nearly complete loss of organic littler and/or vegetative cover Δ Zero tolerance for new, undesignated "social trails"
Number of times per day birds are fushed from the roost or nesting colony—applies to tern colonies, heron rookeries, and piping plover nesting areas	Δ Natural Zone Δ Sensitive Resources Subzone	Δ No more than two times in a 12-hour period
Degradation of the condition of marsh and shoreline habitat below baseline conditions	Δ Natural Zone Δ Sensitive Resources Subzone Δ Recreation Zone	Δ Proper signs and access enforcement Δ Removal of social trails and unauthorized access points along shorelines Δ No tolerance of boat landing on marsh islands or unauthorized access in closed areas Δ Enforcement of motorized boating speed limits
Deterioration in the condition of habitat within and immediately surrounding backcountry, beach, walk-in tent, and programmatic camping areas	Δ Natural Zone Δ Recreation Zone Δ Historic Zone	Δ Maintain at least 80% of campsites with no more than moderate vegetation loss and minimal signs of soil erosion and shoreline disturbance
Number of incidents of graffti and/or vandalism affecting park assets, including cultural resources	Δ All zones (with a focus on cultural resources within the Historic Zone)	Δ No more than one minor incident per month—minor is defned as repairable damage (e.g., new ink / paint graffti over paintable surface) Δ No major incidents—major is defned as irreparable damage resulting in major resource loss and signifcance recovery cost

Table 2-9. Park User Capacity Indicators and Standards (continued).

Indicators	Assigned Zone/Specifc Areas	Standards
Documented changes in condition of Band 1 and 2 cultural resources (including historic structures and cultural landscapes) from visitors and park management activities	Δ Historic Zone	Δ Visitor impacts do not exceed threshold of changing overall site condition to a lesser condition (e.g., good to fair, fair to poor) Δ No trampling of gardens and/or vegetation contributing to the signifcance of the cultural landscape Δ Visitor uses, including self-guided access, guided tours, programming, and events, do not threaten character-defning features
Visitor Experience Indicators		
For arrival via car, shuttle, and ferry: Approximate arrival experience time (from park entrance to arrival at a parking lot / unloading zone)	Δ All zones (with a focus on Recreation Zone because most parking lots and transportation infrastructure is within this zone)	Δ Maximum arrival time is 15–20 minutes per individual or group
Recreation site condition assessment: rating of good, fair, poor based on site size, ground cover loss, tree/ vegetation damage, amount of litter / human waste, and evidence of wildlife harassment	Δ Recreation Zone (including Community Activity and Active Beach Subzones) Δ Natural Zone Δ Historic Zone	Δ The condition of recreation sites will be maintained in "good" condition Δ Visitor impacts do not exceed threshold of changing overall recreation site condition to a lesser condition (e.g., good to fair, fair to poor)
Visitor satisfaction with the scale, location, and condition of visitor services and facilities as well as visitor comforts (using random survey instrument)	Δ Recreation Zone (including Community Activity and Active Beach Subzones) Δ Natural Zone	Δ Greater than 75% of all visitors surveyed report "high" levels of visitor comfort and satisfaction with the scale, location, and condition of visitor services and facilities
Visitor satisfaction with opportunities to experience open space and nature (using random survey instrument)	Δ Recreation Zone Δ Natural Zone	Δ Greater than 75% of all visitors surveyed report "high" levels of visitor satisfaction with access to natural areas and the shoreline, dark night skies, natural soundscapes, views, and/or direct sensory experiences with natural elements Δ Less than 10% of visitors reported problems with user conficts detracting from their experience of open space and nature
Visitor satisfaction with opportunities to experience historic settings (using random survey instrument)	Δ Recreation Zone Δ Historic Zone	Δ Greater than 75% of all visitors surveyed report "high" levels of visitor satisfaction with access to historic settings and opportunities to learn about coastal defense and maritime history at Gateway Δ Less than 10% of visitors reported problems with user conficts detracting from their experience of historic settings

amount of geographic area monitored) may vary considerably depending on how close existing conditions are to the standards. If the existing conditions are far from exceeding the standard, the rigor of monitoring may be less than if the existing conditions are close to or trending toward the standard.

The initial application of the indicators and standards will determine whether the indicators are accurately measuring the conditions of concern and if the standards truly represent the minimally acceptable condition of the indicator. Park staff may decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. If use levels and patterns change appreciably, the park may need to initiate additional monitoring of new indicators to ensure that desired conditions are protected. This iterative learning and refning process is the strength of the NPS user capacity management program, in that it can be adapted and improved as knowledge grows.

Mitigation Measures

As a part of the analysis of the GMP/EIS alternatives, mitigation measures that could further improve alternatives in protecting resources have been identifed and would be considered by the NPS for implementation as part of the selected GMP/EIS alternative. Although each alternative in the GMP/EIS was designed in part to offer this protection, mitigation measures can further reduce impacts or offer greater protection of resources or values. As is true of all NPS actions, implementing the selected GMP/EIS alternative must be done in a way that protects unimpaired the park's natural and cultural resources and the quality of the visitor experience under the NPS Organic Act. Mitigation can be helpful or even instrumental in ensuring that this happens. In addition, actions described generally in the GMP/EIS often require a more site-specifc environmental review under NEPA and other laws before they can be implemented. The mitigation measures described in table 2-10 are a starting point in developing design options for these actions. As an example, the implementation of a compliance monitoring program would be within the parameters of NEPA and National Historic Preservation Act compliance documents, USACE section 404 permits, etc. The compliance monitoring program would oversee these mitigation measures and would include reporting protocols.

While some of the measures in Table 2-10 are standardized actions or are required by law, others are options that the NPS would consider in its fnal decision making. These are distinguished by the use of "should" or "consider" or similar language indicating that they are discretionary.

As a part of the analysis of the GMP/EIS alternatives, mitigation measures that could further improve alternatives in protecting resources have been identifed and would be considered by the NPS for implementation as part of the selected GMP/EIS alternative.

Table 2-10. Mitigation Measures to be Considered and/or Included as part of Action Alternatives.

Impact Topic	Mitigation Measure
Air Quality	Δ If an anaerobic digester is built, consider housing it or otherwise fltering stack emissions to reduce methane.
Vegetation	Δ Site-specifc information on vegetation associations should be collected at Fort Tilden and Sandy Hook and used in siting camping and other recreation facilities. Δ Rare or imperiled vegetation associations should be fenced or otherwise protected from visitor use at Fort Tilden and Sandy Hook.
Wildlife	Δ Identify and consider imposing a buffer of approx. 300 feet around Hoffman Island and saltmarsh islands in Jamaica Bay to protect nesting wading birds, including herons, from visitors ~~both on foot and~~ in boats. Δ ~~Consider closing Hoffman Island, Canarsie Pol, and marsh islands where wading birds can or do nest in Jamaica Bay to visitors from March 15 to August 31.~~ Δ Consider limiting visitor access at Plumb Beach during new moon and full moon high tides during May and June to protect horseshoe crab spawning.
Species of Special Concern	Δ Identify and consider imposing a buffer around osprey nests that would be in force during the April through August nesting season to ensure continued nesting success despite more intense or concentrated visitor use. Δ Continue to close Breezy Point Tip, Sandy Hook north area, and portions of Sandy Hook beaches to visitor access to protect piping plover nesting mid-March through September 1. Δ Consider working with USACE to realign the navigation channel into Great Kills Harbor to prevent the loss of horseshoe crab habitat from dredging to maintain the channel. Δ Future implementation projects resulting in site specifc plans, such as expanded camping and transportation infrastructure, would adhere to conservation measures for threatened and endangered species. Camp sites would be appropriately sited to avoid impacts to threatened and endangered species. Access and trails to/from camp site areas would be defned, controlled, and signed, to limit disturbance to threatened and endangered species and other resources.

Table 2-10. Mitigation Measures to be Considered and/or Included as part of Action Alternatives (continued).

Impact Topic	Mitigation Measure
Cultural Resources	Δ Continue to complete research, risk assessments and inventories for park historic resources including archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections to better understand and manage the resources. Continue to complete necessary National Register evaluations and documentation. Incorporate the results of these efforts into the park's resource stewardship strategy and site-specifc planning and compliance documents. Continue to manage cultural resources following federal regulations and NPS guidelines and policy, such as Director's Order 24: NPS Museum Collections Management, Director's Order 28: Cultural Resource Management, and NPS 28A: Cultural Resource Management Guideline (NPS 2008, 1998a, 1998c), and the Secretary of the Interior's Standards for the Treatment of Historic Properties (NPS 1992). Δ Where demolition or neglect of a historic property is proposed, the adverse effects will be mitigated through a variety of possible measures including (but limited to) graphic and photographic documentation, Historic American Buildings Survey/Historic American Engineering Record/Historic American Landscape Survey (HABS/HAER/HALS) documentation, and/or the Secretary's Standards and Guidelines for Historical and Archaeological Documentation. The level of this documentation, which includes photography, archeological data recovery, and/or a narrative history, would depend on signifcance (national, state, or local) and individual attributes (an individually signifcant structure, individual elements of a cultural landscape, etc.) and be determined through the ~~section~~ Section 106 process. When demolition of a historic structure is proposed, and following thorough documentation, architectural elements and objects may be salvaged for reuse in rehabilitating similar structures or they may be added to the park's museum collection. Demolished resources may also be incorporated into interpretive displays. Δ Through the park's interpretive programs, visitors will be encouraged to respect the park's coastal defense and maritime resources and to leave undisturbed any closed and/or inadvertently encountered historic and/or cultural resources. Δ In the event of new cultural resource discoveries made during the implementation of the GMP, the park will initiate consultation with the appropriate SHPO in compliance with ~~section~~ Section 106 of the National Historic Preservation Act. Δ Should human remains or funerary or sacred objects be encountered, work will immediately cease and the park staff will notify and consult with appropriate American Indian Tribes as required under the Native American Graves Protection and Repatriation Act of 1990 (NPS 2003c, 51–52). Δ Unless otherwise stated, the Secretary of the Interior's Standards (NPS 1992) will guide work affecting any historic properties. Δ Where they exist (also see the "Affected Environment" chapter), cultural landscape reports will be used to provide guidance for work in historic districts / cultural landscapes. These reports contain treatment guidelines for all aspects of the cultural landscape, including spatial organization, natural systems and features, land use, circulation, topography, buildings and structures, vegetation, and small-scale features. Δ When historic districts and/or structures are left unmanaged and are expected to deteriorate and decay, the appropriate level of documentation will be prepared and consultation conducted as set forth in ~~section~~ Section 106 of the National Historic Preservation Act.

Table 2-10. Mitigation Measures to be Considered and/or Included as part of Action Alternatives (continued).

Impact Topic	Mitigation Measure
Visitor Safety and Visitor Experiences	Δ Visitor safety concerns would be integrated into NPS interpretive and educational programs. Directional signs would continue to orient visitors, and education programs would continue to promote understanding among visitors. Δ Measures to reduce adverse effects of construction and building rehabilitation on visitor safety and experience would be implemented, including project scheduling, a traffc control plan, and best management practices. Δ An accessibility study will be conducted to understand barriers to park programs and facilities. Based on this study, a strategy will be implemented to provide the maximum level of accessibility. Δ "Managed ruins" sites will be fenced off, signposted, and or/obscured from view to reduce the temptation for unsanctioned and unsafe access.
Soundscapes	Δ Facilities would be located and designed to minimize objectionable noise. Δ Standard noise abatement measures would be followed during construction, including a schedule that minimizes impacts on adjacent noise-sensitive resources, the use of the best available noise control techniques wherever feasible, the use of hydraulically or electrically powered tools when feasible, and the location of stationary noise sources as far from sensitive resources as possible. Δ Options to reduce the sounds of maintenance equipment will be explored.
Visual Quality / Scenic Resources	Δ Where appropriate, facilities such as trails and fences would be used to route people away from sensitive natural and cultural resources while still allowing access to important viewpoints. Δ Facilities would be designed, sited, and constructed to avoid or minimize visual intrusion into the natural environment or cultural landscapes. Δ Vegetation screening would be provided, where appropriate.
Socioeconomic Environment	Δ During the future planning and implementation of the approved management plan for the park, NPS staff would work with local communities, New York City, and Monmouth County to further identify potential impacts and mitigation measures that would best serve the interests and concerns of both the NPS and the local communities. Δ Partnerships would be pursued to improve the quality and diversity of community amenities and services.
Transportation	Δ When the parking lots at Jamaica Bay Wildlife Refuge, Miller Field, or other park sites where space is often inadequate fll, redirecting traffc elsewhere would avoid exceeding the site's carrying capacity, as directed by NPS Management Policies 2006 (NPS 2006a). Δ Transportation infrastructure projects would be sited in areas, to the greatest extent possible, that were previously disturbed, to minimize impacts to resources. Trails would be defned, controlled, and appropriately signed to lead people away from threatened and endangered species locations. The initial proposed infrastructure options (ferry, shuttle, multi-use pathways), would require further analysis, site planning, consultation and compliance.

Cost Summary of the Alternatives

The future costs of implementing the alternatives were considered as part of the planning process. Future costs would encompass the design, construction, rehabilitation, or adaptive use of historic structures and landscapes, natural areas, visitor orientation, recreation and education facilities, parking areas, museum collection facility, maintenance areas, and other visitor services. In estimating the costs of the alternatives, different types of costs are taken into account, including one-time capital and annual operating costs.

Annual Operating Costs and Staff Levels

Annual operating costs (ONPS) are the total costs per year for maintenance and operations associated with each alternative, including utilities, supplies, staff salaries and benefts, leasing, and other materials. For alternative A, the park's current annual operating costs are $23,758,000. The operating costs for alternatives B and C would remain similar to alternative A and adjusted yearly as part of the federal budget process.

Staffng levels would be consistent for alternatives A, B and C. There are currently 295 FTEs authorized for the park. The staffng fgure (total number of FTE employees) is the number of person-years of staff required to provide visitor services, protect resources, maintain the assets of the park, and generally support park operations. The FTE number indicates ONPS-funded NPS staff only, not volunteer positions or positions funded by partners. FTE salaries and benefts are included in the annual operating costs. While the FTE number would remain the same for each alternative, the types and numbers of positions for maintenance, resource management, visitor services and other park functions would likely change by alternative.

One-time Capital Costs

The presentation of capital costs in a general management plan is intended for alternatives comparison purposes only. This plan, however, does not present estimated capital costs for the alternatives beyond a broad conceptual range of $100M to $300M due to the degree of uncertainty in the details required for developing estimates. The costs are not appropriate for budgeting purposes, although they do indicate the level of NPS investment that would be needed to implement the alternatives, and to allow comparison of the costs for each alternative.

A number of alternative actions will require major partner contributions and/or cooperation by other entities in order to accomplish those actions. These actions are considered less certain, and not enough details are known at this time to estimate costs. In addition, implementation planning for many of the proposals in the action alternatives would not proceed until the completion of Hurricane Sandy Recovery projects. The work being undertaken in recovery projects will establish a new baseline for site planning for capital projects proposed in this plan, and cost estimates at this time would be highly conjectural. Actual costs would be determined at a later date and would take into consideration the design of facilities, identifcation of detailed resource protection needs, and contributions by non-NPS partners.

Future Planning Studies and Implementation Plans

The need for additional studies and implementation plans was identifed during the planning process. The studies and plans identifed in Table 2-11 are the highest priority for implementation of the preferred alternative. The NPS would develop these plans and studies in coordination with stakeholders, academic institutions, and local governments, and state and other federal agencies.

Table 2-11. Future Planning Studies and Implementation Plans.

Type of Plan or Study	Purpose of Plan or Study
Archeological Coastal Resources Management Plan	Inventory and document threatened archeological resources in coastal areas and develop a management strategy for responding to climate change impacts.
Climate Change Plan	Provide a framework for incorporating technical data related to climate change impacts into natural and cultural resources management and visitor experience and facility planning.
Green Parks Plan	Develop park strategy for water and energy conservation, alternative energy development, waste stream reduction and green products purchasing. Update information from 1993 Green House Gas Inventory. Implementation strategy for energy conservation measures identifed in 2010 energy audit, including completing metering of individual buildings to tract energy usage of structures.
Buildings Sustainability Plan	Develop a park-specifc sustainability plan that supports the park purpose, integrates with park strategic documents, ensures that appropriate documentation is completed, and contributes to the overall regional sustainable buildings targets and objectives.
Jamaica Bay Freshwater Wetlands Study	Conduct a system-wide study of freshwater wetlands in Jamaica Bay to understand the relationship of future restoration projects and potential future salt water intrusion.
Marine and Estuarine Resources Management Plan	Identify the conditions and actions necessary to improve the park's management of fsheries and shellfsheries, submerged aquatic vegetation, and marine species.
Floyd Bennett Field Camping Plan/Environmental Assessment	Develop a camping plan including site-specifc design of multiple sites and supporting facilities.

Table 2-12. Summary of the Impacts by Alternative.

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Soils and Geology			
Physical character of soils	Adverse from compaction	Additional adverse impact from increased visitor use, facilities	Slightly less adverse than B because of fewer facilities, visitors
Availability of soils/ erosion	Benefcial from beach nourishment	Adverse from excavation, grading for visitor facilities where natural soils exist	Slightly less adverse than B because of fewer facilities
Natural offshore sand transport	Adverse from interruptions of sand transport	Signifcant benefcial impacts from possible removal of impediments	Same as B
Natural soils	Adverse from unnatural fll, rubble at many sites	Possible signifcant beneft from created wetlands	Same as B
Air Quality			
Mobile emissions	Adverse from cars, buses at park and in region of air basin	Substantial benefcial impact from increase in alternative transportation, public transportation options	Same as B
Stationary emissions	Adverse from power generation and other sources upwind of park and park operations	Benefcial from increasingly sustainable practices; short term adverse from construction	Slightly less adverse because less construction than B
Greenhouse gases	Adverse from park operations, but benefcial from tree planting	Benefcial from additional sustainable park operation practices, tree planting	Same as B
Water Resources			
Jamaica Bay water quality and hydrology	Signifcant benefts from collaborative efforts to improve	Additional signifcant benefts from holistic planning and expanded partnership, scope of research and application of fndings to restore water quality and hydrology	Same as B
Infltration	Adverse from paved areas and facilities; benefcial from maintained open spaces	Localized adverse impacts at several park sites from increased development, hardening.	Slightly less adverse because less construction than B
Open water habitat	N/A	Possible signifcant benefts from creating open freshwater and marine habitat in the park	Slightly more benefcial as area of created open water habitats would be expanded
Wetlands and Floodplains			
Risk of damage from coastal fooding	Localized benefts from beach nourishment and dune stabilizing efforts	Potentially signifcant adverse impacts from rebuilding or rehabilitating coastal structures Potentially signifcant benefts from increased efforts to stabilize dunes, create a positive sediment budget	Same as B

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Wetland resource conditions	Signifcant benefts from collaborative efforts to improve water quality in Jamaica Bay Substantial benefts from invasive species removal in wetlands	Additional signifcant benefts from holistic planning and expanded partnership, scope of research and application of fndings to restore water quality Possible localized signifcant benefts from increased focus on invasive species removal in wetlands	Same as B
Saltmarsh wetland habitat	Signifcant benefts from collaborative efforts to increase saltmarsh Slight beneft from leaving West Pond breached	Additional signifcant benefts from holistic planning and expanded partnership, scope of research, and application of fndings to increase saltmarsh Signifcant benefts from establishing a reconnection between Jamaica Bay and former saltmarsh at Floyd Bennett Field	Slightly more benefcial as area of saltmarsh at Floyd Bennett Field larger than in B
Freshwater wetland habitat		Signifcant benefts from holistic planning to create freshwater wetlands, including at West Pond Signifcant benefts from creating freshwater wetlands at Floyd Bennett Field	Slightly more benefcial as area of constructed freshwater wetlands at Floyd Bennett Field larger than in B
Marine Resources			
Marine borrow pits for sand used to nourish park sites	Adverse impacts to marine life at borrow sites	Same as A	Same as A
Marine and intertidal habitat at park	Benefts by adding habitat from beach nourishment Ongoing adverse impacts from impediments to natural sand transport processes	Adverse impacts from increases in visitor use and development Signifcant benefts by increasing extent of beach and dune habitat if sand transport processes restored Beneft from restored mudfat, intertidal habitat from increased collaboration to restore Jamaica Bay	Slightly less adverse impacts from less visitor related use and development Same as B for restoration of sand, dune, mudfat, and intertidal habitat
Marine, beach, and dune systems	Adverse impacts – Currently missing essential components and degraded at many park sites	Signifcant beneft from possibly restoring essential element of system if natural sand transport returned	Same as B

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Vegetation			
Trampling of vegetation	Adverse impacts from off-trail use, horse use, visitor use at beaches and dunes Benefits from maintaining undisturbed and protected areas, including for rare vegetation associations	Localized adverse impacts from increased amenities and visitors Continued benefits by maintaining undisturbed areas where rare vegetation exists	Slightly less adverse impacts from lower levels of increased facilities and visitor use Greater benefits by restricting visitor access for unique vegetation at several park sites
Habitat restoration	Benefits from planting at many park sites, including Pennsylvania and Fountain Avenue park sites, Crooke's Point, Fort Tilden Benefits from invasive species removal Adverse impacts from impediments to natural sand transport causing habitat loss, erosion	Increased benefits from additional efforts to control erosion, remove invasives, and plant native species Possible signifcant benefits for mudfat, intertidal, and dune vegetation from restoring natural sand transport	Same as B
Restoration of saltmarsh vegetation	Benefits from leaving West Pond breached Signifcant benefits from partnership restoration of Jamaica Bay saltmarsh	Localized short-term adverse impact from restoring West Pond Signifcant benefits from increased collaborative efforts to restore saltmarsh at Jamaica Bay Signifcant benefits from restoring connection between Jamaica Bay and Floyd Bennett Field	Same as B
Restoration of freshwater wetland vegetation	Adverse impacts from losing freshwater wetlands at West Pond	Signifcant benefits from holistic planning and creation of freshwater wetlands across park sites Signifcant benefits from creating freshwater wetlands at Floyd Bennett Field	Same as B
Wildlife			
Human disturbance	Adverse impacts from visitor use disturbing wildlife Adverse impacts from presence of humans keeping wildlife from using otherwise suitable habitat Benefits from keeping some areas closed to visitors	Increasing adverse impacts from increased visitor use from disturbance and displacement ~~Possible signifcant adverse impacts on nesting wading birds from allowing visitation at some Jamaica Bay Islands and Hoffman Island~~ Adverse impacts from night use Adverse impacts from loss of habitat due to development	Similar impacts from disturbance No visitation on islands, same as alternative A Less adverse impacts than B from night use (less camping) Less adverse impacts than B from development Benefits from additional closures to visitors where wildlife is sensitive

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Wildlife habitat	Benefts from maintaining grassland habitat by mowing Benefts by improving habitat conditions through invasive species removal Possible signifcant adverse impact from keeping West Pond breached as freshwater habitat is rare Possible signifcant benefts from collaborative efforts to restore Jamaica Bay saltmarsh habitat	Benefts by improving habitat with increased erosion control, wetland protection, and invasive species removal Possible signifcant benefts for freshwater wetland species from holistic planning to create wetlands at several park sites Signifcant benefts from increased collaborative research and stewardship of Jamaica Bay saltmarsh habitat Signifcant benefts from creation of freshwater and saltmarsh habitat at Floyd Bennett Field Localized benefts to intertidal wildlife from restored natural sand transport if it occurs	Same as B
Species of Special Concern			
Trampling listed plants	Adverse impacts from visitor use Benefts from fencing and signs	Adverse impacts increased from increased visitor use	Same as B
Human or other disturbance	Adverse impacts from visitor use Potential signifcant benefts for shorebirds, terrapins, colonial nesting wading birds from fencing and signs, buffers, education, predator management, and/or closures	Adverse impacts increased from increased visitor use, with harassment and signifcant impacts possible Continued restrictions would provide potential signifcant benefts ~~Possible signifcant adverse impacts from disturbance of state-listed nesting wading birds if islands open to visitors~~ No visitors to islands, with benefcial impacts the same as in alternative A as a result	Similar to B, although alternative C anticipates additional closures and fewer visitor amenities with fewer areas of disturbance No visitors to islands, with benefcial impacts the same as in alternative A as a result
Habitat improvement, loss or gain	Benefit for horseshoe crabs, piping plovers, and other beach wildlife from sand nourishment Adverse impacts from loss of otherwise suitable habitat related to disturbance	Increased potential for adverse impacts from habitat lost to disturbance or development that is otherwise suitable, including at Sandy Hook Signifcant benefts from creating saltmarsh habitat through collaboration at Jamaica Bay or reestablishing a connection at Floyd Bennett Field Substantial benefts from possible restoration of natural sand transport processes	Similar to B, although less habitat lost to development and more saltmarsh at Floyd Bennett Field created

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Cultural Resources – Historic Districts and Historic Structures			
Historic Districts containing Fundamental Resources	Benefts from maintenance, stabilization and preservation of some historic structures (coastal defense and marine resources) within Fort Hancock and Sandy Hook Proving Ground and Fort Wadsworth Signifcant adverse impacts from lack of maintenance for some historic structures (batteries and/or Nike Missile sites) at Fort Hancock and Sandy Hook Proving Ground, Fort Tilden, Fort Wadsworth)	Benefts to Fort Hancock and Sandy Hook Proving Ground, Fort Tilden and Fort Wadsworth from stabilization, rehabilitation/re-use, preservation, interpretation of some coastal defense and maritime resources; protection of individual resources designated as part of the Historic Zone; and protection of some historic structures from threats of future storm surges/fooding. Signifcant adverse impacts from loss of individual fundamental resources designated as part of the Ruins sub-zone (less severe than under alternative A).	Similar to alternative B
Other Historic Districts	Benefcial impacts from continued rehabilitation of historic structures and re-establishment of cultural landscape vegetation at Floyd Bennett Field.	Benefts from preservation and interpretation of the cultural landscape at Floyd Bennett Field Historic District; appropriate improvements to park facilities at Jacob Riis Park Historic District; and stabilization of historic structures at Miller Army Airfeld Historic District, Breezy Point Surf Club Historic District, Silver Gull Beach Club Historic District and Far Rockaway Coast Guard Historic District Adverse impacts possible from outcome of converted structures in historic districts (Floyd Bennett Field) Signifcant adverse impacts to historic districts from application of Ruins Subzone (Floyd Bennett Field Historic District, Jacob Riis Park Historic District, Far Rockaway Coast Guard Historic District)	Benefts from preservation of the cultural landscape and adaptive re-use of structures at Floyd Bennett Field Historic District,(to a greater degree than alternative B); otherwise, same as alternative B. Signifcant adverse impacts to districts from application of Ruins Subzone similar to alternative B
Historic structures	Signifcant adverse impacts from lack of maintenance of many coastal defense resources (batteries) and other historic structures	Benefcial impacts from maintaining, stabilizing, restoring, and adaptive reuse of prioritized structures noted above in fundamental resources and other historic districts Adverse impacts from possible inappropriate conversion of historic structures and loss of historic structures in Ruins Subzone as noted above in Fundamental Resources and Other Historic Districts	Benefcial impacts similar to alternative B. Adverse impacts from loss of historic structures in Ruins Subzone as noted above in Fundamental Resources and Other Historic Districts

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Cultural Resources – Archeological Resources			
Ground disturbance from walking or similar uses	Benefcial impacts from management of Hoffman and Swinburne Islands as natural areas (no park visitors)	Benefits related to visitor restrictions (established trails) on Swinburne and Hoffman Island ~~(fewer benefts than under alternatives A or C)~~	Benefcial impacts from management of Hoffman and Swinburne Islands as natural areas--no park visitors (similar to alternative A)
Ground disturbance from excavation, grading and/or flling	N/A	Adverse impacts from grading, excavating, flling associated with construction of visitor amenities/facilities and O&M facilities; impervious surface removal; rebuilding of structures lost/ damaged in Hurricane Sandy; landscape modifcations to protect some historic structures from threats of future storm surges/fooding (increased adverse impacts than under alternative A)	Similar to alternative B
Ground disturbance from natural resources management actions	Adverse small-scale impacts from invasive species removal or tree planting, environmental restoration possible	Increased adverse impacts possible with greater efforts with invasive species removal, tree planting, wetland enhancement/creation, etc. (greater impacts than under alternative A) Adverse impact to submerged archeological resources from off-shore beach nourishment activities possible (greater impacts than under alternative A)	Similar to alternative B
Management strategies	Adverse impacts to archeological resources associated with deteriorating/decaying historic structures possible	Benefits related to preservation of archeological resources--primarily left intact and undisturbed (greater benefts than under alternative A) Adverse impacts to archeological resources associated with deteriorating/ decaying historic structures within the Ruins Subzone possible (effects less intense than under alternative A)	Similar to alternative B

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Cultural Resources – Museum Collections			
Collection security and safety	Adverse impacts from substandard conditions	Benefcial impact from locating and moving collection to a suitable and suffcient archival facility	Same as B
Social and Economic Environment			
Use of park for enjoyment and recreation	Social benefts for community and other visitors	Increased benefts from increased access to Gateway and between park sites	Same as B
Visitor spending in community	Benefcial impacts for community from purchase of goods and services	Increased visitor numbers would result in increased spending and community economic benefts	Benefts would be similar to but less than in B because of fewer expected visitors
Jobs created	Benefts from park and concessioner related jobs	Increased facilities and opportunities for recreation may increase jobs with benefts for employment	Benefts would be similar to but less than in B because of fewer visitor facilities
Transportation			
Parking and traffc	Adverse impacts from insuffcient parking at Sandy Hook and other sites Adverse impacts from congestion when sites reach capacity	Benefts from building new or redesigning existing park lots and providing non-car options Benefit possible if park chooses to redirect traffc away from flled lots	Same as B
Public transportation	Adverse impacts from few public transportation options to access park	Possibly signifcant benefts from transportation hubs and multiple public transportation options, including new buses, shuttles and ferries	Same as B
Access between sites	Adverse impacts from few signs or other means of locating and traveling between park sites	Benefts from wayfnding and hubs with location information Benefts from creating paths between park sites, and between neighborhoods and park sites	Same as B
Alternative transportation	Adverse impacts from inadequate bike lanes, footpaths, or water access ways (blueways)	Possible signifcant benefts from increasing bike lanes, footpaths, and blueway options	Same as B

Table 2-12. Summary of the Impacts by Alternative (continued).

	Impacts under Alternative A	Impacts under Alternative B	Impacts under Alternative C
Park Management, Operations, and Facilities			
Facility maintenance and condition	Signifcant adverse impacts on park facilities because of inadequate budget to maintain all buildings and facilities; backlog and deterioration would continue to increase Short-term benefts from using repair money from Hurricane Sandy	Signifcant benefts from prioritizing key facilities for maintenance and allowing others to degrade; reduction in deferred maintenance Signifcant benefts possible if revenue-generating programming implemented	Same as B Signifcant benefts possible if preservation partners assist with rehabilitation of structures
Staff and budget	Signifcant adverse impact on park staff and budget from inadequate funds to maintain facilities	Adverse impacts from increased need for visitor programming and management, especially if funding inadequate to ensure staff levels Signifcant benefts possible from co-management with partner agencies on both staffng and budget, especially if revenue-generating programming implemented	Same as B Signifcant benefts possible from co-management with partner agencies to eliminate overlap and provide additional staff and budget
Energy effciency/ resource conservation	Benefts from ongoing efforts to adopt LEED standards, reuse existing structures, increase fuel effciency of feet, and provide alternative transportation for visitors	Signifcant benefts on park objectives and budget from increased efforts to incorporate sustainability into operations	Same as B
Operational effciency	NPS staff, budget are tasked with all aspects of management and operations	Signifcant benefts in improved operational effciency from partnering with New York City to eliminate duplicative programming and management	Same as B