

RECORD OF DECISION
FIRE ISLAND WILDERNESS BREACH MANAGEMENT PLAN FOR
Fire Island National Seashore, New York

INTRODUCTION

The Department of the Interior, National Park Service (NPS), has prepared this Record of Decision (ROD) for the *Fire Island Wilderness Breach Management Plan and Final Environmental Impact Statement*, May 2017 (final Breach Plan/EIS) for Fire Island National Seashore (the Seashore). This ROD identifies the decision/selected action, including mitigation measures; describes other alternatives analyzed; identifies the environmentally preferable alternative; and includes a brief description of the rationale for the decision reached. A non-impairment determination for the selected action is attached to this ROD.

BACKGROUND

In October, 2012, as a result of Hurricane Sandy, a breach was created in the barrier island within the Otis Pike Fire Island High Dune Wilderness (Fire Island Wilderness) which is part of the Fire Island National Seashore (the Seashore). The only guidance to address breaches along coastal Long Island at that time was a Breach Contingency Plan prepared by the U.S. Army Corps of Engineers in 1996. The Breach Contingency Plan does not adequately address management of breaches in the Fire Island Wilderness. The National Park Service must manage federal wilderness to preserve wilderness character in compliance with the *Wilderness Act of 1964* (Public Law 88-577); the *Otis Pike Fire Island High Dune Wilderness Act* (Public Law 96-585), the legislation that established the Fire Island Wilderness; and the *2016 Wilderness Stewardship Plan and Backcountry Camping Policy, Otis Pike Fire Island High Dune Wilderness*, which governs NPS actions taken in the Fire Island Wilderness.

To assist in making a decision on how to manage the wilderness breach, the National Park Service prepared the draft *Fire Island Wilderness Breach Management Plan and Environmental Impact Statement*, October 2016 (draft Breach Plan/EIS). The draft Breach Plan/EIS evaluated three alternatives: Alternative 1, Closure Using Mechanical Processes; Alternative 2, Status Determined Entirely by Natural Processes (no-action alternative); and Alternative 3, No Human Intervention Unless Established Criteria Are Exceeded (proposed action and the NPS preferred alternative). The draft Breach Plan/EIS was available for public review and comment from October 27 through December 12, 2016.

The final *Fire Island Wilderness Breach Management Plan and Environmental Impact Statement* (final Breach Plan/EIS) was released on December 22, 2017 for a 30-day no action period that ended on January 22, 2018. As in the draft Breach Plan/EIS, the final Breach Plan/EIS identified Alternative 3, No Human Intervention Unless Established Criteria Are Exceeded, as the NPS preferred alternative. However, the following clarifications were added to the preferred alternative as a result of public and agency comments on the draft Breach Plan/EIS:

- A clearer explanation that the criteria (described in the selected action below) are not triggers for closure; rather, they are indicators that the National Park Service needs to increase monitoring to determine if the conditions are creating an increased risk to life and/or property; and
- An additional criterion for monitoring water levels from tide gauges to examine changes in the tidal prism was added.

DECISION (SELECTED ACTION)

The National Park Service has selected Alternative 3, No Human Intervention Unless Established Criteria Are Exceeded, for implementation as the final Wilderness Breach Management Plan for Fire Island National Seashore. The main points of the selected action are summarized below. The complete description of Alternative 3 may be found in chapter 2 of the final Breach Plan/EIS. Implementation of the selected action will begin following an announcement of the availability of the signed ROD.

Summary of the Selected Action

Under the selected action, the evolution, growth, and/or closure of the breach will be determined by natural barrier island processes, and human intervention to close the breach will occur only “to prevent loss of life, flooding, and other severe economic and physical damage to the Great South Bay and surrounding areas.”

The National Park Service will continue to monitor the breach using established methods that staff and scientists have used since 2012. Monitoring will be guided by three criteria that serve as indicators to alert Seashore staff to changes in the breach that could elevate the risk of severe storm damage in the form of loss of life, flooding, and other severe economic and physical damage, which could lead to a decision to close the breach.

- **Criterion 1: Geologic Controls.** As described on page 27 of the final Breach Plan/EIS, erosion-resistant clay to the east and west of the breach serve as geologic controls for migration of the breach. There are no known erosion-resistant materials to control breach migration beyond those. If the breach migrates beyond these geologic controls, growth of the breach will be less predictable.
- **Criterion 2: Cross-Sectional Area.** The cross-sectional area of the breach affects the volume of water moving in and out of the bay. Currently, the breach has reached a dynamic equilibrium in which the cross-sectional area has fluctuated between 300 and 600 square meters. A cross-sectional area within or below this range represents a condition in which the effects of the breach are understood. An increase in cross-sectional area above this range will indicate breach growth and a condition in which the evolution of the breach is less predictable and impacts to the surrounding areas may change.

- **Criterion 3: Water Level as Measured by Tide Gauges.** Data from tide gauges in Great South Bay, as reported by the state in annual reports, will be reviewed to identify changes in the tidal prism, which could indicate a change in the breach conditions. Changes in water level heights, seasonal changes, and changes in variability at Bellport compared to the rest of the Great South Bay, specifically an increase in the water level, will serve as an indicator of a potential change in the conditions of the breach that are affecting the surrounding areas.

Annual Breach Condition Evaluation. Under the selected action, on-going long-term monitoring will be conducted to evaluate if the changes in breach conditions alter potential flood risks. Monitoring methods to determine the cross-sectional area of the breach include monitoring the breach shoreline, bathymetric surveys, and monitoring tide gauge data. The location of the breach will be monitored monthly; the cross-sectional area will be monitored at least once per year, unless events such as a storm or review of data indicate a need for more frequent monitoring; and tide gauge data will be reviewed annually. These data will be used to prepare an annual breach monitoring report.

If any of the criteria are exceeded, this will initiate additional monitoring to evaluate if the breach poses a threat to life and/or property. The Seashore will expand the monitoring program and will work with other agencies and scientists to evaluate available information to determine the effects of a growing breach and the appropriate next steps. Expanding the monitoring program could include more frequent data collection in support of the three criteria described above and expert analyses of those data. The National Park Service will consider the threat of harm to park resources and values and the level of scientific uncertainty regarding flood risk. The National Park Service will make the decision whether to mechanically close the breach if the additional monitoring of breach conditions determines there is increased risk to life or property that is a direct result of the breach.

The criteria described above will be refined as necessary as understanding improves of the duration of change, rate of change, and the size of the breach. New research questions and scientific methods may also evolve and be added to monitoring protocol, providing new data for the Seashore to help understand the evolution and migration of the wilderness breach. An increase in cross-sectional area or migration of the breach beyond the erosion-resistant clay, for example, will indicate the need to expand the monitoring program and consider additional information about the conditions of Great South Bay and surrounding areas. Similarly, a change in criterion 3, water level as measured by tide gauges, will indicate the need to understand the cause of the change and expansion of the monitoring program.

The Seashore will continue to engage, at least quarterly, with local, state, and federal agency partners to share monitoring updates and solicit input from these partners which include the New York Department of Environmental Conservation, Suffolk County, US Fish and Wildlife Service, US Army Corps of Engineers, US Geological Survey, NPS staff, Fire Island communities, and New York Department of State. In addition to monitoring data collected for this effort, Seashore staff, agencies, and physical scientists will also incorporate results from flooding models that are used to evaluate changes related to storm damage risks associated with open and closed breach scenarios.

If and when a decision is reached to close the breach, closure would generally be done as described in the final Breach Plan/EIS under alternative 1 (page 21). Detailed design would be done at that time; therefore, construction may vary according to what is deemed necessary at the time that closure is planned and executed. However, the limits of disturbance for construction are not expected to change from those described in the final Breach Plan/EIS.

If and when a decision is reached to close the breach, a minimum requirement analysis will be completed as necessary regarding the construction activity that will be permitted in the wilderness area.

Mitigation Measures Incorporated into the Selected Action

No mitigation measures are necessary as long as the evolution, growth, and/or closure of the breach is determined by natural barrier island processes. In the event that it becomes necessary to close the breach, the following mitigation measures will be implemented as an integral part of the closure activities:

- Time-of-year restrictions (April 1 to September 1) will be imposed on construction activities for protection of federally and state-listed ground-nesting shorebirds.
- Silt curtains will be used on the bay side of the breach to allow suspended sediment to settle out of the water column in a controlled area, thus minimizing the area that is affected by the increased suspended sediment.
- The use of both tracked and rubber-tired construction equipment is anticipated. Large crane or construction mats composed of timbers or composite material may be deployed on the beach, if needed, to facilitate mobilization of the necessary equipment from the staging area and project site.
- A spill prevention and response plan will be developed to reduce impacts if equipment leaks or hazardous spills occur. The goal of the plan will be to minimize the potential for a spill, contain any spillage to the smallest area possible, and to protect the environment from leaks and spills.
- A construction safety plan will be prepared that addresses appropriate elements to provide for visitor, worker, and park staff safety.
- Grain size of the sand to be deposited on the beach will be the same or slightly larger than the native sand. The sand to be placed on the beach will be consistent with the grain size (minimize/avoid sand larger than the native sand) and color on the naturally occurring beach to the greatest extent practicable.
- Additional mitigation measures may be identified during the preparation of any additional compliance documents that may be applicable; for example, a statement of findings for wetlands and floodplains; a final biological assessment (and formal consultation with US Fish and Wildlife Service, if necessary); and an essential fish

habitat assessment (with further consultation with National Oceanic and Atmospheric Administration-National Marine Fisheries Service, if necessary).

- A programmatic agreement was prepared with stipulations that prior to any ground disturbing activities the National Park Service will conduct an archeological survey program for identification of terrestrial and submerged archeological sites within the project area of potential effect. Prior to affecting any potentially eligible archeological site, the National Park Service will develop a testing program of sufficient intensity to provide an evaluation of eligibility for the National Register of Historic Places in consultation with the New York State Historic Preservation Office (SHPO) and other consulting parties following the regulations outlined in 36 CFR 800.4(c). If, as a result of the testing program, archeological sites are identified within the project area of potential effect that are eligible for the National Register of Historic Places, the National Park Service will develop a plan for their avoidance, protection, or recovery of information in consultation with the SHPO and other consulting parties. The plan will be submitted to the SHPO and other consulting parties for review and comment prior to implementation.

ALTERNATIVES CONSIDERED BUT NOT SELECTED

Alternative 1: Closure Using Mechanical Processes - Under alternative 1, the wilderness breach would be mechanically filled and closed as soon as possible. Sand to fill the wilderness breach would be dredged from the Westhampton Borrow Area, transported to the breach area using a dredge, and systematically placed into the breach using bulldozers and other large earth moving construction vehicles to create the island cross-section.

Alternative 2: Status Determined Entirely by Natural Processes (No-Action Alternative) - Alternative 2 is the no-action alternative. Under alternative 2, the evolution, growth, and/or closure of the breach would be determined by natural barrier island processes only and no human intervention would occur to close the breach or to reopen the breach if it were to close by natural processes.

RATIONALE FOR THE DECISION REACHED

In reaching the decision to select alternative 3 for implementation, the National Park Service considered the potential adverse and beneficial impacts of each alternative as described in the final Breach Plan/EIS and how each alternative aligns with NPS resource management policies, wilderness directives, and the legislation that established the Otis Pike Fire Island High Dune Wilderness.

The National Park Service selected alternative 3 because the selected action:

- Allows the breach to be managed as a naturally evolving barrier island system for as long as possible, retaining all of the wilderness characteristics for which the wilderness area was designated. While the breach functions under natural processes, changes to the

central and eastern Great South Bay ecosystem will continue. Initial results of monitoring since the breach opened indicate that the open breach has generally improved water quality by increasing circulation and reducing eutrophication in the immediate vicinity of the breach. These changes have benefited benthic communities and finfish, improved available fish nursery habitat, and produced a more robust and mature ecosystem.

- Allows for mechanical closure of the breach if the NPS determines, in coordination with its local, state, and federal agency partners, that the breach poses a threat to life and property, which is in keeping with the legislation that established the wilderness. If the breach were to be closed using mechanical methods, the consensus among subject-matter experts is that the bay will eventually revert to the conditions prior to the breach, eliminating the current benefits to the ecosystem. This assumes that all other conditions remain the same as existed prior to Hurricane Sandy.
- Provides a defensible basis for management decisions about the breach by establishing a monitoring program for systematic collection of data about the condition of the breach using scientifically valid criteria as indicators.

ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The Council on Environmental Quality (CEQ) regulations that implement NEPA require federal agencies to identify the environmentally preferable alternative in a Record of Decision (40 CFR 1505.2). The environmentally preferable alternative is the alternative that causes the least damage to biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. (43 CFR 46.30).

The National Park Service determined that alternative 2, described on page 26 of the final Breach Plan/EIS, is the environmentally preferable alternative because it allows natural processes to continue. There would be no manipulation or human intervention of any kind under this alternative, as there would be under alternative 1 and could be under the selected action; therefore, alternative 2 best protects and preserves resources, as well as wilderness character.

CONCLUSION

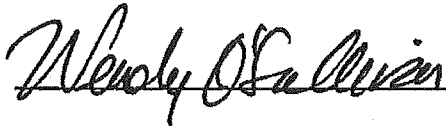
The selected action as described in this ROD best meets the purpose and need of the Fire Island Wilderness Breach Management Plan and for the reasons described, has been selected for implementation. The National Park Service will use the management framework established by the Breach Plan to ensure the continued integrity of the wilderness character; protect the natural and cultural features of the Seashore and its surrounding ecosystems; protect human life; and manage the risk of economic and physical damage to the surrounding areas. As described in “Mitigation Measures Incorporated into the Selected Action” section above, all practical means to avoid or minimize environmental harm from the selected action have been adopted.

*Wilderness Breach Management Plan for Fire Island National Seashore
Record of Decision*

The required 30-day no-action period before approval of the ROD was initiated on December 22, 2017 by the US Environmental Protection Agency's Federal Register Notice of Availability of the final plan/EIS. The no-action period ended on January 22, 2018.

The official responsible for approving this Record of Decision is the NPS Northeast Regional Director. The official responsible for implementation of the selected action is the Superintendent, Fire Island National Seashore.

Recommended



7/12/18

Wendy O'Sullivan, Acting Superintendent
Fire Island National Seashore

Date

Approved



7/23/2018

Gay Vietzke, Regional Director
Northeast Region, National Park Service

Date

Attachment A Non-Impairment Determination

ATTACHMENT A

NON-IMPAIRMENT DETERMINATION

By enacting the National Park Service (NPS) Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of Interior and the National Park Service to manage park units “to conserve the scenery, natural and historic objects, and wild life in the [National Park] System units and to provide for the enjoyment of the scenery, natural and historic objects, and wild life in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (54 USC 100101(a)). Congress reaffirmed this mandate in 1978 by stating that the National Park Service must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which the System units have been established, except as directly and specifically provided by Congress.” (54 USC 100101(b)(2)).

NPS *Management Policies 2006*, Section 1.4.4, explains the prohibition on impairment of park resources and values:

While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The National Park Service has discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of a park (NPS 2006 sec. 1.4.3). However, the National Park Service cannot allow an adverse impact that would constitute impairment of the affected resources and values (NPS 2006 sec. 1.4.3). An action constitutes an impairment when its impacts “harm the integrity of Park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values” (NPS 2006 sec. 1.4.5). To determine impairment, the National Park Service must evaluate “the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts” (NPS 2006 sec. 1.4.5).

This determination on impairment has been prepared for the selected action described in this Record of Decision. An impairment determination is made for resource impact topics analyzed for the selected action; i.e., sediment transport and geomorphology, water quality, ecosystem structure and processes, benthic communities, and finfish and decapod crustaceans. An impairment determination is not made for public health and safety, flooding conditions, and socioeconomics because impairment findings relate to park resources and values, and these impact areas are not generally considered to be park resources or values according to the Organic Act; thus, these cannot be impaired in the same way that an action can impair park resources and values and are not subject to the impairment standard of the Organic Act. Similarly, while

wilderness is subject to its own requirements under the Wilderness Act, it is not itself a park resource or value subject to the impairment standard of the Organic Act, and is not included here.

Under the selected action, natural closure of the breach could occur while the National Park Service is managing it under natural conditions. Although natural closure would eventually reduce the benefits from the flushing of the bay water with ocean water, the process would happen slowly and is part of the natural coastal processes. It is not considered an adverse impact nor would it lead to impairment. Therefore, this non-impairment determination discusses the potential for impairment in the event that a decision is made to mechanically close the breach.

Sediment Transport and Geomorphology

Barrier islands, such as Fire Island, are dynamic and influenced by natural processes. Likewise, the wilderness breach is dynamic, influenced by factors including tidal activity, storm surge, wave action, and winds. Currently, the breach is in equilibrium with few major shifts in profile.

If the breach must be mechanically closed in the future, the selected alternative will result in short-term adverse impacts on sediment transport because of the abrupt alteration of how sediment could be transported in the area of the closed breach. The alteration to sediment transport would be due to the placement of geotextile tubes or sheet piling, placement of additional sand into the system, and release of fine sediments. Mitigation measures, such as the use of silt curtains and using similar grain size, will minimize the impacts of closure on sediment transport. Once closure is complete, sediment transport will return to conditions similar to those present prior to the breach. The elimination of the breach as a conduit will create a lower energy environment, decrease sediment transport on the bay side, allow uninterrupted longshore transport on the ocean side, and reduce or eliminate the localized erosion immediately west of the breach. These conditions could support benthic community and marsh growth on the flood delta in the bay at a faster rate than if the breach closed naturally. Closure of the breach will affect sediment transport and geomorphology, just as the creation of the breach caused changes in how natural processes influenced sediment transport in the area. The changes are small and localized and may be more accurately termed shifts that occur naturally as part of a dynamic barrier beach system, rather than beneficial or adverse impacts. Although construction activities would change the way sediment transport and geomorphology operates in the area of the closed breach, the undeveloped beaches, dunes, and other natural features, as described in the Seashore's enabling legislation, would remain preserved and available for the public to enjoy. For these reasons, implementation of the selected action will not result in impairment to sediment transport and geomorphology.

Water Quality

The water quality of the Great South Bay and surrounding bays is influenced by many factors, including tidal mixing, sedimentation, wave action, and nutrient input. Water quality, in turn, affects aquatic systems, such as wetlands, submerged aquatic vegetation, and benthic and fish communities. Currently, the breach has resulted in changes in physical parameters (increased salinity and decreased temperatures in areas east of the breach), benefits to some aspects of water quality (increased water clarity, increased dissolved oxygen, a reduction in the intensity of brown

tides in areas east of the breach, and reduced nitrogen levels), and adverse impacts on other aspects (increased predation by ocean predator species in the bay).

If the breach must be closed, the selected action will have adverse impacts on water quality because, if other conditions influencing water quality remain the same, mechanical closure of the breach will cause the water quality to revert to conditions similar to those prior to the breach. These impacts could include a decrease in circulation, decreased water clarity, decreased dissolved oxygen, and increase intensities of brown tides east of the wilderness breach. During construction, there will be temporary, localized impacts from the placement of the sand in the breach. These impacts will be avoided or minimized to the extent possible by implementation of mitigation measures. Because the changes to water quality are localized to areas immediately surrounding the breach, these changes are expected to happen quickly, as the mixing of ocean and bay waters will end abruptly with the mechanical closure. Changes in the water quality may result in certain aquatic species moving out of, and other species moving into the area near the closed breach. Although an abrupt change in water quality is not ideal, the bay and marine resources near the closed breach will continue to support aquatic ecosystems and provide marine resources for the public to enjoy similar to those opportunities that were present prior to the creation of the wilderness breach; therefore, implementation of the selected action will not result in impairment to water quality.

Ecosystem Structure and Processes

Evaluating ecosystem maturity is a way to determine the health of an ecosystem. More mature ecosystems are healthier, more stable, and more resilient to disturbance. Attributes of ecosystem maturity include total biomass, species diversity, food web complexity, diversity of feeding relationships, upper trophic level predators, and presence of migratory fish species.

The breach has positively affected the Great South Bay ecosystem east of the wilderness breach; ecosystem maturity has increased in the Great South Bay since the formation of the breach. The breach has created water quality conditions that favor eelgrass and allow recolonization in areas within the influence of the breach, providing refuge habitat for fish and shellfish. The connection between the ocean and the bay has also increased the abundance and diversity of finfish and invertebrates.

If the breach is mechanically closed, there will be temporary adverse impacts from heavy equipment construction noise, pumping and placement of the sand, and increased turbidity. Mitigation measures will reduce impacts; however, mobile species will be driven from the area due to noise and activity and plants and other less mobile aquatic life in the construction area will be affected by the release of fine sediments that will increase turbidity and bury organisms. Once closed, the contribution of the breach to the recovery of ecosystem maturity in Great South Bay would be lost over time, resulting in long-term significant negative impacts, because less mature ecosystems tend to be less healthy, less stable, and less resilient to disturbance. Over time, the conditions of the bay are expected to revert to similar conditions prior to the breach. Specific adverse impacts from a decrease in ecosystem maturity will include decreased finfish abundance and species diversity, lower connectivity to the ocean, and poorer water quality. Because natural processes will continue for an unknown length of time under this alternative, and the trend of increased ecosystem maturity is expected to continue while the breach remains

open, the negative effects of closing the breach will take some time to occur, as a more mature ecosystem is more resilient to changes in the environment. Although certain aquatic species will be lost from the area, other species will move in that prefer a more brackish and low-flow environment, like blue crabs. Bay and ocean ecosystems and processes will still exist, albeit in a different configuration, and current and future visitors will have opportunities to experience and enjoy these resources, similar to what existed prior to the wilderness breach. Therefore, the selected action will not result in impairment of ecosystem structure and processes.

Benthic Communities

Benthic communities include animals (e.g., mussels, clams, polychaetes) living in or on the sediment surface in subtidal and intertidal areas of the Great South Bay. Currently, the breach maintains the more marine, less estuarine benthic community due to saltwater intrusion from the ocean. Increases in salinity, water flow, sediment grain size, and cooler summer water temperatures are currently present in southern Bellport Bay, Narrow Bay, and western Moriches Bay. These changes will continue to spread further from the breach over time, resulting in more changes to benthic communities. Observed shifts in species distributions, such as the shift from blue crab to lady crab, could be related to the salinity change. As salinity increases the community within the area of the Great South Bay may shift to marine dominant species. Hard clams will continue to be both beneficially and adversely affected by the presence of the breach. The increased rate of flushing may improve availability of high quality food resources and provide proper temperatures for reproduction. However, increased predation from marine predators on adult hard clams and from jellyfish and other grazers on hard clam larvae near the breach may have an adverse impact on hard clam populations. To date, there has not been a documented change in the size of hard clam population in Great South Bay.

If the breach must be closed, there will be adverse impacts on benthic communities such as loss of organisms through sand placement and installation of sheet piling or geotextile tubes, and habitat changes to the extent that organisms are unable to reestablish in an area, interfering with feeding for suspension feeders, reducing visibility for visual foraging predators, and reducing reproductive success rates for broadcast spawners. These impacts will be reduced to the extent possible with mitigation measures, including the use of silt curtains. If other conditions influencing water quality remain the same, once the breach is closed, there would be a change from a marine-influenced, benthic dominated system to a more pelagic-dominated system fueled by relatively high nutrient concentrations, similar to what existed prior to the breach. The changes to benthic communities are localized to areas immediately surrounding the breach where water quality is influenced by the exchange of bay and ocean waters. This mixing would end abruptly with the mechanical closure and would result in shifts to the benthic communities that may be more accurately termed changes, rather than beneficial or adverse impacts. Benthic communities will still exist in the bay as part of the larger estuarine ecosystem and provide opportunities for current and future visitors to enjoy the resources through activities such as recreational fishing and shellfishing; therefore, the selected alternative will not result in impairment of this resource.

Finfish and Decapod Crustaceans

Great South Bay is a shallow, well-mixed lagoon ecosystem that supports numerous finfish and decapod crustacean species (e.g., crabs and shrimp). The breach has resulted in an increase in salinity and moderated summertime water temperatures due to an influx of ocean water. The distribution and abundance of aquatic organisms is related to their life-history traits, including optimal salinity and temperature within niche habitat. Since the breach, the abundance of marine species has increased within the bay, and freshwater and brackish water species (e.g., blue crab) have declined, highlighting the shift from freshwater to saltwater habitat. The establishment of eelgrass beds have provided increased nursery habitat for juvenile fish and refugia from predation for juvenile and adult fish. These conditions will continue while the breach remains open and will likely spread as the area influenced by the breach becomes larger with time.

If the breach is mechanically closed, there will be short-term adverse impacts on finfish and decapod crustaceans from turbidity (harm to habitat areas and reduced visibility) and construction noise (concussive forces and shock waves). Most mobile species, such as fish and crabs, will relocate away from the construction site at the onset of construction but return once the activity is complete. To reduce turbidity in the bay, silt curtains will be used to allow suspended sediment to settle out of the water column in a controlled area, minimizing the area that is affected by increased suspended sediment. A closed breach will result in a decrease in abundance for finfish and crustacean species that prefer higher salinities and an increase in abundance of species that require freshwater and brackish water habitats. Overall, there will be a decrease in finfish species abundance and diversity from the decline of eelgrass beds, and an increase in invertebrates in the immediate vicinity of the breach from the decline in fish predation in this area. Because the ecosystem will have matured in the time period prior to closure and a more mature ecosystem is more resilient to change, the regression of the finfish and decapod crustacean communities to conditions similar to those prior to the breach will likely take longer to occur.

Ultimately, the closed breach would result in a less complex food web with fewer trophic links. Mechanically closing the breach will result in adverse impacts to finfish, as abundance and diversity will decrease; however, an estuarine ecosystem will exist similar to other areas of the Great South Bay. Opportunities for current and future visitors to experience and enjoy the estuarine ecosystem will be similar to what existed before the wilderness breach. Therefore, closure of the wilderness breach and the changes to the bay ecosystem will not result in impairment to finfish and decapod crustaceans resources.

CONCLUSION

While the breach remains open, the development of a more marine, less estuarine benthic community in a small part of the Great South Bay ecosystem is likely. NPS engaged a team of coastal ecologists and geologists in developing this plan and these experts agree that this condition is the result of a coastal barrier system experiencing natural processes after a breach.

Under the selected alternative the breach will be allowed to continue to function naturally. Under natural processes, the breach may stay open or may close, as described above.

The plan allows for mechanical closure of the breach in accordance with a special provision in the *Otis Pike Fire Island High Dune Wilderness Act* which states that “wilderness designation shall not preclude the repair of breaches that occur in the wilderness area, in order to prevent loss of life, flooding, and other severe economic and physical damage to the Great South Bay and surrounding areas.” The plan utilizes criteria for monitoring the breach that were specifically developed to indicate conditions under which the breach may be changing in ways that could lead to a decision to close. The plan stipulates that a decision to close the breach using mechanical processes would only be made if the criteria described above were exceeded and additional work between the NPS, its partners, and scientific experts determined closure was necessary to protect life and property. If closure becomes necessary, the coastal experts who assisted with the plan have stated that they expect that the resources will return to the condition documented prior to the creation of the breach. These resources were not in pristine condition at the time of the breach. Thus, while the resources have improved with the breach open, returning the resources to this condition could not be considered impairment as closing the breach would not bring about a condition that is any different than before the breach occurred. Mechanical closure of the breach, if needed, would not prevent the barrier island from functioning under natural processes in the future. After closure is complete, by either natural or mechanical processes, future visitors would still have opportunities to experience and enjoy a barrier island subject to natural processes.

In the professional judgement of the NPS decision-maker, the adverse impacts that may result from implementing the selected action will not rise to levels that would constitute impairment. This determination is based on consideration of the Seashore’s purpose and significance, a thorough analysis of the environmental impacts described in the final Breach Plan/EIS, relevant scientific studies, the comments provided by the public and others, and the professional judgement of the decision-maker guided by the direction of the *NPS Management Policies 2006* (NPS 2006).